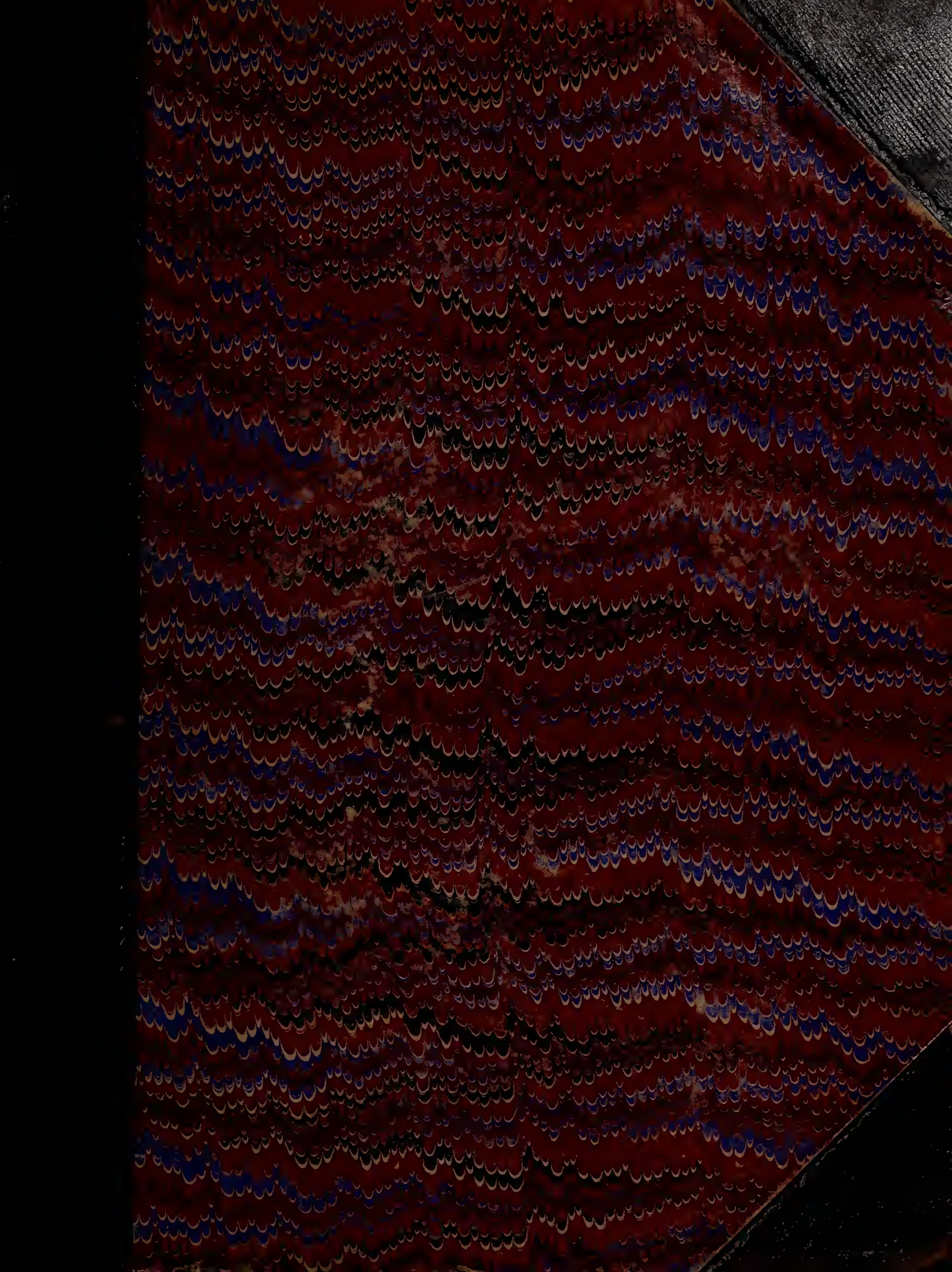

Canadian Railway and Marine World.

GENERAL INDEX

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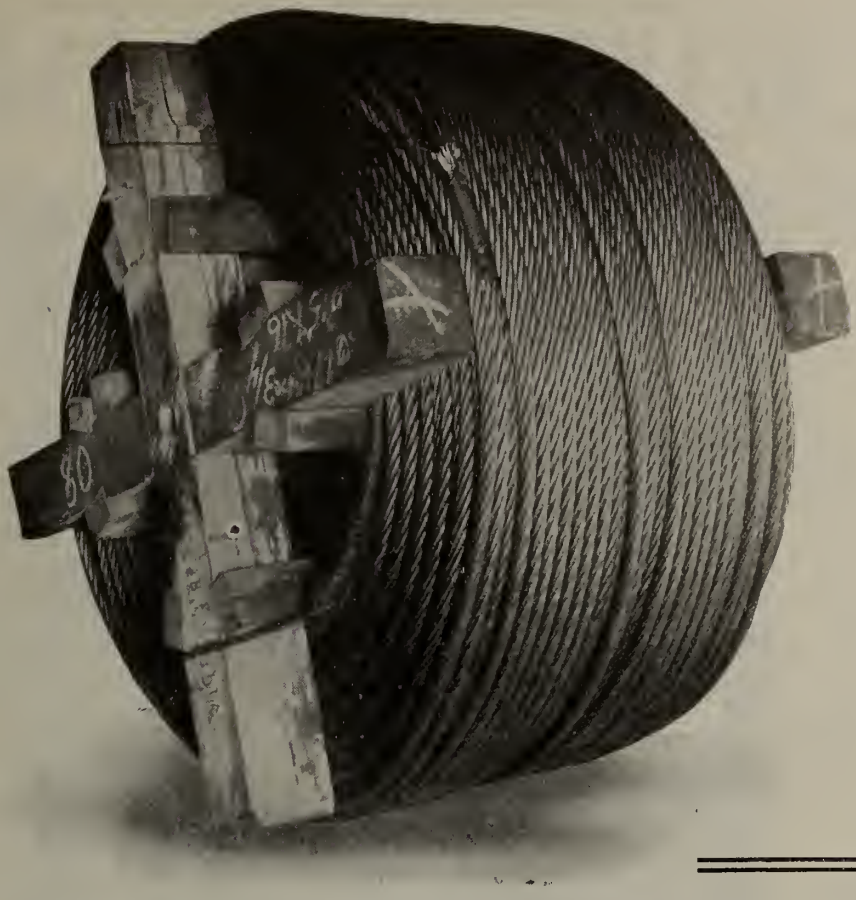

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For Steam and Electric Roads

MANGANESE STEEL CASTINGS For Wearing Parts, insuring Great Hardness and Durability

ELLIPTIC AND COIL SPRINGS OF ALL KINDS, BAR STEEL ANGLES, INTERLOCKING PLANTS, TRUCKS FOR ELECTRIC CARS

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Sole Agents and Manufacturers of the Following Types of Car Couplers:

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Manufacturers of Tee Rails, Fish Plates, Etc.

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Representative for British Columbia : E. A. EARLE & CO., 532 Pender St., West, Vancouver, B.C.

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For Every Class of Service

Pole Brackets and Fittings
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Soldered, Clinch and Mechanical Ears
Splicing Sleeves
Strain Insulators
Feeder Wire Insulators
Trolley Frogs and Crossings
Rail Bonds

Designed to **meet** the most Severe Service. Made of the **Best Materials** and subject to **Thorough Factory Inspection**

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Bolts, Nuts and Washers **Guy Anchors** **Galvanized Strand**
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Derricks must be safe, strong and smooth working. Every little jolt and jar of a heavily loaded derrick produces thousands of pounds of stress on certain parts.

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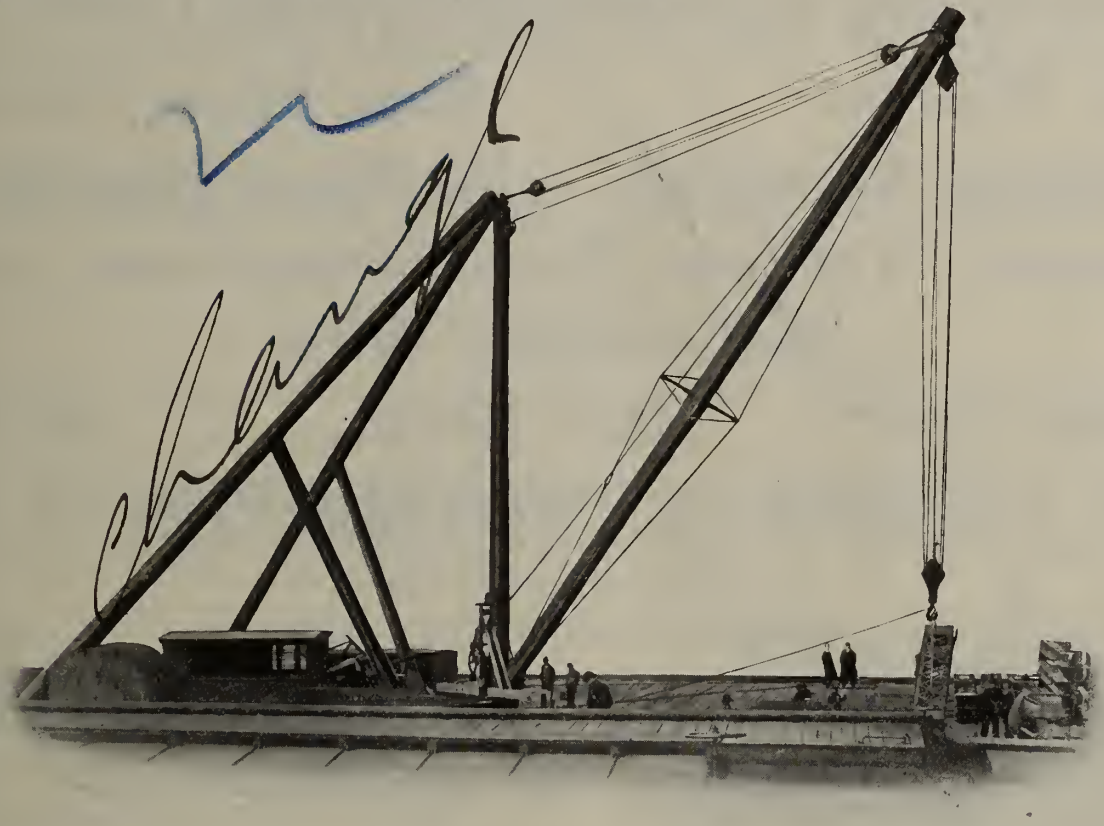
For 30 years have stood the severest shocks and strains, besides being money makers for their owners.



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Type Z left hand

Johnson Car Replacers

Straddles the rail—needs no spikes, clamps or fasteners.
Rests on rail both front and rear.
Adjusts itself to different heights of rail.
Forms a friction grip with rail during the operation.
Brings rails to gauge during replacement.
Distributes the load on the Rail, not one or two ties.
Special types for Steel-ties and Street Car Rails.

The Johnson Wrecking Frog Co.

CLEVELAND, OHIO, U.S.A.
F. H. Hopkins & Co., Montreal, Selling Agents

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¢ a burning hour 100 candle power ¢

Pintsch Mantle Light

THE SAFETY CAR HEATING AND LIGHTING COMPANY

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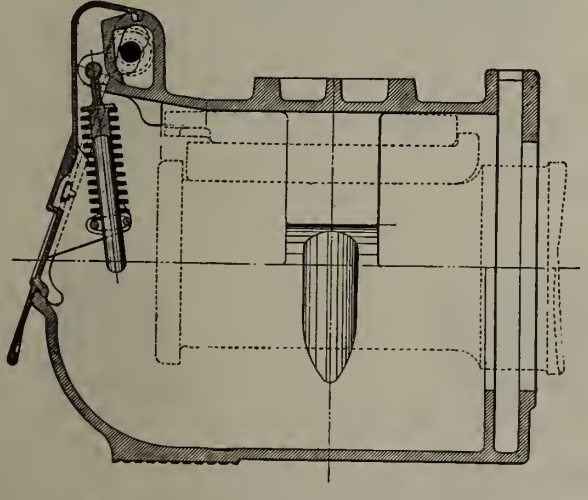

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HIGH SPEED JACKS

They lift and lower their full rated capacity **Four Times** as fast as other Ball Bearing Jacks of equal capacity.

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35 and 50 Tons capacity. Plain and foot lift.

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ADDITIONAL SAFETY AND ECONOMY IN

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has been proved by the use of Continuous, Weber and Wolhaupter base-supported rail joints—after fifteen (15) years' service, having a record of over **50,000 miles in use**—the extent of which is evidence of their excellence. Made in Canada.

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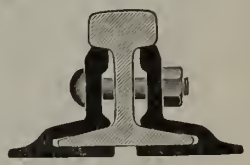
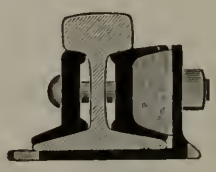


Continuous Joint.

Over 50,000 miles in use.



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Rolled from Best Quality Steel.

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THROUGH TRAINS between BOSTON (via Boston & Maine R.R. and Cent. Vermont Ry.) MONTREAL, TORONTO and CHICAGO.
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The "Railway Greyhound of Canada," the finest and fastest train in the Dominion, runs every day in the year between Montreal and Chicago.

The Lines of this Great System reach all the Principal Cities and Towns in Quebec and Ontario

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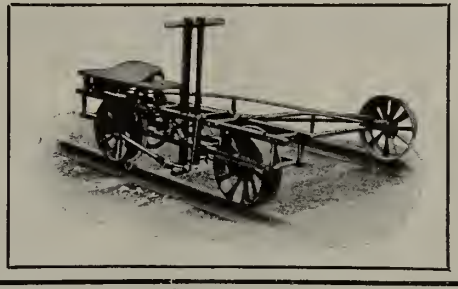

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of all descriptions

Track Tongs, Wrenches, Spike Mauls, Bars, Jacks, Chisels, Rail Saws, Drills, Levels, Gauges, Railbenders, Picks, Shovels, Etc.

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(From Daily Papers)

"Wednesday night B——— forgot to deliver an order to hold Eastbound Passenger Train No. 6, and only the fact that the Electric Headlight of the oncoming Passenger train was seen at a great distance by the Engineer of the Westbound Freight prevented a head end collision in the ——— Canyon near ———. The warning light was seen in time to enable the freight to get back on to the siding at ———."

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Railway and Electric Car Axles, Angle Bar, and Tie Plates, Railway Spikes

Tee Rails 12, 18, and 28 lb. per yard

ALL SIZES BAR STEEL FOR CAR-BUILDERS' USE. Spring, Machinery, Tire, Angles, and Merchant Bar Steel. Heavy Forgings of all Descriptions.

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High in Carbon—Low in Ash. The best Steam Coal for Locomotive, Steamship, and Stationary Boilers.

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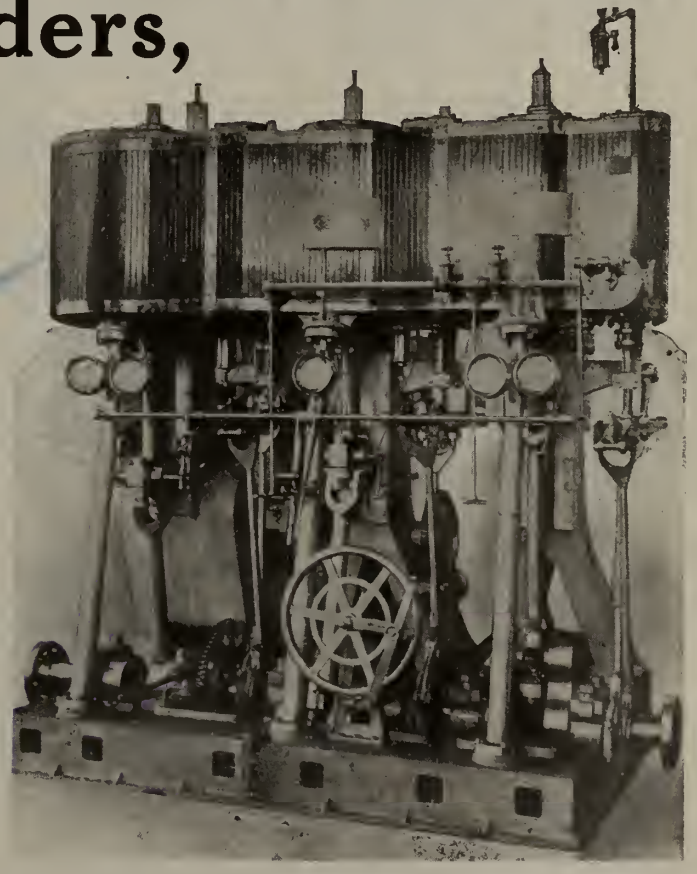

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TATE FLEXIBLE STAYBOLTS

Allow for and Accommodate the Forces of Expansion and Contraction along the lines of Least Resistance

The Tate Bolt can be longitudinally adjusted to compensate for the difference of expansion of Outer Boiler Shell over Fire Box

Over 3,000,000 in service

THE RECOGNIZED STANDARD OF FLEXIBLE STAYS

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Head Office and Works, TORONTO, ONT.

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THE UNEXPECTED DELAY

loses half its worry if you use

THE Northern Electric AND MANUFACTURING CO. LIMITED

Telephone Train Dispatching System

A clear on-the-minute knowledge of what has happened in the case of a breakdown appeals to every railroad man.

The man on the ground can report by the use of the telephone the exact facts directly to the official interested without the intermediary of a third party.

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Automatic Signals prevent collisions, increase track capacity and delay double tracking single track lines. They are not only a good insurance, but a good investment.

The Hall Signal Company manufactures exclusively automatic signal apparatus, and its reputation is based on the quality of the apparatus produced. The Company is prepared to furnish plans and estimates for signaling any section of track, however simple or complicated, and takes this opportunity to offer the services of its engineers to the Railroads of Canada.

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Fig. 184—A

All Sizes in

Screwed, Flanged and Hub End

With Inside Screw or Outside Screw and Yoke

Made with Bronze Fittings throughout, either with Bronze Seats or Hard White Metal Renewable Seats

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TORONTO AND TRENTON NEW LINE--NOW OPEN

Effective Monday, Oct. 9, 1911

CONDENSED TIME TABLE

Eastbound—Read down.			Westbound—Read up.	
No. 10	No. 8		No. 7	No. 9
P.M.	A.M.	STATIONS.	P.M.	P.M.
6.30	9.30	.... TORONTO	1.00	9.30
9.00	12.00	.... Port Hope	10.30	7.00
9.15	12.15	..... Cob urg	10.15	6.45
9.43	12.43	..... Colborne	9.47	6.17
10.00	1.00	..... Brighton	9.30	6.00
10.20	1.20	.... TRENTON	9.10	5.40
P.M.	P.M.		A.M.	P.M.

For Time at Intermediate Points, See Time Tables

Trains run daily, Sunday excepted. Solid, Wide, Vestibuled Trains.

Dining Car Service

Toronto to Trenton, on Train No. 8. Trenton to Toronto, on Train No. 9.

Parlor Cars On All Trains

Trains run from and to Union Station, Toronto. Union Station with Central Ontario Railway is located in centre of Tow of Trenton. All Central Ontario Railway Trains make close connections at Trenton Union Stati n with above trains.

GEO. H. SHAW, General Traffic Manager, Toronto, Ont.

R. L. FAIRBAIRN, Asst. Genl. Pass. Agent, Toronto, Ont.

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MONTREAL-QUEBEC TO BRISTOL
(Summer Service)

HALIFAX TO BRISTOL
(Winter Service)

ROYAL GEORGE AND ROYAL EDWARD

Their equipment and interior appointments are of the most luxurious and modern description, and all the conveniences and comforts that make for an enjoyable voyage have been thoroughly anticipated. Marconi wireless, deep sea telephones, passenger elevators, thermo-tank system of ventilation, superbly appointed cabins.

For full particulars apply to the nearest Railway or Steamship Agent.

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For Emergency Service

With a Fairbanks-Morse Motor Car, in your equipment, it is possible to start out a gang of men on an instant's notice.

They are also valuable for use on regular section work, increasing the territory covered by each gang with a saving in time and energy. Your men start to work fresh and do a hard day's work, for they can ride home without any further effort on their part.

Twenty minutes daily will keep the Fairbanks-Morse Gasoline Engine in first-class condition.

Send for descriptive bulletin.

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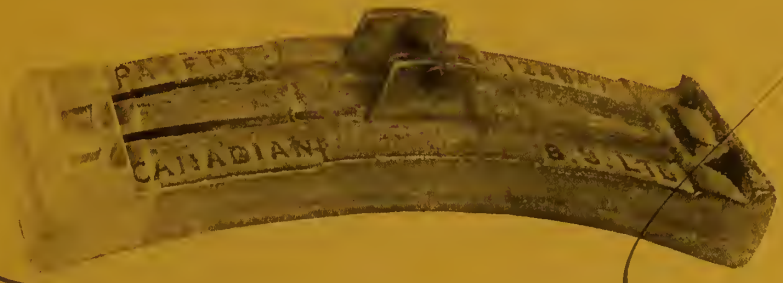
Montreal Ottawa Toronto St. John, N.B. Winnipeg Saskatoon Calgary Vancouver



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In Copper, Aluminium and Iron

Rolled and Drawn Sections in Copper, Aluminium and Brass
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PASSENGER FREIGHT AND ELECTRIC RAILWAY
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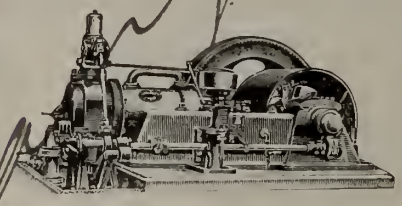

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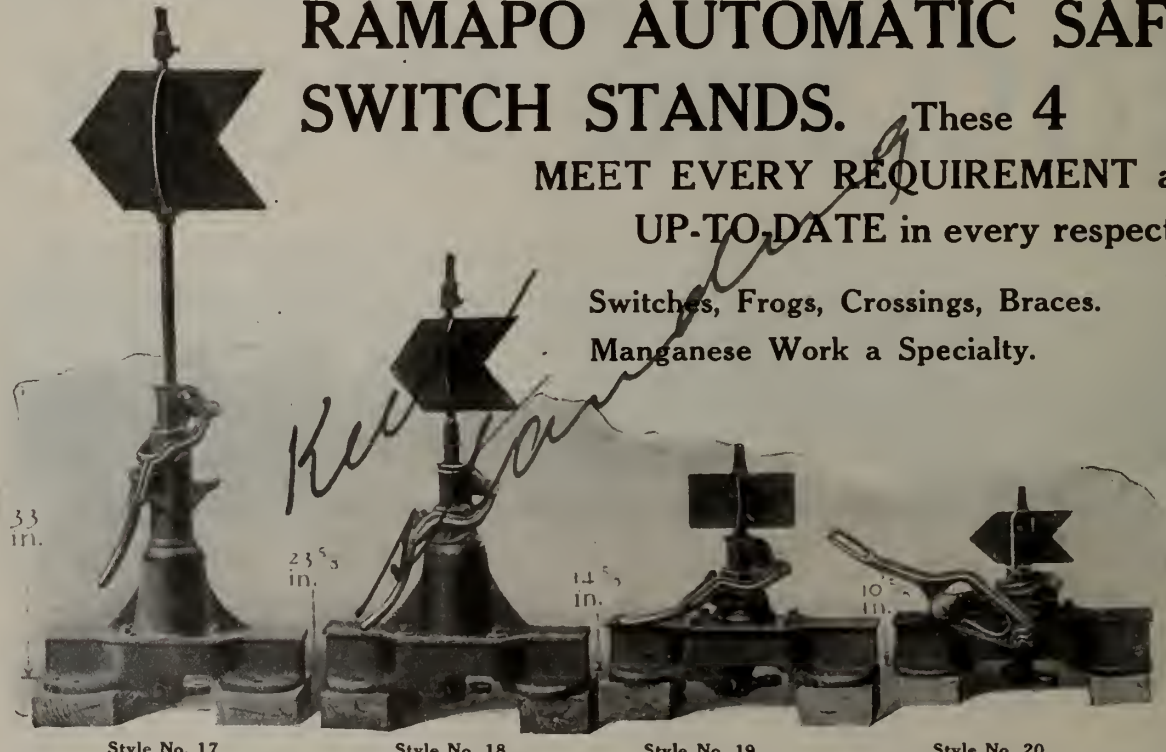
MEET EVERY REQUIREMENT and are UP-TO-DATE in every respect.

Switches, Frogs, Crossings, Braces.
Manganese Work a Specialty.



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WORKS NIAGARA FALLS, ONT.

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DEALERS IN

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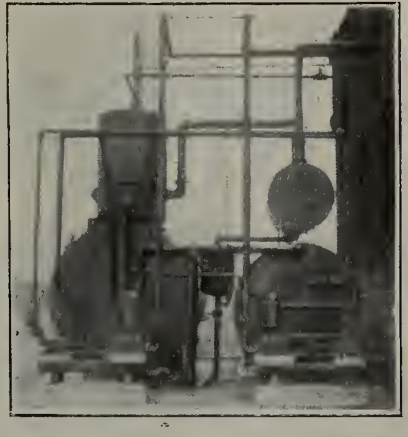
We have a complete list of Second-hand Machinery.

For prices and other particulars write to head office

45 and 46 Canada Life Building, - WINNIPEG, MANITOBA

"NATIONAL"

We are installers of the latest and most up-to-date Automatic Boiler Washing Plants for Railroad use.



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We are installers of all classes of heating systems in Roundhouses, Machine Shops and Industrial Plants.

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The train leaves as follows:

Leave North Parkdale - - -	9.15 p.m.	Arrive Ottawa, 6.50 a.m.
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¶ The equipment is "Canadian Pacific Standard," a synonym for the "best" and attentive porters, ensure efficient service.

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SIMPLE and COMPOUND adapted to every variety of service

CANADIAN LOCOMOTIVE CO., Ltd.

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Mechanics are particular and will continue to use a make of file they have found to give the best results. The Nicholson File Company adopted and adhered to the policy of making the best file possible.

The result of this policy is that their business has increased from 100 dozen a day sold in a local market in 1864 to 16,000 dozen a day sold all over the world, and Nicholson-made Files are recognized as the standard wherever files are used.

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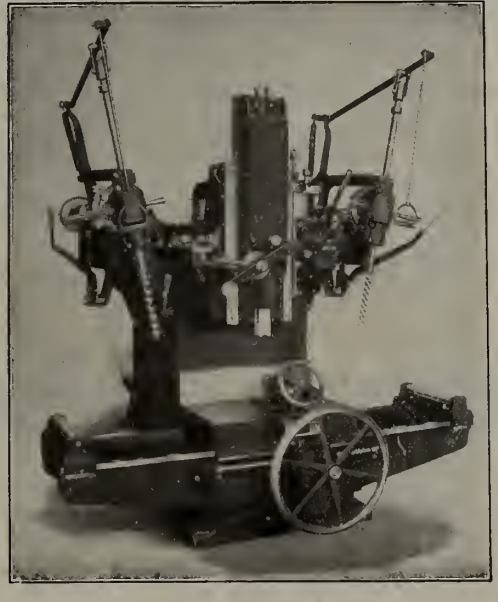
ROCKFORD, ILL.

SPECIALISTS IN

CAR SHOP MACHINERY



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Maximum Economy OF Production Guaranteed

MODERN DESIGNS FOR MOTOR CONNECTION

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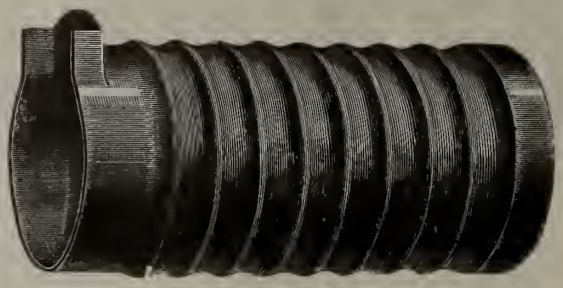
The Universally satisfactory record of "THE MORISON" proclaims it the best furnace made.

With Plain Ends or Flanged to any required shape.



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Uniform Thickness, Easily Cleaned, Unexcelled for Strength, Unsurpassed for Steaming Capacity.

Manufactured by

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Send us your specifications for special Taps.
We have the appliances.
Delivery and price will please you.

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If you are interested in Wheel Flange Lubricators for your Locomotive, write us and we will send you full particulars of the latest device which we are placing upon the market.

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Car Lighting Equipment and
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Efficient and economical operation is a consideration which leads to the adaptation of the "Bliss System."

"National" Storage Batteries for Car Lighting or Railway Signal Service give the best service at the lowest cost.

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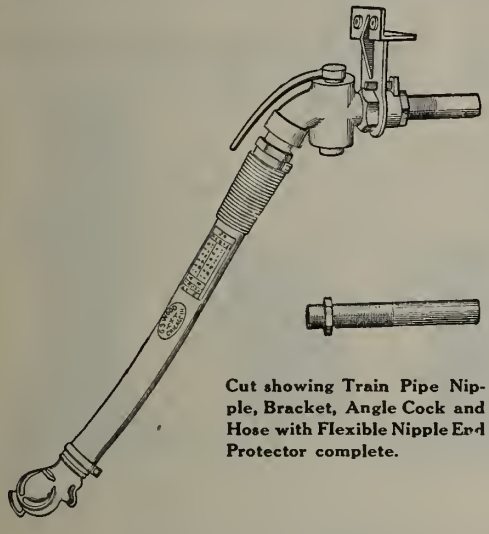

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Cast Iron Water and Gas Pipe, Specials
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H & E Patent Ball-Bearing Lifting Jacks

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For Convenience, Speed and General Efficiency these Jacks are Unequalled. Are fully guaranteed. Being made of the best grades of Malleable Iron and Steel are strong and durable. Working parts entirely protected insure long wearing qualities. Sizes from 8 to 50 tons now complete. Send for prices and discounts.

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A Merry Christmas and a Happy New Year

is the wish we extend to our many friends and customers. We take this opportunity of thanking you for the courtesies extended to us during the year just ended, and trust to be favored with a continuance of your good will and patronage for the coming year. We hope it will be the brightest and most prosperous year in your history.

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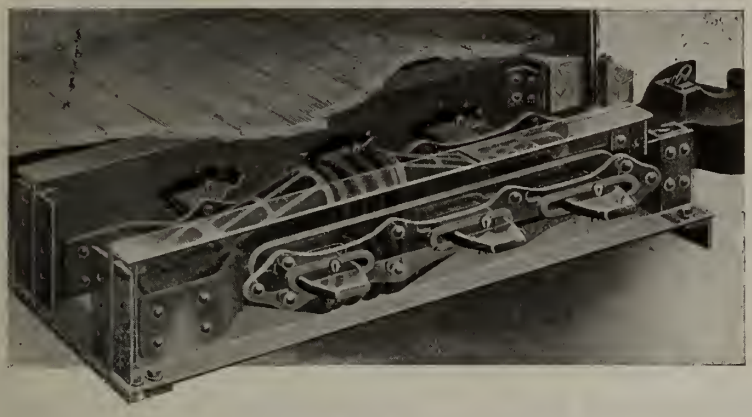
No Yokes, Yoke Rivets or Follower Plates



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Any Friction Device May Be Used in Combination with FARLOW Attachments.

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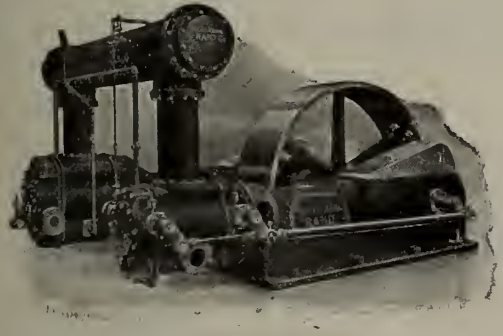

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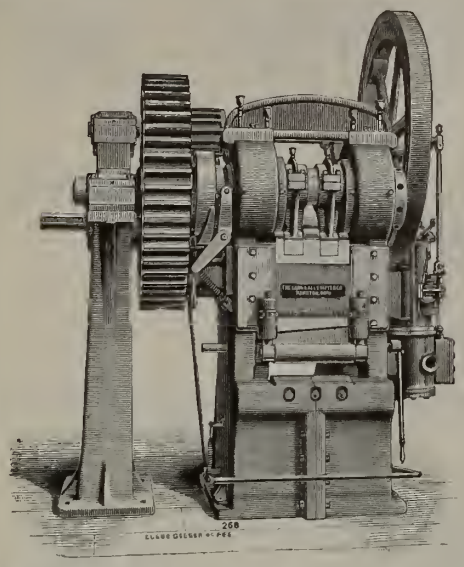

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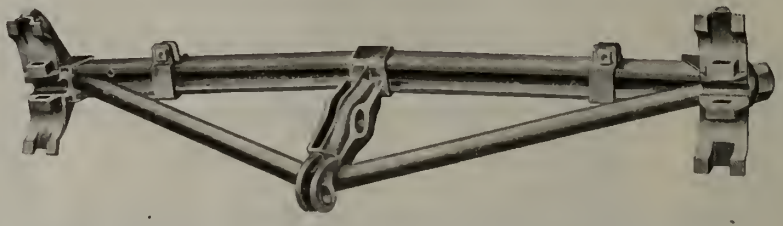

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LOCOMOTIVE, TENDER AND PASSENGER CAR SPRINGS of every description.
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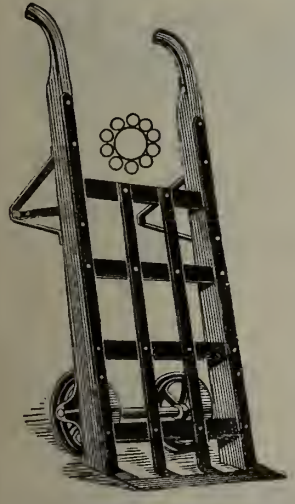

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The Roller Bearings reduce friction to a minimum, thereby **Doubling** the **Life** of the **Truck.**

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Dearborn Treatment Overcomes All Bad Water Troubles

Because Scientifically Prepared to Suit Water Conditions

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Gallon samples of the waters are required for analysis. When reports are completed, we are ready to prepare treatment, and will send an expert engineer to instruct in the proper handling of the material.

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The Best Lubricant for Your Machinery is

Helmet OIL

A Solidified Oil—The Consistency of Butter

ABSOLUTELY PURE NO LIME NO SOAP NO ROSIN NO ACID

Used in all Climates and Seasons.
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THE BEST FOR FIFTY YEARS—NOTHING ELSE LIKE IT.
INSIST ON THE GENUINE.

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Largest Manufacturers in the World of Car Heating Apparatus

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The Twentieth Century Hotel **Absolutely Fireproof**

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THE ROYAL LINE SS. "ROYAL GEORGE"

"At your request for a recommendation with reference to Blau-gas, I would say that we have used your Blau-gas and Oxygen for cutting out rivets and plates and have found it extremely satisfactory. It is much quicker than any other method of cutting I have seen used, also it can be used in places where hand work is impossible. I have much pleasure in recommending it to anyone requiring expeditious work of this kind."

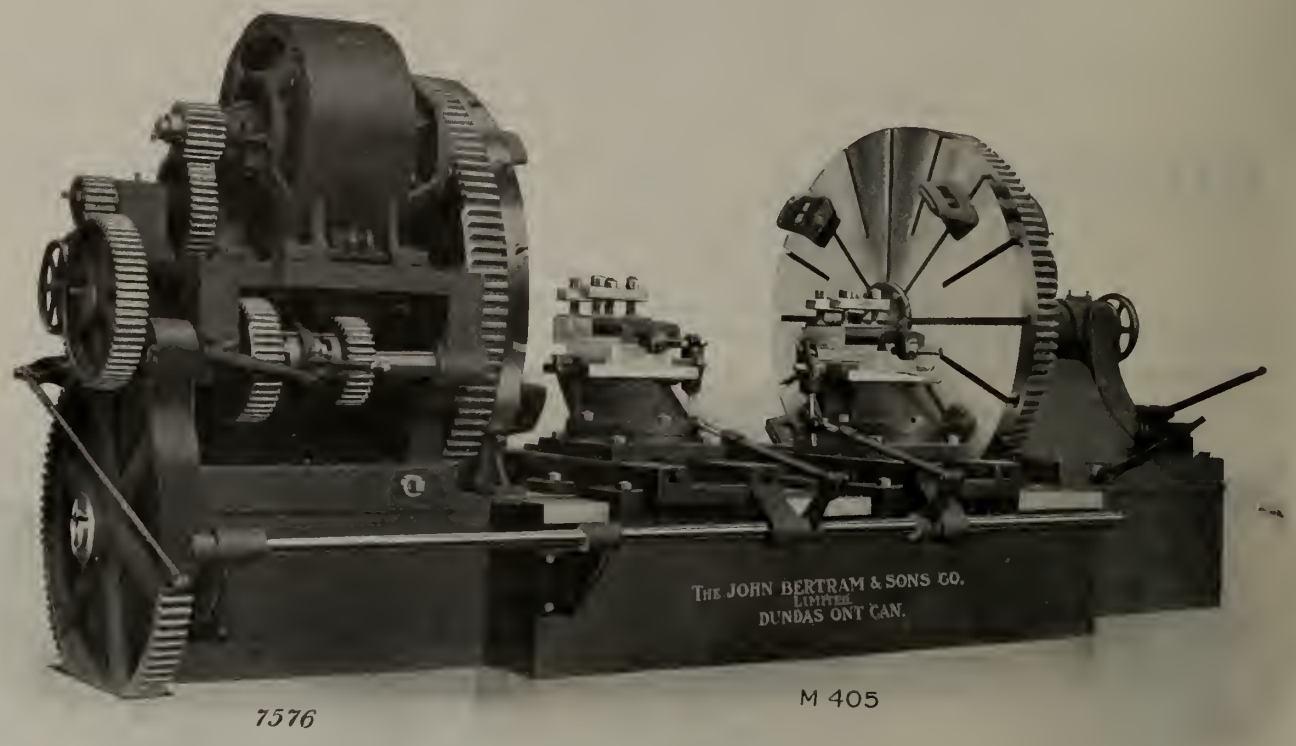
THOS. DAVIDSON MFG. CO., MONTREAL

"We have your favor of the 31st ult., and beg to say that we have tested the boiler you welded for us, and found it perfect."

THE BLAU-GAS COMPANY OF CANADA, LIMITED

27 McGILL COLLEGE AVE., - - - - MONTREAL.

LOCOMOTIVE AND CAR SHOP MACHINERY



80-inch Double Driving Wheel Lathe
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We install complete equipments for Machine Shops, also Locomotive and Car Shops.

Write for particulars.

The John Bertram & Sons Co.

Limited

DUNDAS, ONTARIO, CANADA

Sales Agents: The Canadian Fairbanks Co., Limited

See Purchasing Agents Guide on page 51

See Alphabetical Index to Advertisements on page 58

The Railway and Marine World

January, 1912.

PIECE WORK PRICE SETTING AT THE C.P.R. ANGUS SHOPS.

By Frederick H. Moody.

Scientific management—what does it mean? This is a question constantly recurring in every line of endeavor, modern conditions of keen competition making it absolutely imperative that production costs be reduced to a minimum. Judging by the number of times the subject has been broached to the writer on the occasion of his visits to different shops in both Canada and the United States, the question is becoming one of most vital importance, holding the attention of both management and employe—both looking upon it from a different angle, and, in a great many cases, both have the wrong angular viewpoint, attempting to establish a line of reasoning from a single instance instead of from a chain of established facts.

Railway shops are among the most interested of the many investigators of the principles of scientific management. For several years the C.P.R. management, which has always been well in the van in experimental work, had been trying to improve its methods of shop production, the attempts being entirely by its own local men, and consequently savoring of the systems previously in use at the shops. It was, therefore, decided that it would be advisable to bring in experts to analyse conditions and prescribe the necessary remedies for rectifying conditions.

In June, 1909, Dodge, Day and Zimmerman, of Philadelphia, Pa., a firm of "industrial doctors" or contracting engineers, were called in to make a report on the plant, their particular duties being to analyse the plant and its equipment and make suggestions where conditions might be advantageously improved. This firm requisitioned the services of H. L. Gantt, industrial engineer, who made a report on the plant. His suggestions, however, were more general than particular, striking at the underlying principles rather than at concrete examples of where work might be improved. Among his suggestions were recommendations for an adherence to standard forms for cutting tools and a partial rearrangement of the shops with respect to the installation of a schedule system for the directing of the product through the plant and a reorganization of the piece work deparument.

Following the completion of Dodge, Day and Zimmerman's report, Mr. Gantt's services were retained by the C.P.R. for upwards of a year in the capacity of a consulting engineer. The most important of the suggestions he offered during this period was that of adapting the Taylor system of instruction cards for piece work pricing. This suggestion was followed, with the exception that the system in its entirety was not introduced, various modifications being made to meet the local conditions existing at the works. These conditions are necessarily different from any for which the Taylor system was originally planned, as in such a plant as the Angus shops, not only is new work handled, but also a lot of repair work, and work that will never be duplicated or produced in large quantities.

The System.

The system, as originally introduced, has been still further modified from time to time with the idea of bringing it more nearly to a state of perfection. With the guidance of Warren B. Hood, General Shop Inspector, under whose direction this piece work rate setting comes, and by whose efforts the system has been made to prosper, most satisfactory results have been obtained.

P245 J. M. R. Fairbairn,
Assistant Chief Engineer, Canadian Pacific Railway Eastern Lines.

As demonstrative of the operation of the system, consider a specific case. One of the department foremen desires to have a piece-work price set for the operation of drilling the cylinder and casing stud holes in the front cylinder cover. The foreman fills in the blank shown in fig. 1, which is addressed to the Chief Piece Work Inspector, this form giving date, name of part, details of necessary operations, list number, drawing number, classes of engines on which this same operation is necessary, machine number, engine number (if special piece), number of pieces, store order, material, operator's name and rate, and remarks. This latter usually calls for two separate prices, the price for the first piece, which includes setting up the machine, and a price for all subsequent pieces.

In the locomotive machine shop there are two shop demonstrators whose duty it is to set the price. It is at this point that the system differs essentially from many methods of setting piece-work prices, actual practice under normal conditions being those selected for a basis of computing the price allowance. This is in marked contradistinction to arbitrary, theoretical price-setting as followed in many places.

To one of these shop demonstrators, the foreman's requisition for piece-work price is given by the shop inspector. As will be noted on the requisition form, fig. 1, the foreman states the machine on which he desires the piece to be produced, and the mechanic to operate that machine. This is all the information on which the shop demonstrator has to work. Following the receipt of his notification, an actual demonstration on this piece is performed on the machine defined, the operator doing the work himself. The duty of the shop demonstrator is to bring in any refinements of operation that will increase the rapidity of production. He works with the men, but does not do the work for them.

The machine being in readiness, the shop demonstrator observes the operator set up the machine for the necessary operation. During this setting up, the shop demonstrator makes such suggestions as his experience dictates. The time of this operation is kept. The time of setting up the piece preparatory to drilling is noted. as is also the time of drilling the holes. Meanwhile, the shop demonstrator makes suggestions relative to the tool to use, feed, and spindle speed the operator being required to follow the instructions given. As previously mentioned. all the actual work is performed by the operator, the shop demonstrator merely making suggestions and timing. Several such tests are made, the duration of the different operations being noted in each case. These notations are made on an instruction card somewhat similar to the one, the front and reverse sides of which are shown in figs. 3 and 4. In the card as made up in the shop the sketch and data are roughly pencilled in.

Referring to fig. 4, it will be noted that the actual operating time, exclusive of preparations, is 27 minutes, or 0.45 hour. This being for one man only, gives a time of 0.45 man-hours per piece. The total time, including time of preparing machine, is 42 minutes, or 0.70 hour. These are actual times.

It stands to reason, however, that an operator could not keep up this demonstration speed for 10 hours every day, as this period is actual operating time, under normally good conditions, no allowance being made for the usual run

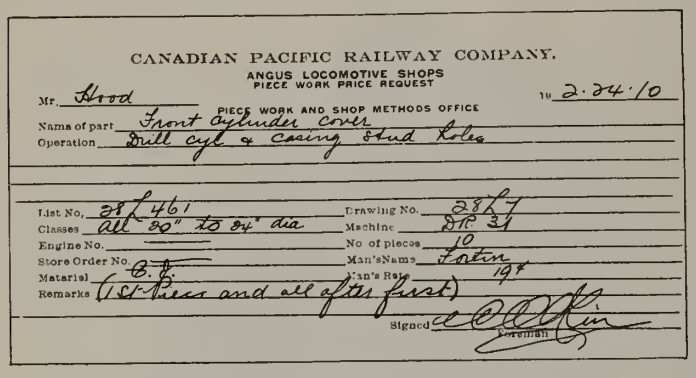
of minor mishaps. Where a mishap does occur while a job is being performed, that demonstration is not considered; only good performances are kept for price setting. This basis is taken so as to produce an absolutely fair basis of computation.

The question of making an equitable allowance for minor casualties absorbed the attention of the organizers of this system for some time after its institution. At first, a straight 25% of the actual demonstrations operating time was added to give the pay equivalent allowance, or actual time allowed the operator to produce the piece, this 25% being the allowance for all casualties. It was found after the system had been operating some little time, that this did not give a fair basis of reimbursement for lost time. For some operations it was too great an allowance, but in the majority of cases this amount was not sufficiently large. For the most part, the allowance has had to be increased.

This introduced a more complicated condition—the scheduling of different allowances for different classes of work. It was realized that an operator's dexterity and skilfulness on a job increased in proportion to the way in which the number of pieces and number of operations increased. Consequently, more allowance had to be made for the failure of the human factor under long-continued periods of working. Hence, as the number of operations per hour increased, a greater allowance was given to the actual time to determine the rate on which to set the pay.

The method of determining these differences for all conditions is most interesting and instructive, but is too elaborate a scheme to be considered in detail. Briefly, actual test conditions were experimented upon, the actual production for a ten-hour day being compared with that figured for a similar period working at the original demonstration rate. The difference gave the basis for making the allowances. These tests, being made for a great number of cases covering all conditions, gave sufficient points from which straight line allowance curves could be plotted, the abscissas representing operations per hour and the ordinates, percentage allowances. Parallel diagonal lines on this field represent pieces per hour. These curves give a ready means of computing for nearly all conditions.

Coming back to the case in hand, and referring to fig. 3 again, it will be noticed that the actual demonstration time was 0.45 hour. For these conditions from the allowance curves the addition to be made was found to be 30%, which is 0.13 hour, or a total pay equivalent time for each piece of 0.58 hour. For the first piece, which includes setting up, the same allowance of 0.13 hour is made, which, added to the 0.70 hour demonstration time, gives 0.83 hour as the pay equivalent. This card, figs. 3 and 4, gives all the detailed instructions of the job, no reference being made to

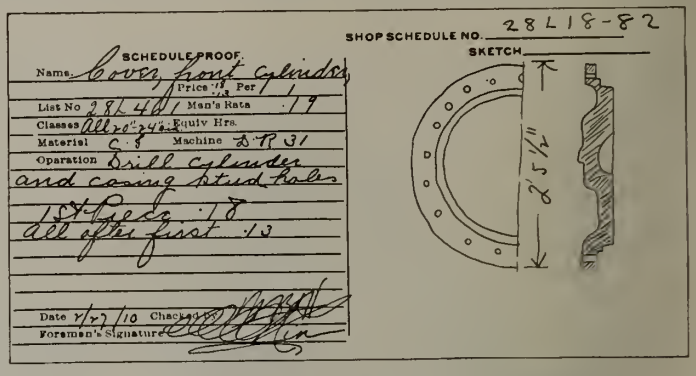


CANADIAN PACIFIC RAILWAY COMPANY.
ANGUS LOCOMOTIVE SHOPS
PIECE WORK PRICE REQUEST

Mr. Hood — 19 2.24.10
PIECE WORK AND SHOP METHODS OFFICE
Name of part Front cylinder cover
Operation Drill cyl & casing Stud holes

List No. 28 L 461 — Drawing No. 28 L 7
Classes all 20" to 24" dia — Machine DR 31
Engine No. — No. of pieces 10
Store Order No. — Man's Name Foster
Material C. I. — Man's No. 194
Remarks (1st Piece and all after first)
Signed — Foreman

Fig. 1. Piece Work Request Slip.



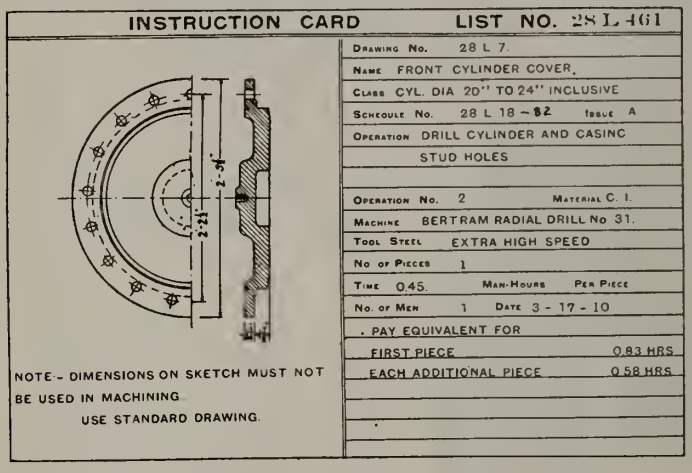
SHOP SCHEDULE NO. 28 L 18-82
SCHEDULE PROOF
Name Cover, front Cylinder
Price 1/3 Per 1
List No 28 L 461 Man's Rate .17
Classes All 20" to 24" Equiv Hrs.
Material C. I. Machine D.R 31
Operation Drill Cylinder and casing Stud holes
1st Piece .78
all after first .13
Date 1/17/10 Checked
Foreman's Signature
SKETCH
2'-5 1/2"

Fig. 2. Reverse Side of Piece Work Request Slip.

such a collection of instruction cards are manifold. What is probably the most important function from a repair shop standpoint, is the fact that the exact period of time required to produce being known, the locomotive on which repairs are being made can be promised with a much greater certainty of delivery on the scheduled date, and confusion is largely eliminated.

This system has a further advantage in encouraging the foremen to better performances in their respective departments, each foreman being held responsible for all irregularities that occur in the carrying out of the schedule. It has been found an excellent incentive towards increased production.

From the workman's standpoint it is a system to be commended. It is not a slave-driving system like many piece-work plans, but, instead, co-operates with the man, showing him how to produce the maximum possible output, with a minimum of labor. It is for this reason that the positions of shop demonstrators are maintained. These men, experts in machine shop production, know how any machine can be made to operate to the best advantage, selecting the best tools for the purpose, as noted on the shop instruction sheet, and at the same time giving the man suggestions that will enable him to increase his out-



INSTRUCTION CARD — LIST NO. 28 L 461

NOTE - DIMENSIONS ON SKETCH MUST NOT BE USED IN MACHINING
USE STANDARD DRAWING.

Drawing No.	28 L 7
Name	FRONT CYLINDER COVER.
Class	CYL. DIA 20" TO 24" INCLUSIVE
Schedule No.	28 L 18 - 82 Issue A
Operation	DRILL CYLINDER AND CASING STUD HOLES
Operation No.	2 Material C. I.
Machine	BERTRAM RADIAL DRILL No 31.
Tool Steel	EXTRA HIGH SPEED
No. of Pieces	1
Time	0.45. Man-Hours Per Piece
No. of Men	1 Date 3 - 17 - 10
PAY EQUIVALENT FOR	
FIRST PIECE	0.83 HRS
EACH ADDITIONAL PIECE	0.58 HRS

Fig. 3. Instruction Card for the Piece Operated On.

DETAILED INSTRUCTIONS	Tool Used	Diam. of Drill	Feed in Inches Per Min.	Spindle Speed	Minutes Allowed
PREPARE MACHINE FOR 1st. PIECE, GET DRILLS AND JIG.					15 0
1. SET UP AND CLAMP JIG					4 0
2. SET DRILL					1. 0
3. DRILL 17 CYLINDER STUD HOLES	D D F	1 1-8	2 3-4	225	17 0
4. CHANGE DRILL					1. 0
5. DRILL CASING STUD HOLE	D D F	25-32	2 3-4	225	1. 0
6. REMOVE					3. 0
S. D ANGUS SHOP C P. R			TOTAL MINUTES		27. 0
			TOTAL HOURS PER PIECE		.45

Fig. 4. Reverse Side of Instruction Card.

Instruction Cards.

Up to this point, however, the card, figs. 3 and 4, is in rough pencil form with freehand sketch, as left by the shop demonstrator. When filled in to this point it is handed over to the general shop inspector. If the piece should be a cylinder or similar job that could only be machined at the Angus or Winnipeg shops, only three or four typewritten copies would be made up for distribution to the interested foremen and superintendents at these two points. Where the piece to be machined is small, such as the cylinder cover under consideration—a piece that might be made at any one of the small machine shops at the roundhouses throughout the system—printed copies are made up in batches of 25, 50 or 100, as desired, for widespread distribution. An apprentice makes all the necessary sketches for the zinc cuts, this having the advantage of giving the apprentice good draughting experience.

These instruction cards, as they are called, form the basis of the piece-work system. They are preserved as a permanent record for all future reference purposes. The advantages of having

put. It will be noticed that the system is aimed more at working the machines to their best advantage with a resulting saving in the exertion of the workman, and his consequent improved condition to maintain his efficiency throughout the full day. Where a man fails to keep up to the standard set, the foreman knows at once that something must be wrong with the manner in which the operations are being performed, and therefore requisitions the services of the shop demonstrator to watch the operator and discover wherein the fault lies. The shop demonstrator can thus make the necessary suggestions to bring the article being produced up to the standard predetermined time period. It can thus be seen that the system is in the best interests of both employer and employe.

As mentioned, standard tools are employed, these tools being noted on the shop instruction cards. The shapes of tools are those laid down by Frederick W. Taylor in Dec., 1906, in the wonderful paper "On the Art of Cutting Metals," presented as his address when retiring from the presidency of the American Society of Mechanical Engineers. Tools best adapted for all conditions were treated by him in that address, the tools being designated by various combinations of letters. These tools were the result of years of experimental work on metal working at the plant of the Bethlehem Steel Co., of which he was Chief Engineer. A specialty of this work is being developed by the Tabor Mfg.. Co., Philadelphia. At the Angus shops, cast iron models of the tools have been made up for distribution to the different tool grinders who put the tools in shape for the workmen. Standard tools are thus available at all times, making duplication of original operating conditions readily possible.

After the shop demonstrators have set their figure for the piece for which the original piece work price request slip, fig. 1, had been issued, the essential information regarding the results of the price setting performance is jotted down on the reverse side of the piece work request slip, as in fig. 2. This, on being checked by the shop demonstrator, is returned to the foreman, requesting the piece work price, for his signature, thereby signifying that he considers the price set and conditions to be quite equitable.

PIECE WORK PRICE CARDS.

After the shop instruction sheets have been made up the piece work price setter adds his contribution to the steps of the system by making out price cards such as those shown in figs. 5 and 6. Both cards refer to the same piece, the one in fig. 5 referring to the first piece of a batch only, while that in fig. 6 is based on the time required after deducting the time of setting up, etc., incidental to the first piece. These piece work price cards, like the shop instruction sheets, are filed for checking the men's time slips.

This, briefly, is the piece work price setting system in operation at the C.P.R. Angus shops. It is a system to be highly commended, and reflects credit on the organizers. To many it may appear theoretical and unpractical, and to some of the men in the shop it will possibly savor too much of anti-unionism, but "the proof of the pudding is in the eating," and as the "eating" in this case has proved manifestly pleasant, it would appear to be a material advance on the majority of systems of price setting.

4-4-11-17603

EAST MACHINE SHOP SCHEDULE No. 28L 18

Name	Cover, front cylinder,	Price .18	Per 1
List No.	28L 461.	Gang or Man	Rate .21
Classes	All 20" to 24" dia inclusive.	Equiv. Hours	
Material	C. I.	Machine	D.R. 31.
Operation	Drill cylinder and casing stud holes.		
	NOTE:- First piece only.		
Date	4/3/11. 5/10.	Approved	S. L. S.
	P. W. I.		A. S. M. P

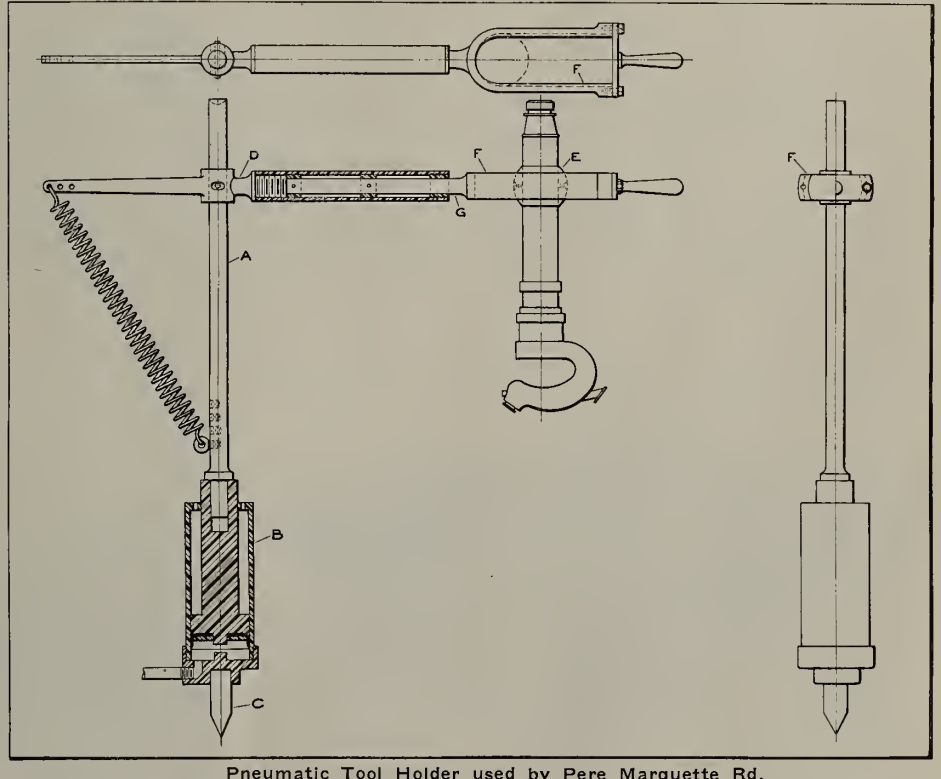
Fig. 5. Piece Work Card for the First Piece.

4-4-11-17603

EAST MACHINE: SHOP SCHEDULE No. 28L 82

Name	Cover, front cylinder,	Price .13	Per 1
List No.	28L 461.	Gang or Man	Rate .21
Classes	All 20" to 24" dia inclusive.	Equiv. Hours	
Material	C. I.	Machine	D.R. 31.
Operation	Drill cylinder and casing stud holes.		
	NOTE:- All pieces after first.		
Date	4/12/11. 3/11.	Approved	S. L. S
	P. W. I.		A. S. M. P.

Fig. 6. Piece Work Card for All after First Piece.



Pneumatic Tool Holder used by Pere Marquette Rd.

Pneumatic Tool Holder Used by the Pere Marquette Rd.

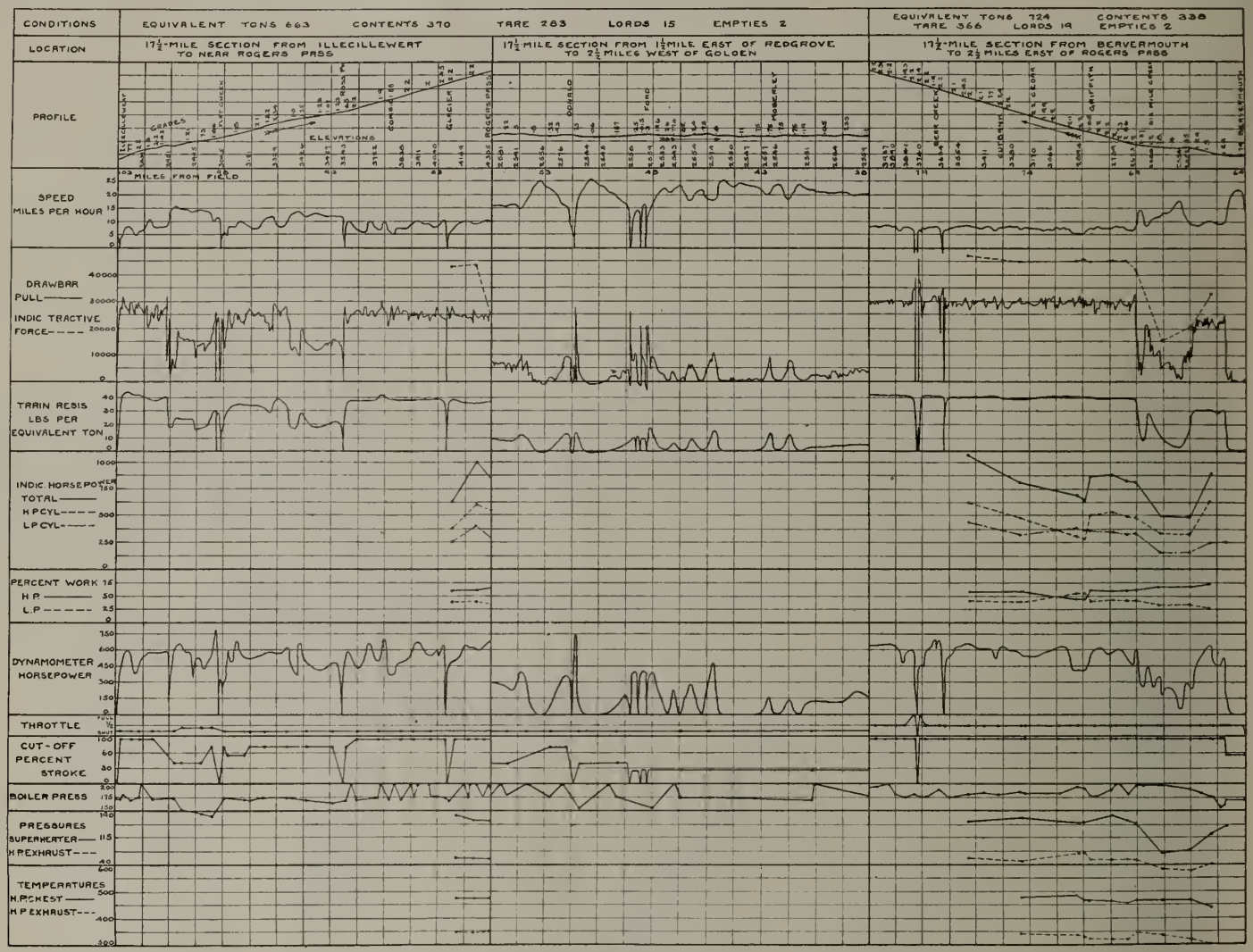
For the convenient handling of the pneumatic hammer in awkward places and also for use in general, the tool holder shown in the accompanying illustration, was designed. The stand consists of a rod A, cupped at its upper end to fit over a rivet head, and having a small air cylinder B at the lower end. The shell of this cylinder is constructed of hydraulic pipe, built up as indicated. Cupped leather packing on the piston attached to the lower end of rod A maintains a tight joint when air is introduced under the piston through the pipe on one side. The lower support is on the piece of jointed pipe C. A set of these pieces is kept in stock for use on jobs requiring different lengths between flooring and surface to be rivetted.

The tool is carried on a cross arm D in a crosshead slide arrangement. This is made up of a ball piece E attached to the tool and which is constrained to move in the correspondingly formed ways F, allowing a wide latitude of positions for the tool in operation. In order that the movement may be even freer, the guide carrying part C of the arm is slidably connected in a iece of piping as indicated, thereby permitting a radial movement of several inches. A slotted pin connection between upright and cross arm, leaves the latter free to swing through a small arc as desired.

J. D. Altimas, Car Accountant, C.P.R., Montreal, read a paper on Car Accounting at the regular monthly meeting of the Canadian Accountants Association in Montreal. Nov. 13.

Tests of C.P.R. Experimental Mallet Locomotive.

In the Aug., 1909, issue of The Railway and Marine World, a brief description of the experimental Mallet locomotive 1950, then being constructed by the C.P.R. at its Angus Shops, was given. A complete, detailed description, accompanied by the results of a series of tests, was contained in the Apr., 1910, number. These tests covered all phases of the locomotive operation, and led to a number of minor changes in design, which could be embodied in that locomotive without too much re-modelling.



Graphical Results of Tests on C.P.R. Experimental Mallet Locomotive 1950.

For those who have not the previous description at hand, the following principal dimensions are given:—

Tractive power	57,400 lbs.
Weight on drivers	262,000 lbs.
Total weight	262,000 lbs.
Weight of locomotive and tender	391,000 lbs.
Wheel base of each engine	10 ft. 4 ins.
Total engine wheel base	35 ft. 2 ins.
H. P. cylinders	23¼ x 26 ins.
L. P. cylinders	34 x 26 ins.

Briefly, the principal difference between this and the usual type of Mallet locomotive lies in the fact that the cylinders of the front truck are at the rear, bringing high and low pressure cylinders into close proximity. Leading and trailing pilot wheels are dispensed with. The boiler barrel is divided into three principal sections: steam generating section, superheater and feed water heater. The steam generating section and feed water heater are similar in construction, with an intervening box structure for downward projecting superheater tubes, the hot gases passing in succession through the three sections to the smoke box.

The original tests referred to in the previously published article were made between Hochelaga, Angus, and Mile End, in Montreal, where there is a maximum gradient of 1.5. To test the locomotive more fully under actual operating conditions on the class of traffic and location for which it was built, another series of tests was planned and carried out towards the middle of 1910. The section selected was the 130-mile stretch from Field to Revelstoke, B.C., in the heart of the mountains, this section taking in the Rogers Pass, where gradients as heavy as 2.45 are to be found.

Four tests were made: May 28, 1910, Revelstoke to Field; May 29, 1910, Golden to Rogers Pass; June 1, 1910, Revelstoke to Field, and June 2, 1910, Beavermouth to Rogers Pass. Of these first two tests, representative sections have been selected and are shown in the accompanying charts, where the results of the tests covering the more salient observations are embodied in readily understood curves.

On the May 28 test, from Revelstoke to Golden, the locomotive was operating with the following load: equivalent tons, 663; contents, 370; tare, 283; loaded cars, 15; and empties, 2. The first two sections shown in the chart are taken from the stretch under these conditions. The 17½-mile section, representing a heavy gradient, all the way, is chosen as representing the operation of the locomotive under conditions for which it was designed. The next section from a mile and a half east of Redgrove to 2½ miles west of Golden is a practically level stretch. These two runs afford a very interesting comparison. On the gradient, of course, the highest tractive effort is developed with a resulting decrease in speed. Just the reverse is the case on the level, where a very low tractive effort is produced with a much higher speed.

The third section, from near Beavermouth to 2½ miles east of Rogers Pass, was taken on a run in the opposite direction the second day of the tests, May 29, 1910. The conditions were: equivalent tons, 724; contents, 338; tare, 366; loaded cars, 19; and empties, 2. Like the first section, it represents a heavy gradient and demonstrates the qualities of the locomotive under such conditions.

In the original tests, it was found that the high and low pressure cylinders did not do equal work, so, in order to equalize the power, the diameter of the low cylinder was increased, making the ratio of cylinders 2.38. The wisdom of this is demonstrated in these present tests where it will be noticed that under grade load the work is very evenly divided.

Many interesting facts may be derived from a study of this series of curves. Unfortunately, lack of space precludes the possibility of giving all the tests, or even one complete test, but it is be-

lieved the best are shown in the three sections selected, which represent a distance of over 50 miles, or about half the length of run of the longer tests.

No observations were taken on the down grades on the run, as they are all so steep as to make the application of power unnecessary, it being possible to coast all the way.

Steel-Frame Parlor-Cafe Cars for Temiskaming and Northern Ontario Railway.

To meet the demand for more equipment of the "extra fare" class, the T. and N.O.R. Commission ordered from the Canadian Car and Foundry Co., in Aug., 1910, as mentioned in our rolling stock notes at the time, three parlor-cafe cars of the latest design. One of the finished cars and a floor plan are shown in figs. 1 and 2 respectively. They have been given the names of Sesekinika, Wasaksina and Tetapaga, and were delivered a short time ago.

These cars embody some interesting departures from the practice followed in the past by builders of passenger cars in Canada, as the trucks, deck and framing of the superstructures are made up of structural shapes. A general idea of this construction is given by the illustration, fig. 3, of the car skeleton before being sheathed.

The cars have the following principal dimensions: length over end sills, 70 ft. 3½ ins.; length over platform, 80 ft. 3½ ins.; width over side frame, 9 ft. 9⅝ in.; width over eaves, 10 ft. 1⅝ ins.; height over roof boards, 14 ft. 1 in; and centre to centre of trucks, 51 ft. 10 ins.

Fig. 1. One of the Steel-Frame Parlor Cafe Cars for T. and N.O. Ry.

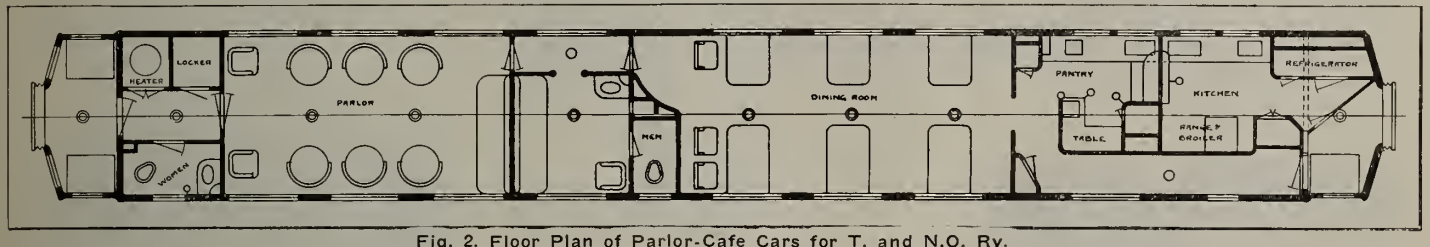


Fig. 2. Floor Plan of Parlor-Cafe Cars for T. and N.O. Ry.

STEEL BODY FRAME.—The centre sill of the underframe is composed of two 18-in. 44-lb. channels 77 ft. long, spaced 16 ins. apart, back to back, with 24 x ½ in. top and bottom cover plates extending the full length. Each side sill is composed of a 5 x 3½ x 9-16 rolled angle.. The cross ties are composed of 6-in. 86-lb. rolled channels.

Located 33 ft. apart, there are two deep diaphragms, each built up of two flanged steel web plates ⅜-in. thick, spaced 8½ ins. back to back, with 15 x ½ ins. top and bottom cover plates having cast-steel connecting webs at the outer end. These diaphgrams, with cross ties, hold the centre and side sills together as a solid unit.

The superstructure framing has a plate girder 35 ins. deep placed inside of posts, consisting of a 34 x 3-16 web plate with a 3 x ⅜ bar forming top chord, the previously mentioned angle side sill forming the bottom chord. The posts are 5 x 3 x 5-16 and 3 x 3 x 5-16 angles located as indicated. These are rivetted both to side sill and plate girder. The corner posts consist of 6-in. 8-lb. channels, and the end posts, 4-in. 7¼-lb. channels, all rivetted to the end plate, composed of a 4-in. 7¼-lb. channel with a 3 x 3 x 5-16 channel rivetted thereto. This construction is calculated to be anti-telescoping.

TRUCKS.—Pennsylvania standard six-wheel all-steel trucks, with a capacity of 80,000 lbs., are used, the construction being pretty clearly shown in fig. 4. These trucks have a wheel base of 11 ft. The wheels are 36 ins. diam., Schoen rolled steel, mounted on open hearth axles having 5 x 9 journals. The journal boxes are M.C.B. standard, with Harrison dust guards.

The Pennsylvania all-steel truck as shown, is composed almost exclusively of structural shapes, and is of a very solid construction. The pedestals are special, and are steel castings containing 3-coil 8 x 12½ ins. springs. The elliptic bolster springs are 36 in. centres, and contain 9 ply. Triple high-speed brakes are equipped, attached to a special channel brake beam holding steel-backed, unflanged brake shoes.

CAR BODY.—The flooring is of double ¾-in. yellow pine covered with ⅝-in. dark red Terrano. Beneath this a 2¼-in. course of mineral wool supported on a red-pine flooring acts as floor insulation. The eiling, except in kitchen, is of 3-16-in. Agasote.

The vestibules at both ends are of the Pullman special wide type C construction, with the usual detail. The platforms contain the Standard Coupler Co.'s buffing device, and have attached friction draft gear with 2-coil 8 x 8 draft springs with a drawbar height of 35 ins.

An artistic arrangement of the parlor has been obtained in this car as shown in fig. 5. There are 6 revolving chairs, 2 wicker chairs, and 1 sofa in this part, upholstered in green plush. The sofa has a locker beneath. The revolving chairs are each provided with a foot rest and have every convenience tending

Fig. 3. Steel Body and Superstructure.

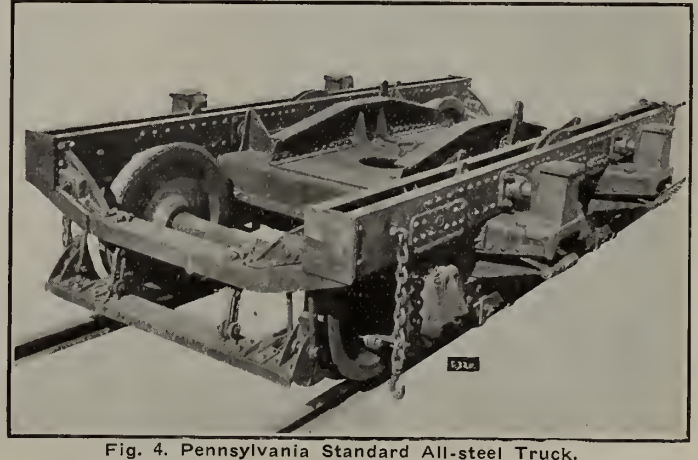


Fig. 4. Pennsylvania Standard All-steel Truck.

towards comfort. The parlor is 17 ft. long.

The smoking room, 7 ft. long, is provided with a sofa and a wicker chair, both upholstered in Spanish leather. This sofa also has a locker beneath. Off this room is the men's lavatory.

heating is from a Gold Car Heating Co.'s combination steam and hot water heater with a Frumveller heater having four rows of extra heavy 1¼-in. pipe, the lowest one 2 ins. from the floor.

The inside finish of the car body is in plain and figured mahogany; pantry,

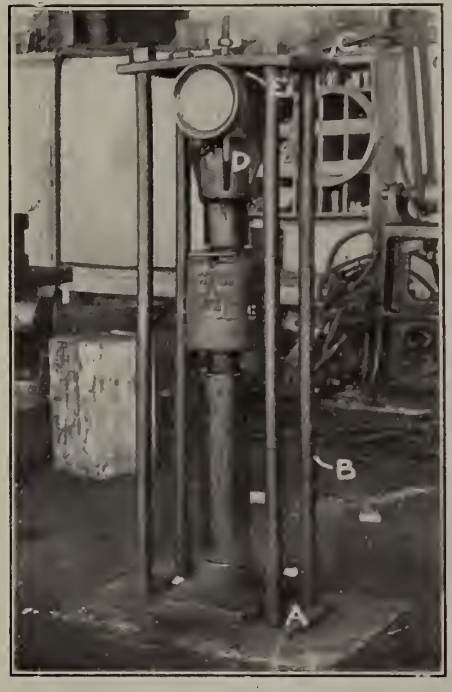
The mechanics find this device very convenient, not only for testing the jack's capacity, but also for use when testing the packing and joints of the jack. Any load within the capacity of the jack (and of the stand) can be very simply applied, and as readily released.

Fig. 5. Interior of Parlor.

Fig. 6. Interior of Dining Room.

The dining room, shown in fig. 6, has a length of 20 ft., and is arranged with 3 double and single tables with 18 leather upholstered mahogany chairs. These three rooms have a seating capacity of 35, 12 in parlor, 5 in smoking room and 18 in dining room.

The floor covering in parlor and dining room is of Victoria Wilton carpet, with an aisle strip of similar material. The passage-ways and smoking room have rubber tiling, with mosaic tile in the two saloons, the locations of which are indicated in the plan view.



Hydraulic Jack Testing Device.

The kitchen, 8 ft. long, is well-equipped with coal range having hot water tank, charcoal boiler, air-pressure water system, copper sink, six canisters, and three Bohn system refrigerators, one in kitchen, and two in pantry. The kitchen floor is covered with sheet copper.

Lighting is obtained from Pintsch gas lamps, of which there are 6 centre, 3 desk, 6 bracket, and 2 vestibule. The

plain mahogany; kitchen, birch-stained mahogany; vestibule, birch-stained mahogany, with mahogany doors and sash; and wainscoting, mahogany veneered. The trimmings throughout are of statuary bronze. A sufficient number of basket racks and coat hooks are provided.

The exterior is painted in the T. and N.O.R.'s standard olive-green coach body color. Striping, lettering and numbering are applied in gold leaf, the whole being covered with three coats of finishing varnish. The roof is finished in Pompeian red. The trucks are of the railway standard truck color with all other iron work in black.

Testing Hydraulic Jacks at the Intercolonial Railway Shops.

In the testing department of the I.R.C. locomotive shops at Moncton, N.B., a simple but useful and effective rig has been made for testing the standard hydraulic jacks of the type commonly found around metal working shops.

The jack to be tested, shown in the accompanying illustration, is placed on a plate A resting on a concrete foundation. From the four corners of the plate A, there are four bolts B passed through pipe sections, joining a similar piece of plate C at the top. The pipe sections act as distance pieces. A rigid, open frame is thus obtained.

Passing through the top plate C, there is a loose bolt holding up a small hydraulic press D, the plunger of which hangs downwards. Between the base of this press, and the upper plate C of the stand, there is a heavy coiled spring E of square bar stock, tending always to keep the press in its lowest position, making a resilient backing, and at the same time acting as a means for forcing home the jack plunger after its test.

The press cylinder has a pipe connection with pressure gauge attached as indicated. The area of the press plunger being known, it is a simple matter to calculate the pressure being exerted by the jack, which is placed in the position indicated, and the plunger forced upward in the usual manner.

A handy improvement to this rig would be to calibrate the gauge to record directly the total pressure on the press plunger, which is the weight being lifted by the jack. This is easily done, as the total pressure is a factor of the pressure per square inch, indicated by the gauge.

Saw for Cutting Packing Rings at C.P.R. West Toronto Roundhouse.

The accompanying illustration shows a device at the C.P.R. West Toronto roundhouse that the majority of roundhouses where compressed air is to be had would find it advantageous to copy. The device, which is self-contained, is attached to one of the roundhouse wooden columns, located between two of the tracks.

Saw for Cutting Packing Rings.

A small rotary air motor A, with projecting shaft, has a saw cutter B attached as indicated. In front of this cutter, with its surface slightly lower than the air-motor centre line, there is a small table C, slotted to receive the cutter. Attached to the post above there is a saw guard to ward off the flying chips thrown out by the rapidly revolving cutter, for the motor rotates at a very high speed.

Air is piped to the motor from above, controlled by the valve D. The device is oiled the desired amount by the oil cup E, connected to the air pipe through an elbow connection, in which is a valve. The air, passing the oil cup opening at a high velocity, creates a vacuum, drawing in the oil, regulating by the valve below by the oil cup.

The piston or valve packing rings to be saved are kept in stock, as they come from the moulds uncut. They are placed on the table, and a light pressure up against the saw cuts the ring through.

An Historical Steam Hammer.

The steam hammer shown in the accompanying illustration is interesting, not from its present value which is small, but from its historical connection. The writer came across it in the Intercolonial Ry. shops at Moncton, N.B., where it had been sent for repairs.

Historical Steam Hammer.

This ancient piece of machinery was manufactured by the Moir Co. of Halifax, N.S., about 34 years ago, for the I.R.C., being installed in the railway shops there. It has a 5-in. cylinder and an 18-in. stroke, with a weight of falling parts of about 175 lbs., and has a 7-in. square die block. The height over all is 7½ ft. and the floor space is 24 by 36 ins.

This hammer was in service at the Halifax shops up to a little more than a year ago, when, on the removal of the shops to a new location, it was shipped to Moncton for general repairs before being placed in service in the new shops. However, it was not considered worth the cost of repair so will doubtless come to the usual end of all tools, on the scrap heap.

What impressed the writer most forcibly was the marked similarity between present-day construction on small steam hammers, and construction as it existed upwards of 35 years ago. In almost all details, it compares very favorably with present-day practice in the construction of hammers of similar proportions. A review of the past develops some remarkable instances of the slight progress made in certain lines of construction.

Car-wheel Drop Pit on the Intercolonial Railway.

Many and varied are the kinds of drop pits to be found around locomotive and car repair shops and roundhouses. One of the latest has been installed at the I.R.C. at St. John, N.B.

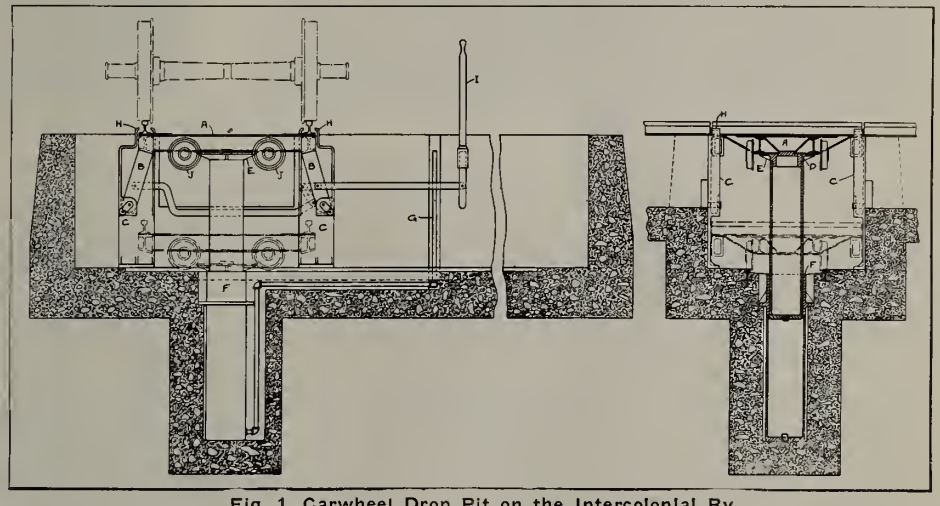


Fig. 1. Carwheel Drop Pit on the Intercolonial Ry.

Fig. 1 clearly shows the arrangement and workings of the mechanism connected with the drop pit. A table, A, built up of plate and structural shapes with end castings, carries short pieces of track, forming a unit of the through track in the shop or roundhouse. This table is supported by four pinned struts B, one at each corner. These struts are pin-connected to pit castings C, into which they may be swung clear of the wheel table.

The lower face of the wheel table, at D, is recessed to receive a projection on the face of the head casting, E, on the end of a long air plunger. This is merely a loose connection with no attaching bolts.

The actuating air cylinder is of sufficient length to give the required drop into the pit, this drop depending on the use to which the pit is to be put, and is necessarily larger in a roundhouse. The upper end, F, of the cylinder has three packing rings forming a good working joint. Air is introduced to the lower face of the plunger through a control valve on the pipe G. The normal position of the plunger is in its lowest position with the head E resting on the upper face of the cylinder.

To operate, air is introduced under the plunger, lifting it into contact with the lower surface of the table, raising the latter the amount permissible by the stop block H. Levers I, one on each side of the table, when thrown to the right, with the table in its uppermost position, draw out the struts B into their recesses. Releasing the air gently lowers the table into the pit, the plunger drawing away from the table when it reaches the bottom.

The table is in reality a small car with four wheels, J. Rails laid in the pit at right angles to the upper tracks, form a runway for the little car with its load. The car then being run to the left, clearing the locomotive or car on the upper track, may have its load, consisting of a pair of wheels, raised for repair purposes, or to have another pair replace them.

Figs. 2, 3 and 4 show the mechanism as applied to a pit in the I.R.C. car repair shops at St. John, N.B. In fig. 2, the workman at the wall is ready to turn on the air to lift the table against its stops while the workman to the right draws out the supporting struts from under the table. The little car when

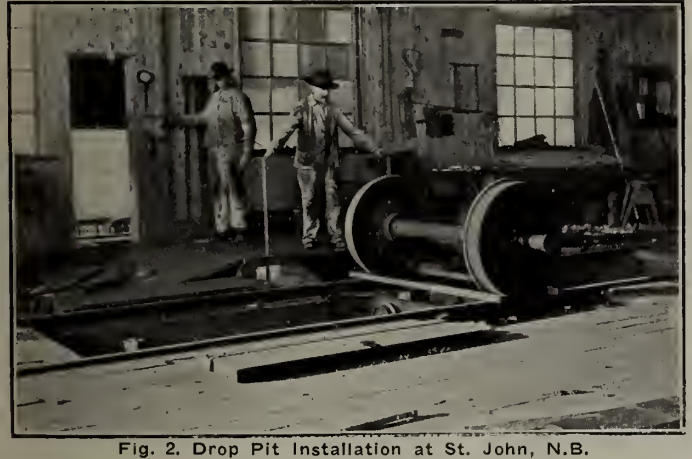


Fig. 2. Drop Pit Installation at St. John, N.B.

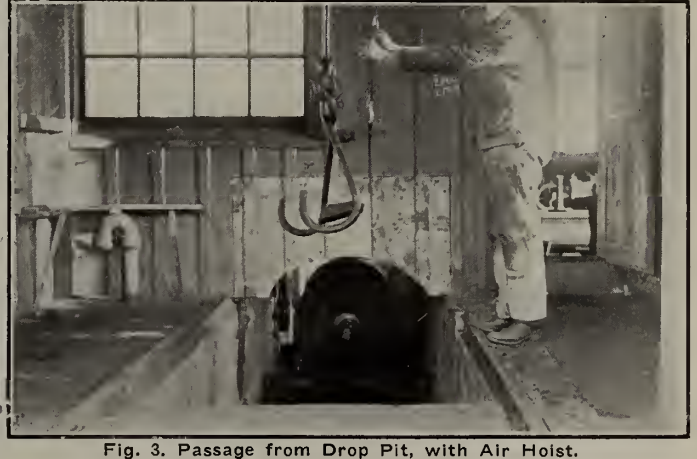


Fig. 3. Passage from Drop Pit, with Air Hoist.

lowered runs into the passageway over which the workmen are standing. This picture does not give a very good idea of its use, its greatest value being demonstrated when used under a car or locomotive.

The little car containing the pair of wheels passes through the aforementioned passageway into the lean to fig. 3 shown through the open door in fig. 2.

Fig. 4. Wheel Storage leading from Drop Pit Shed.

The air hoist shown in fig. 3 raises the wheels, which when twisted around, are lowered on to the standard gauge track which forms the edge of the pit.

From this point the wheels are run out on to the little car shown in fig. 4. This car runs along a narrow gauge track, with wheel storage tracks at right angles to it, making it very convenient for storing or replacing new wheels, both old and new wheels being kept separate and easy to get at.

This drop pit was invented by W. U. Appleton, Assistant to the Superintendent of Motive Power, I.R.C., Moncton. N.B., and by G. E. McCoy. The wheel pit mechanism is patented in Canada, no. 132,430, and in the United States, no. 1,002,797.

Grain Rates on the Intercolonial Railroad.

Under date of May 19, 1910, the Board of Railway Commissioners, on the application of the Montreal Board of Trade, passed the following order:—

"The rates of the G.T.R. and C.P.R. on ex-lake western grain carried from lake or river ports to points on the lines of the said companies in the provinces of Ontario and Quebec, shall be the same for equivalent distances from all lake and river ports at which facilities exist for the transhipment of the said grain from vessels to cars, between Depot Harbor and Montreal, inclusive, and shall include the cost of like services at all such ports of transhipment and at all points of destination, whenever the said cost is included in the rate or rates at one or more port or ports of transhipment, or at one or more point or points of destination; and to points off the lines of the said companies to which points joint rates are made by the addition of "arbitraries," the said arbitraries shall be the same on shipments from all the said ports of transhipment. On such grain transhipped at ports west of Montreal, destined to points east of Montreal to which points through rates are based on arbitraries, the western portion of the said rates shall be based on St. Henri mileage in the case of the G.T.R. and on Outremont mileage in the case of the C.P.R. The G.T.R. and C.P.R. shall give effect to this order by publishing and filing special tariffs to take effect not later than June 13."

Some time since the Montreal Board of Trade requested the Government Railways Managing Board to apply the rates ordered by the Board of Railway Commissioners on grain ex-lake from Montreal to points in the Province of Quebec east of Levis, and which are in force on the Intercolonial Ry. as far east as Levis on account of competitive reasons. The Government Railways Managing Board having declined to grant the request, the Montreal Board of Trade has petitioned the Minister of Railways in regard to the matter.

The petition sets forth that Parliament passed the Railway Act of 1906 for the protection of shippers and for the regulation of rates and other matters connected with railway transportation, and that practically all railways in Canada, excepting the Intercolonial, are subject to its conditions.

In the case of a shipper having a complaint against a railway other than the Intercolonial, there is an appeal to the Board of Railway Commissioners from the decision of the management of the company, the Commissioners being governed by the provisions of the Railway Act in their consideration of the complaint, while in the case of a complaint against the Intercolonial there is no appeal from the decision of the Managing Board of the Canadian Government Railways, which Board is not bound by the Act considered necessary by Parliament to safeguard the rights of the public in their dealings with railways generally.

The Intercolonial discriminates in favor of Maritime Province shippers, to the great detriment of Montreal shippers, and the best interests of all shippers would be more properly served if the Intercolonial were placed under the jurisdiction of the Railway Commission, which would result in rates being maintained on an equitable basis all over that railway.

The Intercolonial has a great number of private special rates to which the public have no access, and were the Intercolonial governed by the Railway Act these rates would have to be filed with the Railway Commission and posted at each Intercolonial Ry. office for the information of the public and thus shippers would know exactly what rates are being charged.

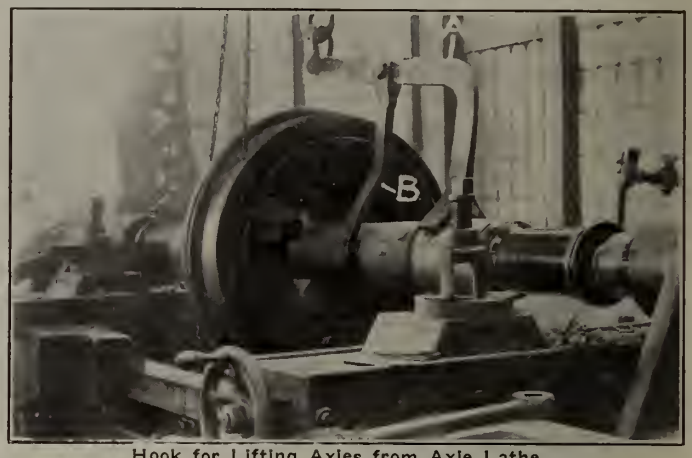
The Intercolonial is in competition with the C.P.R. to points such as St. John, N.B., and it seems to be an anomaly that the C.P.R. should be governed by the Railway Commissioners and the Intercolonial be free from such control.

Were the Intercolonial governed by the Railway Act, the Minister and the railway officials would be relieved from the political pressure for preferential treatment as to rates, etc., to which they are now liable.

The petition concludes by urging that the Intercolonial be placed under the Board of Railway Commissioners' jurisdiction.

Hook for Lifting Axles from Lathe at C P.R. Angus Shops.

Of all the jobs that are constantly recurring in railway shop routine work, there are probably few that, in proportion to size, are as awkward to handle as the placing and removing of an axle in an axle lathe. The drive being immediately over the centre makes it impossible to lift the axle out directly with chain or other securing means placed at the centre or point of balance. A two-stage shifting operation is required.



Hook for Lifting Axles from Axle Lathe.

A simple hook for remedying this defect has been devised at the C.P.R. Angus shops, in the tender wheel department, of which J. A. Hope is assistant foreman. As shown in the accompanying illustration, the device consists simply of a bent forked hook A, having a hooked arm B pin-connected at the middle of the horizontal portion of A. The horizontal section is made of such length that the hook and forked arm will clear the centre or drawing part of the axle lathe, gripping the axle in the manner indicated.

This hook device is quite a time saver, as the time of setting up and taking down an axle is very materially reduced by it.

C.P.R. Scholarships at McGill University

Sir Thos. G. Shaughnessy, President, C.P.R., has issued a circular stating that two free scholarships, covering four years' tuition in the Faculty of Applied Science of McGill University, are offered, subject to competitive examination, to apprentices and other employes enrolled on the company's permanent staff and under 21 years of age, and to minor sons of employes. The competitive examination, which will be the regular entrance matriculation examination, will be held at the University, Montreal, and at other centres throughout Canada, in June. The candidates making the highest average and complying with the requirements of admission will be awarded the scholarships and have the option of taking a course in any department of the Faculty of Applied Science. Scholarships will be renewed from year to year, to cover a period not exceeding four years, if, at the close of each session, the holder thereof is entitled, under the rules, to full standing in the next higher year.

Applications for certificates entitling eligible persons to enter the competition should be addressed to C. H. Buell, office of Vice President McNicoll, Montreal.

The Canadian Northern Ontario Ry. has adopted the 24 hour system for its working time tables, but the Passenger Department will continue to use a.m. and p.m. time on its folders.

Ten-Wheel Locomotives for Duluth, Winnipeg and Pacific Railway.

The Duluth, Winnipeg and Pacific Ry., a subsidiary of the Canadian Northern Ry., has recently received from the Baldwin Locomotive Works, Philadelphia, five passenger locomotives, which are equipped with fire-tube superheaters. They are of the ten-wheel type, and exert a tractive force of 28,800 lbs. The ratio of adhesion is 4.57. Although not exceptionally large for their type, they represent a highly efficient class of power, and the application of superheaters should materially increase their capacity.

The boiler is of the wagon-top type, with a long fire-box placed above the frames. The mud ring is of forged iron, and is sloped toward the front. This arrangement provides a deep throat, the distance from the top of the grates to the bottom row of tubes being 26¾ ins. The flexible staybolts number 218; they are applied in the sides, throat and back, and are placed principally in the outside rows. The crown staying is radial, and the four centre rows of bolts are provided, under the crown sheet, with pressed steel nuts and copper gaskets.

The frames are of steel, with single front rails. They are braced transversely by the guide yoke, the valve motion bearer, a broad steel tie immediately ahead of the main pedestals, and a tie under the front end of the fire-box. The front bumper and back foot plate are of cast steel. Because of the location of the fire-box, the equalization is arranged with yokes over the main and rear driving boxes and half elliptic springs between adjacent axles. At the rear, the frames are supported on full elliptic springs.

The tender is carried on two four-wheeled trucks, which have cast steel bolsters and steel-tired wheels. The frame is composed of 13-in. channels. The tank has a water bottom, and is fitted with steel coal gates. It has a capacity for 6,000 gals. of water and 10 tons of fuel.

The principal dimensions are appended:—

Cylinders	22 x 26 ins.
Valves	Balanced piston
Boiler, type	Wagon top
Boiler, material	Steel
Boiler, diameter	66 ins.
Boiler thickness of sheets	5/8, 11-16, 3/4 ins.
Boiler, working pressure	170 lbs.
Boiler, fuel	Soft coal
Boiler, staying	Radial
Tenders, wheels, diameter	33 ins.
Tender, journals	5½ x 10 ins
Tender, tank capacity	6,000 gals.
Tender, fuel	10 tons

Engine equipped with fire tube superheater. Superheating surface 462 sq. ft.

Birthdays of Transportation Men in January.

Many happy returns of the day to:—

W. U. Appleton, Assistant to Superintendent of Motive Power, Intercolonial Ry., Moncton, N.B., born there, Jan. 29, 1878.

A. H. Bears, Master of Bridges and Buildings, C.P.R., Saskatoon, Sask., born at Charlottetown, P.E.I., Jan. 6, 1857.

F. X. Belanger, General Freight and Passenger Agent, Temiscouata Ry., Riviere du Loup, Que., born at Chlorydormes, Que., Jan. 20, 1876.

R. H. Bell, Commercial Agent, Canadian Northern Ry., Pittsburgh, Pa., born at Toronto, Jan. 13, 1865.

G. McL. Brown, European Manager, C.P.R., London, Eng., born at Hamilton, Ont., Jan. 20, 1866.

W. H. Burr, Traffic Manager, Dominion and Western Express Cos., Toronto, born at Bloomington, Ill., Jan. 19, 1864.

Ten-wheeled Locomotive for Duluth, Winnipeg and Pacific Railway.

The fire-door opening is formed by flanging both sheets outward, and uniting them with a sleeve.

The superheater is of the top-header type, with 1½-in. pipes; and the elements are placed in 24 tubes, each 5⅜ ins. in diameter. Considering each square foot of superheating surface as equivalent in value to 1½ sq. ft. of evaporating surface, the total equivalent heating surface of the boiler is 2,613 sq. ft., or 229 sq. ft. per cubic foot of cylinder volume.

The superheated steam is conveyed from the header to the steam chests through pipes which pass through the side walls of the smoke-box. The steam thus reaches the cylinders in the most direct manner possible. The distribution is controlled by 12-in. piston valves, arranged for inside admission and set with a constant lead of ¼ in. The cylinders are bushed, and the piston and valve rods have front extensions. A five-feed lubricator is placed in the cab, and separate leads are run to each cylinder and steam chest, while the fifth lead is run to the two air pumps. The valve gear is of the Walschaerts type. Castellated nuts are used on the motion work, crank pins and crosshead pins.

Firebox, material	Steel
Firebox, length	113⅛ ins.
Firebox, width	40¼ ins.
Firebox, depth, front	79 ins.
Firebox, depth, back	70 ins.
Firebox, thickness of sheets, sides	⅜ in.
Firebox, thickness of sheets, back	⅜ in.
Firebox, thickness of sheets crown	⅜ in.
Firebox, thickness of sheets, tube	½ in.
Water space, front	4 ins.
Water space, sides	4 ins.
Water space, back	3½ ins.
Tubes, diameter	5⅜ and 2 ins.
Tubes, material	Steel
Tubes, thickness	5⅜ ins. 9 W.G.
Tubes, thickness	2 ins. 11 W.G.
Tubes, number	24 5⅜ ins., 189 2 ins.
Tubes, length	13 ft. 2¼ ins.
Heating surface, firebox	183 sq. ft.
Heating surface tubes	1,737 sq. ft.
Heating surface, total	1,920 sq. ft.
Heating surface, grate area	31.6 sq. ft.
Driving wheels, diameter, outside	63 ins.
Driving wheels, diameter, centre	56 ins.
Driving wheels, journals	9 x 11 ins.
Engine truck wheels, diameter	30 ins.
Engine truck wheels, journals	5½ x 12 ins.
Wheel base, driving	14 ft. 6 ins.
Wheel base, rigid	14 ft. 6 ins.
Wheel base, total, engine	24 ft. 10 ins.
Wheel base, total, engine and tender	57 ft. 7½ ins.
Weight on driving wheels	131,850 lbs.
Weight, on truck	44,450 lbs.
Weight, total, engine	176,300 lbs.
Weight, total, engine and tender, about	295,000 lbs.
Tender, wheels, number	8

W. A. Cowan, Assistant to Assistant Chief Engineer, C.P.R. Eastern Lines, Montreal, born at Galt., Ont., Jan. 22, 1877.

J. E. Dalrymple, Vice President, G.T.R., Fourth Vice President, G.T.P.R., and Vice President, Central Vermont Ry., Montreal, born at Montreal, Jan. 1, 1869.

J. E. Everell, Superintendent, Montmorency Division, Quebec Ry. Light and Power Co., Quebec, born at Cap Rouge, Que., Jan. 1, 1863.

Sir Sandford Fleming, K.C.M.G., director, C.P.R., born at Kirkcaldy, Scotland, Jan. 7, 1827.

W. H. Gougem, Locomotive Foreman, C.P.R., Cartier, Ont., born at Point Alexander, Ont., Jan. 16, 1872.

Gordon Grant, Chief Engineer, National Transcontinental Ry., Ottawa, born at Dufftown, Scotland, Jan. 2, 1861.

H. V. Harris, ex-General Manager, Midland Ry. of Nova Scotia, now of Montreal, born at Devonport, Eng., Jan. 16, 1857.

G. F. Hichborn, formerly Agent, Great Eastern Fast Freight Line, New York, born at Boston, Mass., Jan. 13, 1875.

Carl Howe, Manager, New York Central Fast Freight Lines, Chicago, Ill.,

born at Berrien Springs, Mich., Jan. 11, 1870.

W. C. Hunter, ex-Manager, New Brunswick Coal and Ry. Co., Sussex, N.B., born at St. John, N.B., Jan. 4, 1865.

W. J. Hunter, Division Freight Agent, G.T.P.R., and Commercial Agent, G.T.R., Winnipeg, born at Toronto, Jan. 10, 1864.

H. G. Kelley, Vice President, G.T.R., Montreal, born at Philadelphia, Pa., Jan. 12, 1858.

James Kent, Manager, C.P.R. Telegraphs, Montreal, born Jan. 15, 1854.

A. Lichtenhein, Galena Signal Oil Co., New York, born there, Jan. 15, 1855.

A. J. McGee, Secretary-Treasurer, Temiskaming and Northern Ontario Ry., Toronto, born at Lachine, Que., Jan. 24, 1876.

G. Pepall, Assistant Foreign Freight Agent, G.T.R., and Agent, National Despatch-Great Eastern Line, Toronto, born at High Wycombe, Bucks., Eng., Jan. 15, 1849.

W. Phillips, General Freight Agent Canadian Northern Ry. Eastern Lines, Toronto, born there, Jan. 31, 1870.

W. Pratt, Superintendent, Sleeping and Dining Cars and Hotels, Canadian Northern Ry., Winnipeg, born at Sibbertoft, Northamptonshire, Eng., Jan. 18, 1870.

John Pullen, President, Canadian Express Co., Montreal, born at Shepton Mallet, Eng., Jan. 23, 1863.

L. J. Rouleau, Travelling Freight Agent, G.T.R., and Agent, National Despatch-Great Eastern Line, Montreal, born there, Jan. 6, 1879.

B. G. F. Rutley, ticket agent, C.N.R. and G.T.P.R., Fort Garry Union Station, Winnipeg, born at Chatham, Ont., Jan. 25, 1879.

S. J. Shannon, Comptroller and Treasurer, Intercolonial Ry., Moncton, N.B., born at Halifax, N.S., Jan. 18, 1865.

J. G. Sullivan, Chief Engineer, C.P.R. Western Lines, Winnipeg, born at Bushnell's Basin, N.Y., Jan. 11, 1863.

J. A. Villeneuve, Comptroller and Treasurer, Richelieu and Ontario Navigation Co., Montreal, born there, Jan. 4, 1864.

O. C. Walker, Inspector, Refrigerator Service, C.P.R. Western Lines, Winnipeg, born at Newport, Mon., Eng., Jan. 31, 1877.

F. J. Watson, Assistant General Freight Agent, G.T.R., Montreal, born at Toronto, Jan. 12, 1866.

G. H. Webster, C.E., Vancouver, B.C., born at Creemore, Ont., Jan. 31, 1858.

T. H. White, Chief Engineer, Canadian Northern Pacific Ry., Vancouver, born at St. Thomas, Ont., Jan. 27, 1848.

A. Wilcox, General Superintendent, Western Division, C.N.R., Edmonton, Alta., born at Kincardine, Ont., Jan. 2, 1865.

Regulations for Transportation of Milk.

The Board of Railway Commissioners, on the application of the Montreal Milk Shippers' Association, has passed the following order, 15413, which has already gone into effect:—

That milk be transported in baggage cars upon the following conditions:—

All cans must have name or initials of owner on cover or shoulder, in stencilled (not painted) letters, size not less than one inch.

All cans must bear name of shipping station in stencilled (not painted) letters, size not less than one inch, same to be placed on shoulder of can.

Each can of milk shall have attached to it, in addition to the milk ticket as now in use, a shipping tag addressed to consignee, and agents and train baggagemen shall not be required to receive cans for shipment, unless so tagged, and shall not be required to accept cans for shipment not properly and legibly stencilled.

Covers of cans must be securely attached to cans to prevent spilling or pilferage of contents, and where possible they shall be wired on and sealed with lead seals.

All cans shall be loaded by shippers at shipping point.

Empty cans shall be returned by the railway company to the shipping point without other charges than payment of original tolls. Where the number of empty cans is 20 or less, unloading at shipping point shall be done by employes of railway company. Where the number of cans is more than 20 and less than 40 shippers shall provide one man at shipping point for assisting in unloading. Where number of cans is 40 or more, shippers shall provide two men for assisting in unloading; provided that shippers shall not be required to attend at shipping point to assist in unloading at more than one train each day. In event of trains being delayed more than 30 minutes beyond schedule time of arrival, all empty cans shall be unloaded by employes of railway company.

On and after Sept., 1912, railway companies shall not be required to accept for transportation any cans of less capacity than eight gallons, whether containing milk or empty.

On and after Sept., 1912, milk shipments shall be handled on memorandum forms, and receipts shall be taken from consignee. This will be supplemental to ticket system now in effect, the railway company providing necessary shipping forms to all milk shipping stations. At stations where companies have regular agents, such agents shall fill in the form respecting number of cans to be shipped, from information supplied by shippers. Such memorandum shall then, in the hands of the train baggageman, accompany shipment to its destination, where the company shall obtain receipts from consignee.

At flag stations billing shall be done by shippers, who shall enter the various consignments on one form, in legible writing.

Shippers must have milk at point of shipment, properly way-billed, at least 15 minutes before arrival of train on which it is intended to be shipped.

Railway companies shall continue issuance of milk tickets, which shall be good only if presented within one year from date of issue.

Railway companies shall not be liable for loss of, or damage to, or delay in any shipment of milk or empty cans, unless same be caused by or result from negligence of the company, or its servants or agents.

Telephone Train Dispatching Circuits on the Canadian Pacific Railway.

Following are particulars of the various telephone train dispatching circuits installed on the C.P.R. up to date, for which we are indebted to W. J. Camp, Electrical Engineer, C.P.R. Telegraph Department. It is expected that additional circuits will be installed after the appropriations for 1912 have been made:—

Terminal Points	Dispatchers' Location.	Miles Cirkt.†	No. in use.	Selectors spare.	Kind of Equipment.	Date put in service.
St. John-Vanceboro	St. John	90	17	3	Gill and N. E.	Aug. 27, 1911
Vanceboro-Megantic	Brownville Jct	216	26	3	" "	" "
Megantic-Farnham	Farnham	132	20	4	" Kellogg	March 31, 1911
Newport-Montreal	"	120	28	4	" N. E.	June 2, 1908
Quebec-Montreal	Montreal	174	29	0	" "	May 14, 1911
Brockville-Ottawa and Chalk River	Smiths Falls	172	27	3	" "	Sept. 17, 1911
Smiths Falls-Havelock	Havelock	109	14	1	" "	July 16, 1911
Havelock-Toronto	Toronto	101	18	0	" "	" "
Toronto-London	London	115	22	2	" "	March 1, 1911
St. Thomas-Pt. Burwell						
St. Marys-Windsor	"	227	36	2	" "	June 1, 1911
Toronto-Muskoka	Toronto	132	30	2	" "	Oct. 15, 1911
Muskoka-S. Ste. Marie	Sudbury	312	29	7	" "	Dec. 27, 1910
Chalk River-Cartier	"	232	27	4	" "	" "
Mattawa-Timiskaming	Orders relayed at Mattawa	47	0	0	4 Bridg. Magnetos*	Feb. 1, 1911
Cartier-White River	White River	269	19	3	Gill and N. E.	Oct. 1, 1910
White River-Fort William	"	251	17	5	" "	Sept. 1, 1909
Winnipeg-Brandon	Winnipeg	133	23	3	" "	Aug. 17, 1909
Brandon Broadview	Brandon	132	14	6	" "	Nov. 5, 1910
Broadview-Moosejaw	Moosejaw	135	18	4	Sandwich & Kellogg	Oct. 20, 1910
Moosejaw-Swift Current	"	111	15	5	Gill and N. E.	Nov. 27, 1910
S. Current-Medicine Hat	Medicine Hat	147	14	6	" Kellogg	Oct. 1, 1909
Medicine Hat-Calgary	"	180	18	3	" "	* 1911
Calgary-Field	Calgary	136	16	3	" "	* 1911
Field-Revelstoke	Revelstoke	130	20	2	" "	Oct. 26, 1911
Revelstoke-Kamloops	"	129	15	3	" "	* 1911
Total		3932	512	78		
	Bridging sets		4			

* Under construction.
† May be combined in one circuit.

516 Stations.

A circuit has also been installed on the branch line from Kentville to Kingsport, N.S., 14 miles, which is a portion of the Dominion Atlantic Ry. now under C.P.R. control.

Freight Rate From the East to the Prairie Provinces.

The Supreme Court of Canada, on Dec. 6 dismissed the appeal of the Canadian Northern and Northern Pacific Railway Companies vs. the Regina Board of Trade, the subject of the appeal being the Board of Railway Commissioners' order 12520, of Dec. 10, 1910. The Regina Board of Trade applied under secs. 314 and 339 of the Railway Act, for a reduction in rates in classes 1 to 10 on goods shipped from Eastern Canada to Regina. The Board of Railway Commissioners ordered that the C.P.R. and C.N.R. publish and file new freight tariffs, to take effect not later than April 1, 1911, removing the discrimination at present existing in the tariffs to points in Manitoba, Saskatchewan and Alberta, from Fort William, Port Arthur and points east thereof, in favor of Winnipeg and other points in Manitoba, and against points west thereof, by reducing the rates from Fort William, Port Arthur and points east thereof, to Regina and Moose Jaw and other points west of the said favored points. The Supreme Court's judgment confirms this order.

On a similar application by the Edmonton Board of Trade the Chief Commissioner decided, Dec. 21, 1910, that the order made in the Regina case should apply.

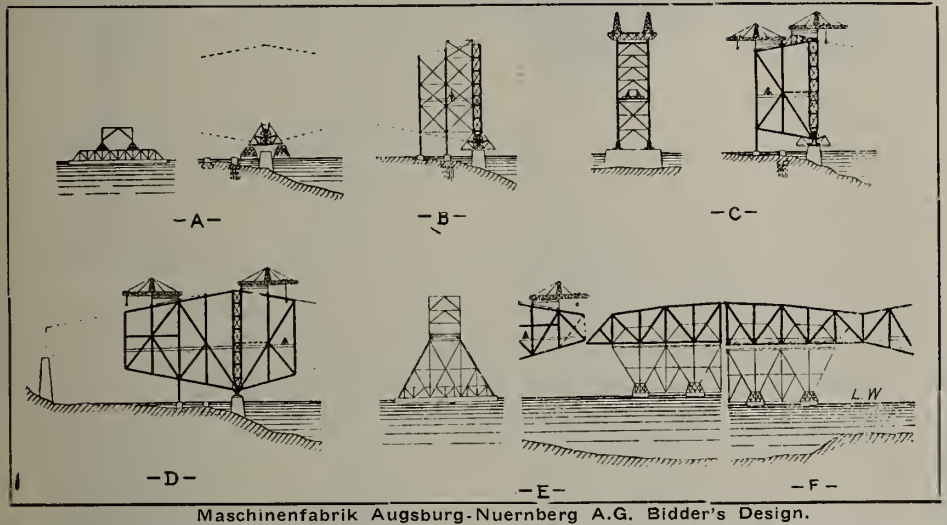
Anglo-Canadian Contractors, Ltd., has been incorporated under the Dominion Companies Act, with $250,000 capital and office at Toronto, to carry on a railway, marine and general contracting business.

Schemes of Erection Proposed for the Quebec Bridge.

In our last four issues we gave the schemes of erection proposed by the St. Lawrence Bridge Co., the British Empire Bridge Co., the Pennsylvania Steel Co., and Maschinenfabrik Augsburg-Nuernberg A.G., the latter for the Board of Engineers' design only. Following is the Maschinenfabrik Augsburg-Nuernberg A.G., bidder's design:—

The design proposed has a single-intersection web-system, similar to the board's design, but the web triangles are considerably larger. The lengths of the several arms of the bridge are somewhat different, but the main span is unchanged. The design was made with the intention of floating in the suspended span.

On account of the long panels the floorbeams are very heavy. To facilitate manufacture and erection, they are built as box-girders, the two webs being shipped separately and connected after erection by a cover plate. In order to limit as much as possible the use of secondary members and also to facilitate certain parts of the erection, eyebars are used to only small extent in the design. The top cho ds and main tension members are built-up riveted members. Each main pier is provided with a special pedestal of cast steel providing a central transmission of load on the pier and permitting of free deflection of the bridge. The pedestals are set on riveted steel grillages sunk into the masonry piers to provide a uniform distribution of load. The centre span is suspended from the cantilever arms by means of cables, just as proposed for the board's design.



Maschinenfabrik Augsburg-Nuernberg A.G. Bidder's Design.

The plan shows several stages in the erection, and illustrates the general method proposed. Both arms are to be cantilevered out from the main piers and the stability of the work ensured by temporary supports under the anchor arm. In this case, however, travelling cranes are operated on the top chords, two on each anchor arm and two on each cantilever arm at the same time. These cranes have 82-ft. booms and are arranged so as to be able to be moved crosswise on a crane trestle which itself can move longitudinally on the upper chords of the bridge. All cranes as well as the crane trestles are operated by means of electrically-driven winches. Each of the cranes has a maximum lifting capacity of 120,000 lbs. at the extreme end of its boom and a capacity of 200,000 lbs. within a closer area.

The erection of the main bridge starts with the laying down of the shoes. These shoes are designed to be floated in place and to be set on previously prepared bearings as the tide goes down. While the shoe is being put in place, the temporary falsework at points 6 and 7 is raised and posts 6, 7 and 8 erected along with the sway bracing of the bridge. The crane trestle for the anchor arm and its two travelling cranes are placed on top of the group of posts 6, 7 and 8, which with its permanent and temporary bracing acts as a tower. After the cranes have erected the missing parts of the main trusses and the flooring between 6, 7 and 8, the crane trestle is brought to its second position on the posts 6 and 7 in order to make way for the cantilever-arm crane trestle and cranes. These cranes then build panel by panel the main trusses, bracing and floor of the bridge up to the anchor pier on one side and the end of the cantilever arm on the other, employing during the operation such temporary members as are required.

All material for erection is lifted on to the bridge from scows. The hoisting is done by a crane travelling on the floor of the bridge, having a capacity of 200,000 lbs. This crane can then transport the material to any point on the bridge where it is required. The runway tracks of this crane always project beyond the last panel erected in order to serve the overhead cranes to the best advantage.

The suspended span would be erected on high falsework as for the board's design. The span is supported at each panel-point, by a truss on the falsework, the whole carried on four pontoons each 295 ft. long and 49 ft. 3 ins. wide. When the suspended span has been completely erected on the floating scaffolding, it is towed to the bridge site. After its arrival there it is accurately held in position by means of wire cables and winches placed on the river banks.

To facilitate the operation of coupling up the suspended span to the cantilever, as well as to avoid blocking traffic on the river any longer than absolutely necessary, a special supporting and lifting device is provided at the ends of the cantilever arm. This temporary support is made of cross beams suspended from the end posts of the cantilever arms by means of hinged tension members. At high tide these supports, previously swung back in a slanting position towards the piers to allow the suspended span to be floated into its closely approximate final position, are allowed to swing back to their normal position, the cross beams passing under the ends of the bottom chord of the suspended span at its four corners. As the tide goes out the bridge comes to rest on these temporary supports and the falsework floats clear. The suspended span is then adjusted to its final position by means of 16 hydraulic jacks located on the upper chord, each having a capacity of 1,322,000 lbs. and a lift of about 3 ft., operating a frame connected to the above mentioned cross beams. A safety device holds the cross beams in place step by step as it is raised, thus providing against any accident. When the lifting has been completed the wire hangers are fitted to their bearings and the suspended span, previously lifted a little too high, is lowered to its permanent position.

Telephone Train Dispatching on the Algoma Central and Hudson Bay Railway

This line has been dispatching trains by telephone since 1902, using on the Main Line Division the Bell 1000 ohm magneto type wall instruments and on the Michipicoten Division the New State 80 ohm series instruments.

Last spring the construction of a metallic circuit of no. 12 new British standard hard drawn copper wire was commenced. When completed the line will extend from Sault Ste. Marie, north to Hobon, 195 miles, with connection at Hawk Lake with the Michipicoten Division metallic circuit of 36 miles, covering the Michipicoten, Josephine and Magpie branches and serving the Helen and Magpie mines. The existing pole lines were practically rebuilt last summer and new lines have been built from Pangissin, 68 miles north of Sault Ste. Marie, to mileage 107, and from Josephine Mine Jct. mileage 107 to 125. The gap of 18 miles is now being closed and it is hoped to secure communication between Sault Ste. Marie and Michipicoten Harbor early in January.

The Hawk Lake-Hobon extension of some 30 miles will be built next spring and further extension of the system north of the C.P.R. proceeded with. A portion of the new dispatching telephone apparatus will be installed this winter and the installation, with the exception of the Hobon extension, will be completed early next spring. This will give a dispatching circuit of 190 miles for the present and 220 miles on completion of the Hobon extension.

The line has been constructed on a substantial standard specification and the equipment installed is the last word in up-to-date telephone apparatus. It is furnished by the Northern Electric and Manufacturing Co., Montreal, and consists of their dispatcher's telephone equipment, chest transmitter, head receiver, etc., and their selector equipment for calling stations. For stations at which agents are maintained the office is provided with their 1020 B transmitter arm and head receiver, and station selector set. Flag stations are provided with a 1317 W type wall telephone. Portable telephone sets with line poles are provided for use of train crews.

The system when completed will admit of the dispatchers communicating with one or more stations simultaneously, allow of the sending of time over the wire, and also the transmission of company's and commercial business.

Between Sault Ste. Marie and Searchmont, 30 miles, an iron metallic circuit is provided for commercial business and a ground circuit extends from Searchmont to mileage 79. On the Michipicoten branch an iron metallic circuit between Michipicoten Harbor and Helen Mine, 11½ miles, cares for commercial business and an iron ground circuit from Helen Mine to Grassett on the C.P.R. cares for commercial business between the mines and the outside.

We are indebted for the foregoing to G. A Montgomery, Superintendent A.C. and H. B. Ry., at whose request it was prepared by C. Fitzsimon, Superintendent Telephone Construction.

Telephone Train Dispatching.

By A. Dwight Smith.

[This is the fifth of the series of articles on this subject, the previous ones having been published in our issues of Sept., Oct., Nov. and Dec., 1911.]

In addition to the regular telephone equipment in everyday use on train dispatching circuits, conditions to be met with are such that various types of auxiliary apparatus are also required. The most troublesome of all auxiliary apparatus are the protective devices. It is fairly safe to say that no perfectly satisfactory protector has yet been developed by anyone. It has not been because of the lack of thought nor engineering ability, but because two irreconcilable conditions exist in telephone protection, and so far have rendered the problem unsolvable. The protector (fig. 1) must guard the apparatus from low voltage crosses, such as lighting and power wires, as well as from lightning. It must therefore operate at a low potential. When built with this in view,

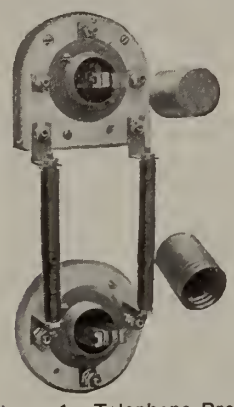


Figure 1. Telephone Protector.

Fig. 2. Knife Switch Test Panel.

the ground plate is in all cases so near the live plates that the spark-gap between is easily crossed by foreign matter, carbon dust, metal, or whatever material the plates are made of. This, of course, grounds the line permanently and renders it inoperative from noise, if there are any telegraph or power circuits in close proximity. If the plates are placed at a greater distance apart, the operating voltage is much higher, and the apparatus is not, therefore, protected as it should be. It has not been possible to solve this protection as yet, but since the railway's main object is to give service and they cannot stand for continued interruption to it from grounds on the protectors, it seems probable they will dispense with so much protection and take a chance of having the apparatus burned out occasionally rather than interrupt service so frequently from grounds.

Protectors which place permanent high resistance grounds on the line are, of course, useless for telephone purposes on account of the noise they bring into the circuit, aside from other disadvantages such as slowness in dissipating a charge.

If a road is equipped with more than one telephone circuit or has two additional telegraph wires suitably transposed, it is very desirable to make simple tests and patches, such as are accomplished on the peg switchboard in telegraph service. Fig. 3 shows a simple form of patching panel, which consists of five knife switches so arranged that if trouble occurs on the train wire, it is possible to patch around it by using the other available wires, and thus continuing the service until the cause of the trouble is removed.

When there is only one circuit installed along the road and no provision has been made for altering existing telegraph circuits, it is merely looped through three knife switches at each way station. Fig 3 illustrates this. With this simple arrangement, it is possible for the dispatcher to locate trouble between any two stations by successive tests down the line; opening the circuit in one direction and then in the other, and finding thus where the trouble is. In case of trouble in the station apparatus, that station can be cut off the line by the third switch, leaving the circuit cut straight through.

A portable train set, as used on wreck and regular trains, is shown in figs. 4 and 5. The first of these is a large size magneto set equipped with a 5-bar generator and has most efficient construction throughout. This set is generally used when the dispatcher is provided with an extension bell and can be rung up in case of his absence from his desk. The other set is practically the same in construction, but does not contain the generator or ringer, as on most train wires the dispatcher is continually on the circuit and no signalling device is necessary. The Canadian Pacific Ry. has approximately 750 of these sets in use. It is equipped with a head receiver so that the train conductor can have free use of both hands to copy his messages. To connect a portable set to the wire, a line pole is used, generally in three sections, and equipped with 100 ft. of flexible cord. A portable set is a wonder-worker for efficient train service, as communication can be immediately established between a distant point and headquarters.

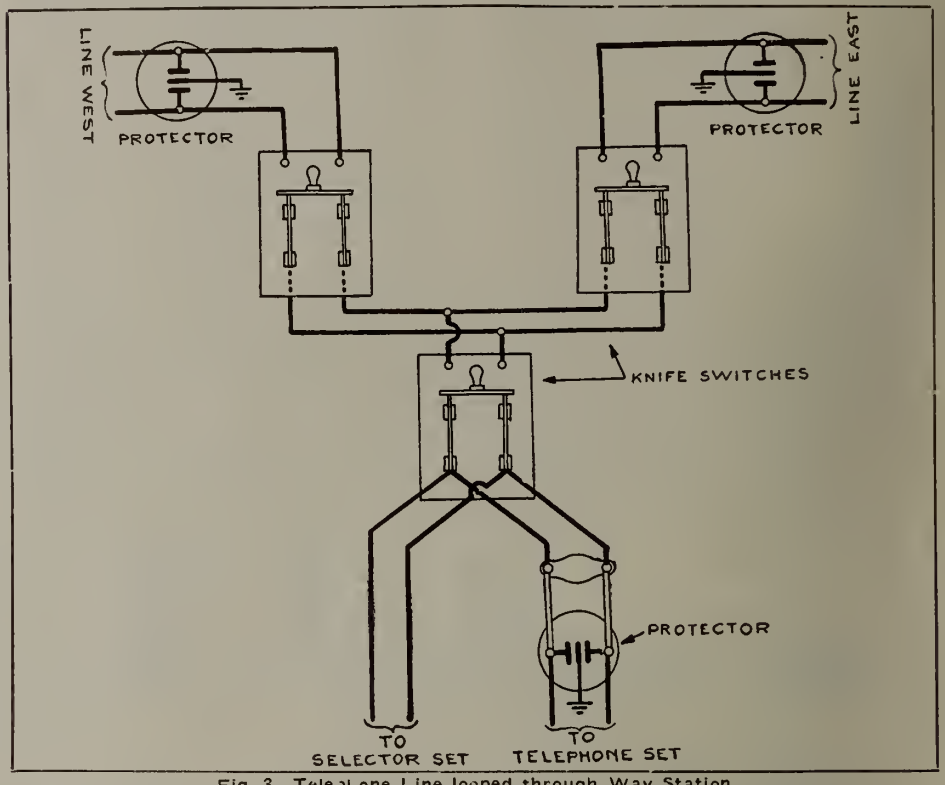


Fig. 3. Telephone Line looped through Way Station.

Fig. 4. Magneto Portable Train Telephone Set.

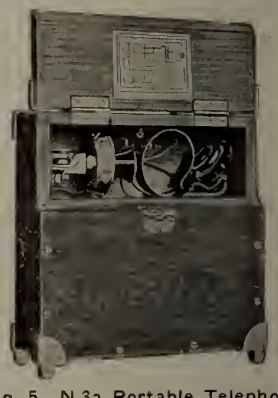


Fig. 5. N.3a Portable Telephone Set.

Since the development of the telephone for train dispatching, the need has been felt for signalling equipment which could be used and operated in connection with the telephone train wire, that is, instead of having a selector on a telephone circuit ring a bell at a way station, it was required that it throw a semaphore arm. On steam roads it is used exclusively for train order work, in other words, it is employed as an auxiliary to a regular dispatching circuit. When used in this way, it will secure a still further saving than is now effected by the telephone.

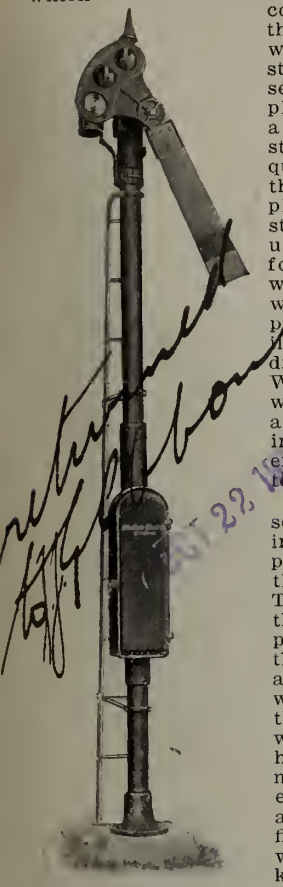


Fig. 6. Selectively Operated Semaphore.

A train order semaphore can be installed at any point desired along the right of way. The dispatcher can throw it to "stop" position at will by the same operation as when calling a way station. On the average railway equipped for handling train movements by telephone, there are a number of offices along it which have to be kept open 24 hours a day and where three tricks of operators must necessarily be employed for this purpose, merely to take care of a small number of trains. Of course, during the busy hours, it is necessary to have an operator on duty at the station, but at night or during very light load periods, there are numerous cases where he could be dispensed with altogether, provided the dispatcher had some means of reaching the trains.

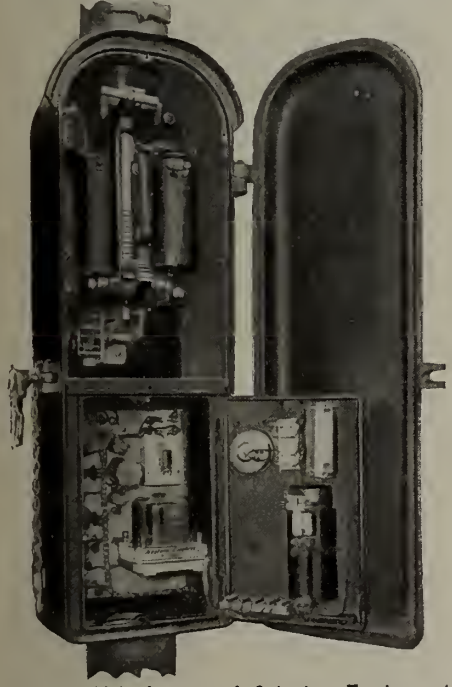


Fig. 7. Telephone and Selector Equipment.

Fig. 6 shows the semaphore complete. It is of standard make and is furnished with either upper or lower quadrant types as desired. A three spectacle casting is provided. Semaphore, selector and telephone equipment are all mounted on the same iron post and the apparatus is self contained. The box is locked with a standard switch lock so that access is only obtainable by the proper parties.

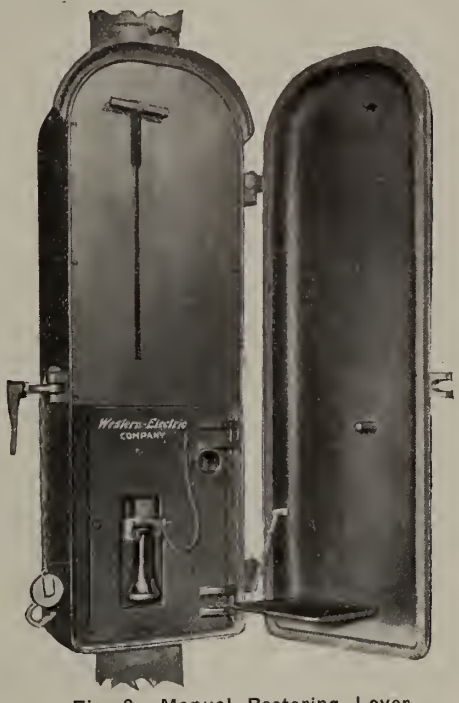


Fig. 8. Manual Restoring Lever.

Fig. 7 shows the pole casting containing signalling mechanism, the telephone and selector equipment. The semaphore equipment is of the electrically operated type and is manually restored. The relay operating this is normally de-energized and 10 dry cells are required for its operation. As the relay will operate on four cells, it is obvious that an ample margin of current is allowed. The signalling mechanism proper is contained in the compartment at the top of the casting; the only part of this which appears on the surface on the inside door is the handle of the restoring lever. The selectors and terminals are readily accessible for maintenance purposes.

Fig. 8 shows the apparatus casting with the inside cover open. In this illustration will be seen the arrangement of the selector and terminal apparatus. The signalling mechanism is shown above together with the manually operated lever and the gears by means of which the semaphore blades are restored to "clear" position. All equipment is bridged across the telephone line, and any piece of apparatus can be removed without affecting the circuit. As many semaphores as desired can be installed either on a new line or on present existing circuits.

The flexibility of a railway telephone system for handling train movements and commercial messages is obvious from the foregoing. When these features are added to the many other advantages of the personal method of communication, it is small wonder that the telephone is advancing into its new field with rapid strides.

F. H. Frobert, Roundhouse Foreman, Intercolonial Ry., St. John, N.B., in remitting his renewal subscription, says: "I find the Railway and Marine World very valuable in my position."

Canadian Car and Foundry Co.'s Annual Report.

The report for the year ended Sept. 30, 1911, shows profits of $1,007,137.58, which after deducting 7% dividend on preference stock, $385,000, leaves a surplus of $622,137.58. Out of this a common stock dividend of 4% has since been declared, leaving a surplus of $467,137.58 out of the year's earnings, being about $23,000 greater than for the previous years.

The gross sales for the year were over $12,500,000, being a considerable increase over the previous year; however, the serious trade depression in the United States, particularly in car equipment lines, necessitated a reduction in the percentage of profit on sales, as U.S. manufacturers in many cases sought business at bare manufacturing cost, or less, in order to maintain their organizations. A large proportion of the materials entering into car construction have to be imported into Canada and the freight and duties payable on such materials largely offset the protection afforded by the duties on finished products.

At the close of the fiscal year the unfilled orders on the books amounted to over $5,000,000.00. On Nov. 20 they amounted to approximately $10,000,000.00; and while, on account of the depression in the U.S., much of this business has been taken at rock bottom prices, it should practically ensure continuous operations at capacity for 1912 and a large saving in running expenses.

The increasing general prosperity of Canada, coupled with the demands of the railways for the company's products, easily make manifest the fact that the manufacturing facilities must be increased. This was particularly the case in respect to passenger car equipment and also by the increasing demand for freight cars of steel or steel underframed construction. The directors authorized extensions to the passenger car departments at Amherst and Turcot (Montreal); a new steel freight car department added to the Turcot works, an addition to the steel car plant at the Dominion works, and an extension to the malleable iron foundry at Amherst. These improvements are now all under way and steel underframed cars are being built at the Turcot works. The total cost, upon completion, will be approximately $350,000. The directors believe that this expenditure will be fully justified by results and will enable the company to more fully meet the railway requirements at all times.

Shortly after the organization of the company, it became apparent that facilities would have to be arranged for the production of steel castings which are entering more and more largely into the products. Early in 1911 it was found possible to secure the properties of the Montreal Steel Works, Ltd., and the Ontario Iron & Steel Co., Ltd., of Welland, Ont., the former being the largest producers of steel castings in Canada, the latter having both a steel foundry and a rolling mill. The Montreal Steel Works had also commenced the erection of a modern steel casting plant in Montreal in addition to its existing facilities. After careful consideration the directors deemed it wise to secure these properties and the Canadian Steel Foundries, Ltd., was formed for that purpose.

It was found advisable to make extensive improvements at the Welland plant. The new plant at Montreal will not be fully completed and ready for operation until the spring of 1912.

The directors were re-elected. The principal officers for the current year are:—N. Curry, President; W. W. Butler, Vice President; V. G. Curry, Second Vice President.

Efficient Shop Operation.

By E. T. Spidy Assistant to General Locomotive Foreman, C. P. R. Winnipeg.

In this paper I propose to bring out some of the various points that go to made an efficiently operated shop, and to make a few notes on each. Not very long ago the whole business of shop efficiency was considered part of the foreman's duties and it is mainly due to the demand for increased output that the shop engineer is now a recognized necessity to relieve the foreman of that part of his work relating to machinery upkeep, tools, and general improvements. The foreman is the man on whom the responsibility of the individual shop rests. He is the hub, as it were and the smooth working of all the minor wheels depends on his ability as an organiser, and on the amount of co-operative effort he receives. The first point I would draw your attention to is shop organization. By shop organization I mean the plan of control by means of which the whole work of a plant is divided and sub-divided among foremen and chargehands, that the responsibility for any particular detail can be instantly located. The organization of any shop is governed by its size, the class of work handled, and the conditions met with, peculiar to itself. Obviously no definite rules can be laid down. A shop may be organized to specialize as much as possible, or specializing might be impracticable. For example, take a locomotive erecting shop, in one shop we see that the gang boss has the entire erecting of an engine to look after from stripping to finishing, while in another shop we see the chargehand concerned with the general erecting alone, while a special gang strips the engine, another gang is responsible for shoe and wedge work, another for motion, and so on, that the whole work is in the hands of men who become specialists at their work. In a small shop the amount of specializing that can be carried on these lines is minimized, but even here, we see in some shops that a certain man always does the same job on an engine and so becomes a specialist on that particular job.

In manufacturing shops operated on a modern piecework or bonus system the introduction of functional foremen has proved successful. These functional foremen are additional, and they are responsible for certain functions of the shop that can be better handled by men who become experts, than by the regular foremen. In a piecework shop specializing becomes a necessity, it enables the keeping of more accurate records. By dividing the work among specialists each man becomes independent of the rest, for he alone gets all the benefit of his increased efforts, whereas when the whole gang work together, the whole gang have to carry the slow men, and this is the cause of much dissatisfaction. Good shop organization has each man's duties very clearly defined. This clear defining of every man's duties is essential to economic operation.

A point I would make special reference to is standardization. Just how far standardization should be carried into a shop is hard to say, but it is one of the items that brings down costs, so is well worth considering. Hand and machine tools should be standardized as far as possible, as also should be the method of handling the same. All tools required should be handed to the men from a central distributing room situated as near the centre of the shop as possible. Machine tools should be forged in the smithy-shop and taken to the tool room, where they are ground ready for hardening. The toolroom itself should be equipped with a hardening furnace for machine tools, and an oven for hardening taps, dies, reamers, etc., that require careful treatment. Tools such as taps, reamers, jigs, etc., should all be checked against the man receiving same. A system of giving each man so many checks when he enters the service and making him deliver one check for each tool received from tool store, keeps a tab on all tools, and placing the check where the tool came from simplifies the location of the tool, should it be called for by anyone else. All tools should be called in periodically that their condition may be observed and to keep stock up to date. All pneumatic tools should be brought in regularly for inspection and oiling, and if suspended in benzine they will be also thoroughly cleaned.

Machine tools should, as previously stated, all be ground in the tool department by a man kept especially for the job. Lathe tools have a definite shape and all angles of lip and clearance are fixed to a standard. For roughing tools the clearance angle, that is the angle behind the cutting edge, is six degrees. Some English standards reduce this a little, but six degrees is the standard on this continent. The back slope and side slope are respectively eight and 14 degrees. These angles are accepted standards, they represent part of results obtained by experiment and modern practice on heavy duty machines. Boring mills do not have a tool of the same height as lathes and the back and side slopes are usually reduced a few degrees. Planer tools reduce on the clearance angle and have only two degrees. This gives a stiffness behind the point of the tool and supports it on entering the metal, and also reduces the tendency to chatter. All tools used on machines, whether they are roughing, finishing, knife, or parting tools, can be handled better by a separate department such as the tool room, than by individual workmen.

The reason for the many shapes of tools found in a shop, not systematically handling the same, is that instead of being the result of each man's experience, it is merely the result of custom, the difference between which is very obvious. The same applies to the tool smith. It used to be bad policy to fall out with the man who hardened your tools, anybody who has ever worked under that system knows why, however, with the smith fully acquainted with the methods of treating the many different kinds of steel he is called on to do in these day, it is reasonable that if he does his work in quantities at one time, instead of one of this, and one of that, while somebody waits on him, he will turn out better and more work and get more satisfaction out of it as well.

Driving wheel lathe tools are all special shaped tools, however they should all go through the same process in handling. Considerable saving is claimed by the Montreal Locomotive Works on large finishing tools by welding a piece of high speed steel into a billet steel shank. The cost of such tools is very small compared with solid high speed tools of the necessary heavy section. The same process was tried at the C.P.R. shops in Montreal. Whether it was the hard tires or not I do not know, but I believe the success met with was not convincing enough for it to be adopted as a standard. Some smaller special tools, however, are high speed steel tipped right along. High speed steel used for tools used only occasionally represents capital tied up. If you can use your odd ends to tip special tools you are certainly getting better interest on your outlay.

While on the subject of machine tools, the question of standardization of tool steel comes up. This is a difficult matter to decide, especially as each steel maker claims that his is the best. No one wants inferior tool steel, so the only thing to do is to experiment ourselves with our own particular classes of material and determine what best suits us. Although it may be impossible to adopt a standard steel for all work, it can be be found better on a certain class of done so far that a certain tool steel will work. High speed steel forms a large expenditure item that makes this very desirable.

In connection with this work comes the efficient operation of the individual machines. Machine speeds have gone up during the past few years and the tendency is to go still higher. It is necessary to have a range of speeds on each machine suited to the class of work to be operated on. Take the case of drilling machines. Since the advent of high speed drills, the correct number of revolutions per minute has increased on an average 75% over the speed called for by carbon twist drills. The extra high speed or flat twisted drill which is being used on certain classes of work demands a speed 130% over the original speed for the same size of drill. Unless drills are run at the proper speeds they cannot work efficiently and so the value obtained is minimized. A machine to drill holes from ½ in. to 2⅛ in. needs a capacity from 50 to 500 revolutions a minute. High speed drills less than ½ in. diameter call for higher speeds than 500 revolutions a minute, but unless the machine is of modern design it is inadvisable to go above this, for the vibration set up not only racks the machine to pieces in a short time, but makes true holes difficult to obtain, and breaks many drills. Twist drills should never be used in cored holes, for flat drills, made out of odd ends of high speed tools, will do the work far better, and be very much less expensive.

Feeds for drills vary with the metal drilled. Taking medium cast iron, a basis for a high speed drill is .01 in. per revolution, per inch diameter of drill, this, however, cannot be considered more than a guide. Records given at the Master Mechanics' Convention this year in Atlantic City show that feeds of one-tenth of an inch per revolution at 575 revolutions per minute were obtained in cast iron billets with a 1¼ ins. drill removing metal at the rate of 70.55 cub. ins. a minute. This, of course, is phenomenal and was made under ideal conditions. Cutting speeds on lathes, boring mills, etc., have also increased and tend to increase with each improvement in tool steels. It is impossible to do more than make an average statement of what speeds should be used on various metals, owing to the many variable elements to be considered that influence the same. The size of the tool and the quality of the tool steel, the capacity of the machine, the material operated on, the depth of cut taken and the feed employed all influence the cutting speed. It must be granted that there are certain combinations of these elements that are better suited to each job than others, but to determine the correct combination to remove a certain amount of stock in the most efficient manner necessitates a detail study of the machine from a power standpoint and also an intimate knowledge of each condition to be met. It is considered best practice to remove the necessary metal in one or two cuts, according to the amount to be removed, and to use the heaviest feed practicable in connection with available speeds. The size of the tool is set to some degree by the machine and in experimenting with tools up to 1¼ in. in width they should be figured to stand 30 minutes maximum cutting before signs of failure. Careful experiment will afford much information on the relations between these elements and will give some accurate idea of what can be expected from each tool. Modern lathes, 6 in. centres, require 5 h.p. to drive, while a 24 in. centre lathe needs 30 to

40 h.p. to keep going, the latter power being necessary with two tools in operation. Stroke machine speeds have risen in line with other machines. Modern high speed planers have cutting speeds from 30 to 90 ft. per minute with a return speed 200 ft. per minute. The development of electrical reversing gear is an indication of progress.

Milling machines are a great asset in a manufacturing shop, especially where any amount of duplicate work is done. An average cutting speed is about 70 ft. per minute, but this, of course, is dependent on the stock being removed. Feeds vary from ½ in. per minute to 20 in. or more, dependent on the work also.

Grinding machines are now an asset to railway shops, and are almost indispensable. They take work roughed out in other machines and finish it quickly and accurately. Grinding is in reality milling on a finer scale. Motion pins and shafts make a cheaper and better job than a lathe. A wheel 25 ins. diameter running at 5,000 ft. per minute gives good results. At the C.P.R. Montreal shops, new piston rods are rough turned in the lathe only, the body is ground to size removing 1-32 in. of diameter with a wheel running at 5,000 ft. per minute. The rod is rotated at 20 revolutions a minute, while the traverse of the wheel on the rod is 38 inches a minute. This entirely dispenses with the rolling operation.

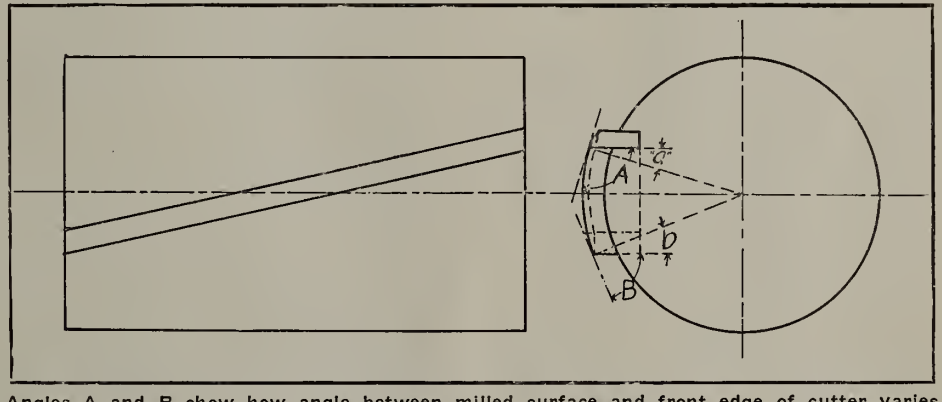
A large amount of taper reaming is done in connection with locomotive work, but very little advantage seems to have been taken, so far, towards getting better tools than have been in use for many years. The straight fluted reamer may be all right for parallel holes, but for taper holes the spiral reamer is superior to all others, long or short. The straight fluted reamer has to take a cut its whole length at one time by a drag or scrape process. The cutting action here is weak, for the length of the shaving prevents little more than a scrape being taken. The eccentric fluted reamer has an advantage of not chattering and is superior to the ordinary equal fluted reamer, but with a spiral reamer we have a shearing action by means of which a cut is started at one point and carried until it leaves the edge of the tool. Spiral reamers should be made left handed, so that the tendency is to draw itself from the hole, and not into the hole. This left handed spiral will also, by the same tendency, clear itself of the chips, and will not clog nearly so much as the straight fluted reamer. The benefit of the spiral reamer is also shown in the fact that the power required to drive it is much less than with the straight fluted type of the same size. If these are made of high speed steel they will do better service still. Although they are most costly to make the saving will warrant the expenditure easily.

Milling cutters come in the same class as reamers. The practice of using inserted toothed milling cutters for the larger sizes is almost universal. Billet steel makes an ideal centre and the blades should be made from old high speed machine tools forged to proper dimensions and machined to fit the grooves in the body. The grooves in the body are cut at an angle to the axis, so as to approximate the ideal as nearly as possible, the ideal being of course the spiral. The blades are fitted and lightly caulked in place, and then turned over the top to requisite diameter, to be afterwards removed and hardened, and then replaced and ground. The straight blade cutter, however, has a disadvantage, not met with in a spiral milling cutter, which is rather difficult to overcome. It will be seen that the clearance lip in front of the cutting edge touches the work at varying angles throughout the length of the blade, so that if the blade is set that its centre has the correct clearance lip, one end will have excessive lip, and the other a minus lip that results in a drag action at that end of the cutter. This also produces uneven strains which not only tend to loosen the blades, but which puts the whole cutter out of action just as soon as the weakest portion, which is where the scraping takes place, becomes dull. It is possible to set the blades back from the axis that there is always a cutting lip, but then the excessive lip at the other end is increased. Not much attention has been paid to this point until recently. A shop I am acquainted with now mills the entire face of the blade that projects from the body. This obviates the evil entirely and makes the tool an equivalent of a solid spiral milled cutter. The practice of making solid plain milling cutters entirely of billet steel is an economic one where the metal to be removed is of even character and not very hard, and is to be recommended, especially on new work of a straightforward nature. These tools are made precisely the same as any other cutters with spiral flutes, but are casehardened as deeply as possible. Axle steel or any high carbon steel will make admirable cutters if case-hardened properly.

The standardization of shop methods is a question that has not been very seriously considered in railway shops, until very recently. It is an essential feature in shops run on a scientific basis with piece work or bonus system in vogue. No one would argue that there is not a best method of doing a job, and if a means is secured whereby it is possible to find the best method and to maintain it, there is no room for doubt that considerable saving is effected. With new work the standardization of methods can be accomplished without very great difficulty, but even with repair work considerable can be done in merely definitely establishing the method of repair and the route the work is to take through the shop. The cost of getting the necessary records for this purpose is more or less high, because it entails a scientific investigation of each move by the operator and the condition under which he works. Just as a scientist, who, in order to solve any complex problems analyses each and every detail of the case very minutely, so must the same principle be applied to each operation performed in the shop, that details, insignificant in themselves, may be brought to light and studied as to whether they are essential to the job or not, and if they are, that they are being performed as efficiently as possible. This investigation obviously necessitates a man trained in the work, for it is beyond the foreman entirely to spend the time or to get the information requisite. The handling of material from shop to shop, and from machine to machine is also now brought down to a science. By a schedule system, locomotives shopped for repairs are ordered out by a certain date, in consequence of which every detail is scheduled to be repaired and replaced on the engine to conform with this date. This scheduling of work is comparable to the scheduling of trains, the dispatcher knows the location of all his trains and when they are due at the next point, accordingly he moves everything to ensure continual running and to avoid confusion. With this basis in our shop similar control is obtained.

To have an efficiently operated shop it is necessary to maintain a high standard of repair on every machine. Belts must not be neglected and a system should be employed to enable the belt man to be located at all times. The class of hoist each man has at his command is of importance, and wherever practicable individual hoist service is to be recommended. Jigs, labor saving devices, or ideas should be encouraged and advantage should be taken of the kinks put forward in our technical journals to reduce shop expense.

The foregoing is only the material side of the question of shop efficiency. It needs the co-operation of the whole staff to get results, and it has no place for a man who does not take a lively interest in every detail intended for the benefit of his shop. The co-operative effort of every workman is desirable. The object in view is to bring the conditions affecting the shop to a point as unvarying as possible. So that the greatest advantage is taken of modern facilities, and the abuse of the same is minimised. In short, to use the words of a well known efficiency engineer, "Our object is to get the right job done on the right machine, in the right manner, by the right man and at the right time." When we achieve this we shall have an efficiently operated shop as far as the human element can make it.



Angles A and B show how angle between milled surface and front edge of cutter varies at each end of blade. Angle A is actual clearance lip at one end. Angle B is the minus lip that causes scraping.

The foregoing paper was read before the Western Canada Railway Club recently.

Railway Lands Patented.—Letters patent were issued during Oct., 1911, in respect of railway lands in Manitoba, Saskatchewan, Alberta and British Columbia, as follows:—

	Acres.
Canadian Northern Ry.	12.38
Canadian Pacific Ry.	361.59
Grand Trunk Pacific Ry.	219.65
Qu'Appelle, Long Lake and Saskatchewan Rd. and Steamboat Co.	639.00
Total	1232.62

A. J. Shapter, engine tester, G.T.R., Montreal, writes:—"I am well pleased with The Railway and Marine World."

The prize of $1,000, recently offered by Sir Thomas G. Shaughnessy, President, C.P.R., for the best sample of wheat grown on the continent, has been won by S. Wheeler, Roathan, Sask. The alternative exhibit was by W. J. Glass, Macleod, Alta.

Orders by the Board of Railway Commissioners.

Beginning with June, 1904, we have published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed our paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates given of orders, immediately following the numbers, are those on which the hearing took place and not those on which the orders were issued. In many cases orders are not issued for a considerable time after the dates assigned to them.

15390. Nov. 16.—Authorizing B.C. Public Works Department to build highway crossing over Shuswap and Okanagan Ry. (C.P.R.) at Grindrod station.

15391. Nov. 15.—General order re cartage limits at cartage points.

15392. Nov. 15.—Authorizing V.V. & E. Ry. to cross C.P.R., Vancouver Power Co.'s line, and highway, and also authorizing two overhead and one grade crossing of highways in New Westminster District, B.C.

15393. Nov. 15.—Approving location and plans of G.T.R. station at Maxville, Ont.

15394. Nov. 14.—Ordering G.N.R. to build spur to W. H. Haight's premises, Pipers Siding, B.C., and to file tariffs on fertilizer from Vancouver and New Westminster to said spur. This order is given in full on another page.

15395. Nov. 16.—Approving G.T.R. bylaw authorizing J. E. Dalrymple, Vice President, C. A. Hayes, F. T. M. and H. C. Martin, G.F.A., to issue tariffs of freight tolls.

15396. Nov. 16.—Authorizing G.T.P.R. to divert road in n.e. ¼ sec. 26 and s.e. ¼ sec. 35, tp. 35, r. 14, w. 3 m., Sask.

15397. Nov. 16.—Authorizing C.P.R. to build double track across 17th Ave. and to close portion of 18th Ave., Moose Jaw, Sask.

15398. Nov. 16.—Ordering T.H. & B.R. to install within 90 days, improved type of electric bell at Wellandport road, St. Annes, Ont., 20% to be paid from railway grade crossing fund.

15399. Oct. 24.—Extending express delivery and collection limits in Walkerville, Ont.

15400. Nov. 17.—Ordering C.P.R. not to exceed 10 miles an hour over crossing two miles east of Montreal Jct.

15401. Nov. 15.—Authorizing C.P.R. to cross with its Lacombe Easterly branch, 25 highways in Alberta.

15402. Nov. 17.—Authorizing C.N.O.R. to cross C.P.R. near Nipigon.

15403. Nov. 14.—Authorizing G.T.R. to rebuild bridge at mileage 59.40, near Palgrave station, Ont.

15404, 15405. Nov. 16.—Authorizing G.T.P. Branch Lines Co. to cross and divert highway at mileage 112, Sask., and to divert road on its Regina-Boundary branch.

15406. Nov. 17.—Authorizing Kettle Valley Ry. to build bridge at first crossing of Kettle River, north of Midway, B.C.

15407. Nov. 18.—Authorizing G.T.R. to build spur into Harris Coal Co.'s premises, Coxwell and Rhodes Aves., Toronto.

15408. Nov. 17.—Authorizing Midland Ry. of Manitoba (G.N.R.) to cross C.P.R. spurs in Winnipeg at five points.

15409. Nov. 18.—Approving detail plans of abutment and wing wall of Church St. subway, Mimico, Ont.

15410. Nov. 16.—Authorizing Ottawa Electric Co. to erect wires across C.P.R. on Carruthers Ave.

15411 Nov. 17.—Ordering Dominion Ex. Co. to restore as special tariff its Standard Tariff C.R.C. 15 from 26 to 170 miles in effect prior to Oct. 15, 1911, and define more clearly the points between which it shall apply on complaint of W. J. Guest Fish Co., Winnipeg, re increased rates on fresh fish, Gimli to Winnipeg.

15412. Nov. 20.—Ordering C.N.R. to complete by June 1, 1912, suitable stock yard accommodation at Englefeld, Sask.

15413. Sept. 26.—Stating conditions under which milk cans may be shipped in baggage cars after Oct 1. This order is given in full on another page.

15414. Nov. 21.—Approving revised location of G.T.P.R. station at Cans, sec. 9, tp. 22, r. 5, w. 2 m.

15415. Nov. 20.—Authorizing C.N.R. to cross public road on its Swift Current extension, Sask.

15416. Nov. 15.—Authorizing C.P.R. to build spur into W. C. Edwards Co.'s premises, Nepean tp., Ont.

15417. Nov. 21.—Approving detail plans of subway under C.P.R. at 11th Ave., Moose Jaw, Sask.

15418. Nov. 22.—Authorizing C.N.O.R. to divert Otter Creek and build bridge over it, in South Elmsley tp., mileage 50.1 from Ottawa.

15419. Nov. 20.—Authorizing C.N.O.R. to divert Opinicon Road by overhead bridge, Loughborough tp.

15420. Nov. 20.—Authorizing G.T.P. Branch Lines Co. to cross and divert highway mileage 108.6 to 108.9, Prince Albert branch, Sask.

15421. Nov. 20.—Authorizing G.T.R. to operate over C.P.R. at Nipissing Jct., Ont., to a connection with T. & N.O.R., watchmen to be employed day and night, pending completion of interlocking plant.

15422, 15423. Nov. 21, 22.—Authorizing C.P.R. to expropriate certain lands for extension of yards, construction of machine shops, roundhouse, etc., at West Toronto, and land required for double track, at Perth, Ont

15424 to 15426. Nov. 22.—Authorizing G.T.P. Branch Lines Co. to divert road at mileage 22.2 Battleford branch to cross two highways on its Biggar-Calgary branch at mileage 80.8 and 85, and to cross six highways with its Cutknife branch.

15427. Nov. 22.—Approving revised location of G.T.P.R. station at Clavet, sec. 9, tp. 53, r. 3, w. 3 m.

15428. Nov. 21.—Authorizing G.T.R. to build two additional tracks across road allowance 25, con. 1, Himsworth tp., Ont., and to connect with Trout Creek logging spur.

15429, 15430. Nov. 21.—Approving revised location of C.N.O.R. Sudbury-Port Arthur line in Nipigon tp., mileage 68.58 to 69.53 and through unsurveyed territory, mileage 194.52 to 203.24 from Sudbury Jct.

15431. Nov. 21.—Authorizing C.N.R. to open for traffic part of its Maryfield extension from Radville to Bengough, Sask., 45 miles.

15432. Nov. 22.—Authorizing C.N.R. to cross public road on its Prince Albert-Battleford line, Sask.

15433. Nov. 21.—Authorizing C.P.R. to use bridge 32.7 on its Lardo subdivision, B.C.

15434, 15435. Nov. 21.—Authorizing C.P.R. to build spur to Yahk Lumber Co., East Kootenay District, B.C., and to operate additional track across road allowance at Hillcrest, Alta.

15436. Nov. 22.—Authorizing C.P.R. and C.N.R. to operate over completed interlocking plant in n.e. ¼ sec. 18, tp. 16, r. 13, w.p.m., Sask.

15437. Nov. 22.—Approving Bedlington and Nelson Ry. (G.N.R.) bylaw authorizing H. A. Noble, G.P.A., St. Paul, Minn., to issue tariffs.

15438. Nov. 22.—Authorizing city of Calgary, Alta., to carry its municipal railway over C.P.R. at 12th Ave., near 6th St.

15439. Nov. 21.—Authorizing C.P.R. to use bridges 101.1 and 84.6 on its Thompson subdivision, B.C.

15440. Nov. 21.—Authorizing C.P.R. to expropriate lands for new building and yard room, near Aroostook Jct. on New Brunswick Ry.

15441. Nov. 22.—Rescinding order 15251 Sept. 14, re C.P.R. train service at Moosomin, Sask.

15442, 15443. Nov. 22.—Authorizing C.P.R. to build spur for Standard White Lime Co., from Ingersoll subdivision at mileage 5.28, West Oxford, tp., Ont., and to build spur for Leitch Colleries at Passburg, Alta.

15444. Nov. 22.—Authorizing C.N.R. and C.P.R. to operate trains, without coming to a stop, over interlocker at Stettler, Alta.

15445. Nov. 22.—Approving revised location of Algoma Eastern Ry. and diversion of trunk road at mileage 34.75, with approval of Ontario Government.

15446. Nov. 22.—Authorizing Alberta Central Ry. to cross highway at mileage 10.10.

15447. Nov. 20.—Rescinding par. 1 of order 11812, Sept. 19, 1910, re expropriation by G.T.P.R. of M. Keilty's land, Edmonton, Alta.

15448. Nov. 7.—Ordering Napierville Jct. Ry. to build station at Delson Jct., Que., within two months with leave to occupy G.T.R. and C.P.R. lands which may be necessary to serve travelling public.

15449. Sept. 15.—Authorizing Winnipeg Electric Ry. to cross C.P.R. Selkirk branch on Selkirk Ave. and McPhillips St., interlocking plant to be installed.

15450. Nov. 21.—Ordering G.T.R. to build foot subway at Wilson and Norfolk Sts., Guelph, Ont., cost to be paid by city, and any dispute to be referred to the Board.

15451. Nov. 7.—Ordering C.P.R. to protect G.T.R. crossing, north of Woodstock, Ont., by interlocker.

15452. Nov. 24.—Rescinding order 15221, Oct. 27, re interlocker to be installed at Pages, Ont., by C.P.R. and G.T.R.

15453. Nov. 20.—Authorizing C.N.R. to cross with its Vegreville line 12 highways in Alberta.

15454. Nov. 18.—Authorizing C.N.O.R. to build across farm road and creek on lot 20, con. 2, Camden tp.

15455. Nov. 24.—Approving location and plans of C.P.R. station at London Yard, Ont.

15456. Nov. 22.—Ordering Atlantic, Quebec and Western Ry. to provide undercrossing for A Shannon, Breche a Manon, Que.

15457. Nov. 25.—Relieving C.P.R. from further protection of crossing, 1¾ miles north of Brigham Jct., Que.

15458. Nov. 25.—Authorizing C.P.R. to build double track across highway near 1st Ave., Port Arthur, Ont.

15459. Nov. 25.—Approving Alberta Central Ry. location, mileage 194.6 to 220, east from Red Deer.

15460 to 15462. Nov. 25.—Authorizing James Bay and Eastern (C.N.R.) to cross three public roads in Demeules and Ouiatchouan tps., Que.

15463. Nov. 25.—Ordering C.N.R. to complete draining cattle pass on Y at Ochre River, Man., before June 1, 1912, under penalty of $10 a day.

15464. Nov. 24.—Relieving G.T.R. from further protection of crossing west of Burlington Jct., Ont.

15465. Nov. 24.—Substituting word "construct" for "reconstruct" in order 15116, Oct. 11, re bridge at Bull River Bridge on Kootenay Central Ry., B.C.

15466, 15467. Nov. 23.—Authorizing C.P.R. to build spur for Sovereign Lime Works, near Angus station, Montreal, and extend spurs for Manitoba Glass Mfg. Co. on s.e. ¼ sec. 36, tp. 12, r. 7, e.p.m.

15468 to 15470. Nov. 23.—Authorizing C.P.R. to build spur for city of Calgary, Alta., across road allowance and city's existing spur; also spurs for Gordon Nail Co., Calgary, Alta., and Austin and Nicholson, in tp. 37, Algoma District, near Brunel station, Ont.

15471. Nov. 25.—Authorizing C.P.R. to build double track across C.N.R. in Carberry, Man., at mileage 105.6 Brandon subdivision.

15472. Nov. 23.—Re C.P.R. switching rates at Prescott, Ont. This order is given in full on another page.

15473. Nov. 17.—Dismissing application of Canadian Freight Association for approval of proposed local freight tariff of charges for use of refrigerator cars west of Port Arthur.

15474. Nov. 25.—Suspending, sine die, tariffs of C.N.R. and Ottawa and New York Ry., re baggage of excess size until all parties can be heard.

15475. Nov. 24.—Ordering C.P.R. on or before Apr. 1, 1912, to maintain permanent station agent at Winnipeg Beach, Man.

15476, 15477. Nov. 27.—Authorizing Alberta Central Ry. to build bridges across Red Deer River at mileage 5.93 and North Saskatchewan River at Rocky Mountain House, mileage 61.5.

15478 to 15480. Nov. 27.—Authorizing C.P.R. to rebuild bridges 43.3 over Upper Lachine Road, Farnham subdivision near Rockfield, Que., and 18.8 and 19.1, Ottawa subdivision.

15481. Nov. 25.—Approving C.N.O.R. revised location at Stonehouse Lake, Storrington tp., mileage 174.67 to 175.35 from Toronto.

15482. Oct. 12.—Authorizing C.N.O.R. to build across public road between cons. 7 and 8, Georgina tp.

15483, 15484. Nov. 27.—Approving location of C.N.O.R. station grounds at mileage 174.5, Storrington tp., and at Chaffey's Locks, South Crosby tp.

15485. Nov. 27.—Authorizing C.N.O.R. to build spur to rolling mills across Bay St., Belleville.

15486. Nov. 27.—Authorizing G.T.P.R. to build across and divert highway in n.w. ¼ sec. 5, tp. 25, r. 10, w. 2 m., Sask.

15487, 15488. Nov. 27.—Relieving G.T.R. from further protection at crossings of Beach Road in East Hamilton, and at Pikes Side Road, 1¼ miles west of Strathroy station, Ont.

15489 to 15492. Nov. 25, 28.—Authorizing C.P.R. to build spurs for W. J. Riley, n.e. ¼ sec. 28, tp. 12, r. 9, e.p.m., mileage 20.1 Lac du Bonnet Branch, Man., Ontario and Manitoba Flour Mills, McKim tp., Stobie Branch near Sudbury, Ont.; amending order 15389, Nov. 14, re spur to Martin Lenour Co.'s premises, St. Boniface, Man., and authorizing spur for National Brick Co., Laprairie, Que.

15493. Nov. 27.—Rescinding order 11264, July 18, 1910, re extending Brownlie St., Morse, Sask., over C.P.R., and authorizing C.P.R. to open and build Main St., over its line there.

15494, 15495. Nov. 27.—Approving change in location of C.P.R. station at St. Basil, N.B., and approving location of station at Westmount, Que.

15496. Nov. 28.—Authorizing C.N.O.R. to cross under C.P.R. at Smiths Falls.

15497, 15498. Nov. 27, 28.—Authorizing C.P.R. to build spurs for Imperial Oil Co., Wetaskiwin, and to ballast pit at Elcan, Alta.

15499 to 15505. Nov. 28.—Extending to June 1, 1912, time within which telegraph and telephone companies may charge tolls as

they were immediately previous to July 13, 1906.

15506. Nov. 28.—Relieving G.T.R. from further protection at crossing in Victoriaville Que.

15507. Nov. 28.—Ordering G.T.R. not later than Apr. 20, 1912, to build joint crossing between farms of J. A. Riddell and H. Dix, Williamsburgh tp., Ont.

15508, 15509. Nov. 27.—Ordering C.N.Q.R. to install gates at Joliette St, by July 1, 1912, 20% to be paid from railway grade crossing fund, and gates at Aylwin St., Montreal.

15510, 15511. Nov. 28, 20.—Authorizing G.T.P.R. to cross and divert highway at mileage 39.6 and 92.4, Sask.

15512. Nov. 29.—Correcting plan approved by order 12342, Nov. 21, 1910, in connection with centre line of G.T.P.R. Regina-Moose-Jaw branch.

15513. Nov. 30.—Authorizing G.T.P. Branch Lines Co. to cross and divert road at mileage 33, Sask.

15514. Nov. 30.—Authorizing G.T.R. to expropriate certain lands on east side of Elgin St. and north of Robert St., Hamilton, Ont.

15515, 15516. Nov. 30, 29.—Relieving G.T.R. from further protection at crossings in lot 11, Tecumseh tp., and about 2½ miles north of Cookstown, Ont.

15517. Nov. 30.—Authorizing C.P.R. to use bridges at mileage 65.7 and 87.2, Edmonton subdivision, Alta.

15518. Nov. 29.—Authorizing C.P.R. to build its Wilkie-Anglia branch across four highways in Saskatchewan.

15519. Nov. 30.—Authorizing C.N.R. to cross public road on its Prince Albert-Battleford line, Sask.

15520. Nov. 30.—Authorizing C.P.R. to cross with its Kerrobert Northeasterly branch, two highways at mileage 0.41 to 0.98.

15521. Nov. 27.—Ordering C.N.Q.R. to complete installation of gates at Nicolet St., Montreal, by July 1, 1912, 20% to be paid from railway grade crossing fund and 30% by the city.

15522. Nov. 29.—Authorizing C.N.R. to open for traffic its line from Warden to Drumeller, 63 miles.

15523. Nov. 29.—Authorizing C.N.R. to operate under Queen St. bridge, Toronto, until viaduct plans are settled.

15524. Nov. 29.—Authorizing Saskatchewan Public Works Department to build highway across C.P.R. between secs. 3 and 4, tp. 18, r. 32, w.p.m.

15525. Nov. 27.—Authorizing city of Sherbrooke, Que., to extend Meadow St. under G.T.R.

15526. Nov. 29.—Dismissing C.P.R. application to rescind order 605, July 25, 1905, re interswitching at London, Ont.

15527. Nov. 27.—Ordering C.N.Q.R., before Jan. 1, 1912, to submit plan for station in Maisonneuve, Que., station to be completed when Board directs.

15528. Nov. 30.—Authorizing C.N.O.R. to build bridge over Rideau canal at Chaffey's Locks.

15529. Nov. 29.—Authorizing city of Calgary, Alta., to build subway under C.P.R. at 9th Ave. east, between 15th and 17th Aves. east, 60% to be paid by city, and 40% by company.

15530. Dec. 1.—Amending order 14605, Aug. 17, which authorized Calgary and Edmonton Ry. to carry its main line over Edmonton, Yukon and Pacific Ry. in Edmonton, Alta., by a bridge, substituting Edmonton, Yukon and Pacific Ry. for applicant company.

15531. Dec. 1.—Amending order 15480, Nov. 27, by substituting rebuild for build.

15532, 15533. Dec. 1.—Approving revised location of C.N.O.R. Sudbury-Port Arthur line in Dorion tp., mileage 48.8 to 50.5 from Port Arthur; and at Pearl station, MacTavish tp., mileage 534.72 to 535.01 from Sudbury.

15534. Dec. 1.—Approving G.T.P.R. revised location from south line of sec. 3, tp. 52, r. 24, to west line of sec. 34, tp. 47, r. 28, w. 5 m., mileage 55.15 to 93.92.

15535. Dec. 1.—Authorizing G.T.P. Branch Lines Co. to cross with its Cutknife branch highways from s.e. ¼ sec. 36, tp. 43, to s.e. ¼ sec. 2, tp. 44, r. 17, w. 3 m., mileage 1.13 to 3, West Saskatchewan District.

15536. Dec. 1.—Authorizing city of Winnipeg to extend Sargent Ave. across C.P.R. Pembina branch.

15537. Dec. 1.—Amending order 15479, Nov. 27, by substituting rebuild for build.

15538. Sept. 14.—Naming express delivery and collection limits for Yorkton, Sask.

15539. Nov. 30.—Approving supplement 7 to Express Classification for Canada 2, in connection with order 15288, to take effect not later than Jan. 1, 1912.

15540. Nov. 25.—Ordering G.T.R. to amend Special Tariff on coal and coke from Rouses Point, N.Y., not later than Jan. 15, 1912 so as not to exceed certain rates.

15541. Dec. 1.—Authorizing C.P.R. to build two spurs for Canadian Copper Co., Copper Cliff, Ont.

15542. Nov. 27.—Approving amended plan for protection where G.T.R. crosses Montreal, Park and Island Ry. near Turcot, Que.

15543. Nov. 27.—General order 12542, Dec. 9, 1910, re blau-gas, by striking out subsec. c, par. 1.

15544. Dec. 4.—Authorizing C.N.O.R. to cross C.P.R. for construction purposes only, at east side of Rideau River, near Ottawa, watchman to be appointed by C.P.R. and paid by C.N.O.R.

15545. Dec. 4.—Amending order 15344, Oct. 31, which approved standard plans for pile and frame trestles for C.N.R. eastern lines, by substituting Montreal-Port Arthur line for eastern lines.

15546. Dec. 2.—Ordering that $5,000 be paid out of railway grade crossing fund towards cost of building subway under C.N.R. at 23rd St., Saskatoon, Sask.

15547. Dec. 1.—Authorizing G.T.R. to build spur into Twin Lake Lumber Co.'s premises, Parry Sound District, Ont.

15548. Dec. 2.—Authorizing C.P.R. to build bridge 1.43 over Kettle River, on Granby Smelter spur, B.C.

15549. Dec. 2.—Authorizing C.P.R. to build spur for Western Supply and Equipment Co., Calgary, Alta.

15550, 15551. Dec. 2, Nov. 30.—Authorizing C.N.O.R. to carry public road over its tracks on a structure at station 1131-3, Nipigon, Ont., and to cross creek at station 41-51, lot 22, Camden tp.

15552. Dec. 4.—Authorizing C.P.R. to build spur for G. R. Marnoch, Lethbridge, Alta.

15553. Dec. 1.—Authorizing C.P.R. to cross with its Quill Lakes branch, 29 highways in Manitoba.

15554. Dec. 4.—Authorizing G.T.R. to rebuild bridge 1, at milepost 8.06, District 30, Hawkesbury branch, Ont.

15555. Dec. 4.—Authorizing Niagara, Welland and Lake Erie Ry. to cross G.T.R. spur, on Muir St., Welland, Ont.

15556. Dec. 2.—Approving location of C.N.O.R station grounds at St. Hermas, Que.

15557. Dec. 4.—Authorizing C.P.R. to use bridges 21.7 and 22.5 on Moose Jaw subdivision, Sask.

15558. Dec. 5.—Ordering that flagman be maintained by C.P.R. at Talbot St., Winnipeg.

15559. Dec. 4.—Extending to Nov. 1, 1912, the time allowed under judgment for free return of empty packages by express companies prior to Mar. 1, 1911.

15560. Dec. 4.—Authorizing Noisy River Telephone Co. to erect wires across G.T.R. in Nottawasaga tp., Ont.

15561, 15562. Dec. 5.—Authorizing C.N.R. to cross with its Hallboro branch five highways in Manitoba and Saskatchewan, and to cross with its proposed second track, Pembina highway, Fort Rouge, Winnipeg.

15563. Dec. 4.—Approving plan of Spanish River Pulp and Paper Mills, Ltd., for tunnel under Algoma Eastern Ry. at Espanola, Ont.

15564. Dec. 6.—Authorizing C.P.R. to cross with its Regina, Saskatoon and North Saskatchewan branch, 32 highways and road diversion mileage 25.88 to 56.28, Sask.

15565. Dec. 6.—Authorizing G.T.P. Branch Lines Co. to operate spur from its Tofield-Calgary branch into Calgary Collieries, Ltd.

15566. Dec. 6.—Authorizing C.P.R. to build spur into Jewell Lumber Co.'s premises, East Kootenay District, B.C.

15567. Dec. 6.—Authorizing C.N.R. to cross public road on its Prince Albert-Battleford line.

15568. Dec. 6.—Authorizing C.N. Pacific Ry. to cross under Esquimalt and Nanaimo Ry. near Parson's Bridge, B.C., and rescinding order 12695, Jan. 5, which authorized similarly.

15569, 15570. Dec. 6.—Authorizing C.P.R. to build spurs for Taylor Lumber Co., near Kimberley, B.C., and Rock Creek Lumber Co., East Kootenay District, B.C.

15571. Dec. 6.—Authorizing C.N.Q.R. to cross Montreal St., at Pius IX. Ave., Maisonneuve, Que., and to move derail 14 ft. farther south.

15572. Dec. 7.—Ordering G.T.P.R. in addition to requirements of order of Sept. 9, to stop trains for passengers at King St., Entwistle, Alta., freight to be handled at sawmill siding, and to build highway northerly along Queens Ave. to Main St. and along Main St. to Second St. as shown on Station survey plans of Mar. 10 and Apr. 1, under penalty of $100 a day in default.

15573. Dec. 6.—Authorizing C.P.R. to build spur for Robinson & Lequime Lumber Co., Osoyoos division, Yale District, B.C.

15574, 15575. Dec. 7, 6.—Authorizing C.P.R. to cross and divert highway on its Estevan-Forward branch at mileage 4.183 and cross highway with its Swift Current branch at mileage 21.82, Sask.

15576. Dec. 6.—Approving C.N.R. plan of standard portable depot to be erected at Mountain, B.C.

15577. Dec. 6.—Authorizing C.P.R. to build bridge 108.6 on its Cascade subdivision, B.C.

15578. Dec. 9.—Recommending to Governor-in-council sanction of the lease between South Ontario Pacific Ry. Co. and C.P.R.

15579. Dec. 6.—Extending until Jan. 1, 1912, time within which G.N.R. rates be filed in accordance with order 15394, Nov. 14, re ashes for fertilizing purposes for W. H. Haight, Pipers Siding, B.C.

15580. Dec. 7.—Authorizing T.H. & B.R. to operate construction and freight trains across G.T.R. and Hamilton Radial Ry. pending installation of protection at spur to Craselli Chemical Co. authorized by order 15294, Nov. 7.

15581. Dec. 7.—Authorizing Cymri municipality to build road across C.P.R. one mile west of Halbrite, Sask.

15582. Dec. 11.—Amending order 15201, Oct. 11, to provide that M.C.R. gates at Queen St., Tilbury, Ont., be operated day and night.

15583. Dec. 9.—Amending order 15185, Oct. 20, re C.P.R. spurs by substituting Owen Sound for Sydenham tp.

15584.—Dec. 11.—Authorizing Essex Terminal Ry. to use crossing at Windsor, Ont., with M.C.R. for construction purposes only for 60 days.

15585. Dec. 5.—Extending time for completion by G.T.R. of interswitching track at Ingersoll, Ont., to June 15, 1912, cost to be divided equally between G.T.R. and C.P.R., track scales to be furnished by town of Ingersoll and installed by C.P.R. in front of Ingersoll Nut Co.'s premises.

15586. Dec. 9.—Authorizing Esquimalt and Nanaimo Ry. to open for traffic its line from Cameron Lake, mileage 107.6 to Alberni mileage 135.

15587. Nov. 27.—Dismissing T. R. Smith's application for better train service from St. Lawrence and Adirondack Ry. (N.Y.C. & H. Rd.) between Highlands and Montreal, Que.

15588. Dec. 7.—Authorizing C.N.O.R. to build bridge across highway between lots 28 and 29, con. 4, station 1768.05, Darlington tp.

15589. Dec. 12.—Approving revised location of G.T.P. Branch Lines Co. Cutknife branch, mileage 1.13 to 3.0 West Saskatoon District.

15590. Dec. 13.—Approving correction in G.T.P.R. location of Moose Jaw northeasterly branch as approved by order 14005, June 20, 1911.

15591 to 15594. Dec. 13, 12.—Authorizing C.P.R. to rebuild trestle at bridge 5.1, Brandon subdivision, Man., to use bridges at mileage 79.1, 113.5, Cascade subdivision, B.C., 15.9 and 36.6 Cranorook subdivision, B.C., and at 64.4, 131.7, 132.3 Esquimalt and Nanaimo Ry.

Passenger Rate Meetings at Detroit.

The Niagara Frontier Summer Rate Committee will hold its annual meeting at the Hotel Cadillac, Detroit, Mich. The representatives will meet on Jan. 17 and 18, at 9 a.m., and arrange details as far as possible, and their report will be submitted to the general meeting on July 19, at 11 a.m.

The Great Lakes and St. Lawrence River Rate Committee will meet at the same place on Jan. 19, immediately after the adjournment of the Niagara Frontier Summer Rate Committee's meeting.

The International Water Lines Passenger Association will meet at the same place on Jan. 18, at 4 p.m.

During Oct., 1911, 18 employes were killed and 38 were injured in the course of their work in the operation of Canadian railways, and six were killed and 11 injured in connection with railway construction. In the former case six deaths were due to being run over, four to collisions, three to being struck by trains, two to being crushed between cars, and one each to a derailment, to an explosion and to falling material; and in the latter, two deaths were due to premature explosions, two to suffocation in a cave-in, and one each to being run over, and to being struck by a train.

The Canadian Pacific Railway Terminal at Victoria Harbor.

By G. G. Ommanney, Resident Engineer, Canadian Pacific Railway.

The C.P.R.'s new Victoria Harbor terminal on the southern shore of Georgian Bay, now practically completed, is designed to be the eastern lake terminus of the new grain route of that system. This route has as its objective a reduction of mileage to the eastern distributing points, as compared with that of the present route by way of Owen Sound and Toronto. Shortening of the distance is effected both by a more direct steamship line from the western ports and by the construction of a new railway connecting Victoria Harbor with Montreal by way of Peterborough, so as to eliminate the southerly deviation to Toronto. Connection with the latter city will be maintained, however, on the Sudbury-Kleinberg branch by way of Coldwater Junction. A further considerable advantage over the old route will be gained in the greater trainloads made possible by the easier curves and gradients on the new road, which will nowhere exceed 4 deg. and 0.4 per cent. respectively.

THE SLIP AND GRAIN ELEVATOR.

The construction of the Victoria Harbor terminal embraces a slip 600 ft. wide and 25 ft. deep, flanked by parallel wharves, 3,000 ft. long on the one side and 3,600 on the other. The slip is approached by an entrance channel about half a mile long, the entire channel and slip having been formed by the removal of some 3,000,000 cu. yds. of soft material and 200,000 cu. yds. of rock by dredging. The location provides perfect shelter to vessels in all kinds of weather. This dredging has been carried out under Government supervision, the contractor, since the inception of the work in 1908, having been the Canadian Dredge and Construction Co., with whom was associated up to 1910 the Owen Sound Dredging Co. The dredging plant has consisted, during the most of the time, of three large dipper dredges, handling from 2,000 to 5,000 cu. yds. per day, with attendant hopper scows and a large rock-drilling plant. The output of this dredging plant while working in rock has been from 400 to 600 cu. yds. per day.

On the east side of the slip there has been constructed a 2,000,000 bush. grain elevator, unloading from vessels by means of two movable marine towers, each having a leg capacity on the dip of 20,000 bush. per hour. The grain can be elevated and distributed to any part of the storage house or to the working house, after weighing, whence it can be loaded into cars which are automatically fed through the track sheds by car pullers.

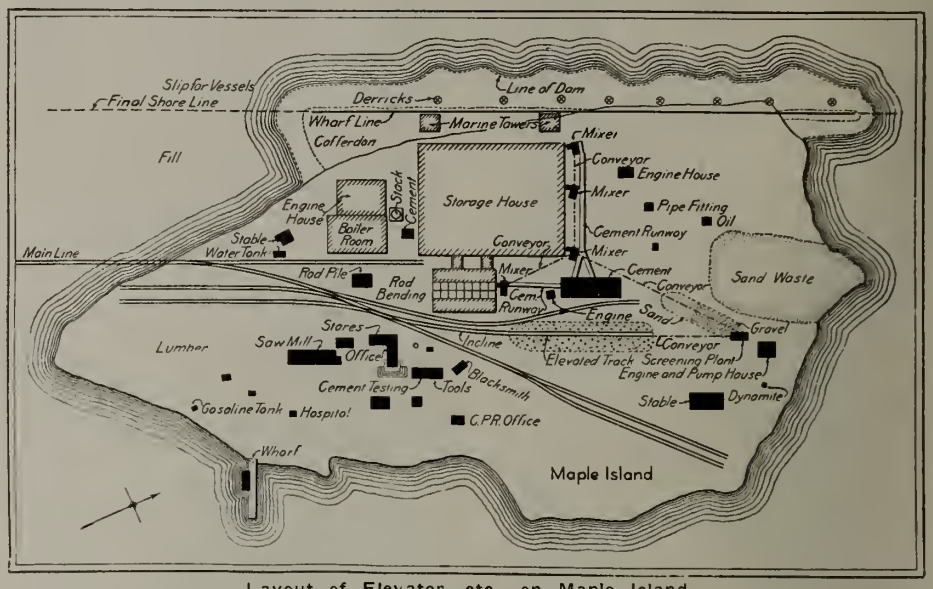
The site of the elevator was formerly an island, which had to be connected with the mainland by means of a trestle, about three-quarters of a mile long, before construction could be started. This trestle was subsequently filled from trains. Work on the elevator started in May, 1909, and the plant was handling grain in the fall of 1910.

METHOD OF BUILDING THE ELEVATOR.

About 30,000 cu. yds. of concrete were placed in the construction of this elevator and the wharf in front of it, the latter being 800 ft. long. Material for concrete was brought in by train, unloaded from centre-dump Hart cars into a belt conveyor, which carried it to a screening and washing plant. This plant was furnished with stone and sand storage bins, from which the material could be delivered to any one of four pairs of feeding bins located immediately over the concrete mixers. The mixers dumped into hoist buckets, which elevated the concrete to any required height, whence it was conveyed by buggies to the forms, the haul nowhere exceeding 200 ft., except in the case of the wharf. This method of handling the material proved remarkably successful, the only trouble encountered being due to the installation of canvas conveyor belting at the commencement of work, which proved unable to withstand the excessive wear and tear, and was replaced during the progress of the work by rubber belting.

All of the storage units of the elevator consist of concrete bins having 8 in. walls reinforced with continuous spiral ¾ in. steel rods. The joints are connected in each case by means of hooks and a link, a wedge being inserted for tightening. Forms were erected over the whole area of the bins to a height of 3 ft., and were simultaneously raised as the work proceeded, by means of screw jacks operating on threaded rods extending the full height of the bin walls. The work was thus continuous, the actual time of construction of the full height of 80 ft. of the bin walls being somewhere less than six weeks.

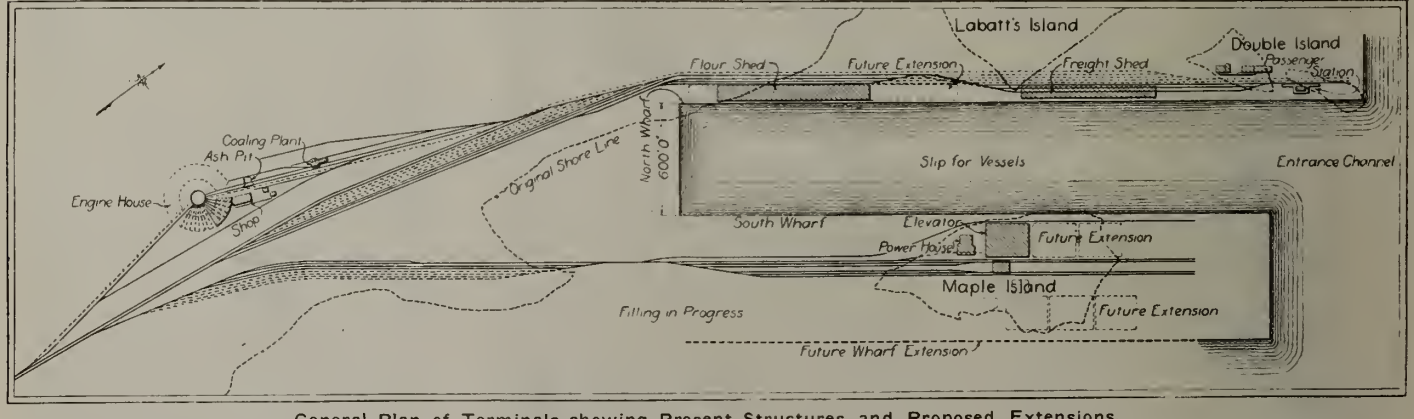
The two movable marine towers, the cupola of the working house and the remainder of the superstructure of the elevator are of structural steel.



Layout of Elevator, etc., on Maple Island.

The power installation for the elevator consists of two 500 k.w. turbo-generators, developing 3-phase, 60 cycle, 600-volt alternating current. Steam is derived from four Babcock and Wilcox water-tube boilers of 250 h.p., fitted with automatic chain grate stokers. The various conveyors and elevators are run by line shafts operated by individual motors.

The wharf in front of the elevator has a gravity section concrete wall, 800 ft. long, founded on the limestone rock. It was constructed in a trench excavated dry behind an earth cofferdam built from the material removed from the foundations. The original depth of water on the site of the dam was only 2 or 3 ft. The situation was favorable for this form of construction, and the leakage was all taken care of by two 4 in. centrifugal pumps. Foundation level of the wharf was 26 ft. below the water level.



General Plan of Terminals showing Present Structures and Proposed Extensions.

FREIGHT AND FLOUR SHEDS.

On the west side of the main terminal slip a flour shed 800 by 89 ft. wide has been erected, and a freight shed 704 by 71 ft. The flour shed is constructed of steel columns and roof girders, with continuous sliding doors on both wharf and track sides. Concrete end walls and

fire walls are provided, and the flooring is of 2 in. pine. The floor is at car-door level on the track side, and the wharf is 4 ft. above water level.

The freight shed is a timber structure having two loading tracks running through it on either side of an 11 ft. trucking platform. Continuous sliding doors open on the wharf, the level of which is 4 ft. above water level. Track doors are provided at the entrance end. A concrete fire wall is in the middle, and office accommodation in one end.

The whole of the site of these sheds was filled with sand dumped from trains after the wharf had been built, and piles were driven for the foundation, all of them being cut off below water level. The wharves at the front of the sheds were constructed of cribs, with concrete tops above water level, each crib unit being 108 ft. long 24 ft. high and 24 ft. wide at the base. The front and cross walls of the cribs were composed of 2 in. hemlock securely nailed with 4½ in. nails, the whole being built on the wooden bin principle. These walls rested on timber sills. Flotation of the lumber was overcome by means of long vertical 1⅛ in. rods connecting timbers spanning the crib walls at various levels. The crib was divided into pockets, every alternate pocket having a solid 2 in. floor to contain the filling necessary for sinking it into place.

METHODS OF PLACING WHARF CRIBS.

The operation of building cribs was continued during both winter and summer. In the summer the sills for a crib were first built on a raft, from which the crib was readily launched when the walls had reached a height inconvenient for further construction. By placing the sills on well greased pine skids on the raft, the launching could be readily effected without the use of mechanical power. Sand filling for the cribs was deposited along the shore by trains, and was wheeled out by barrows along floating runways. About 100 cu. yds. was required to insure the stability of each crib before back filling could be started.

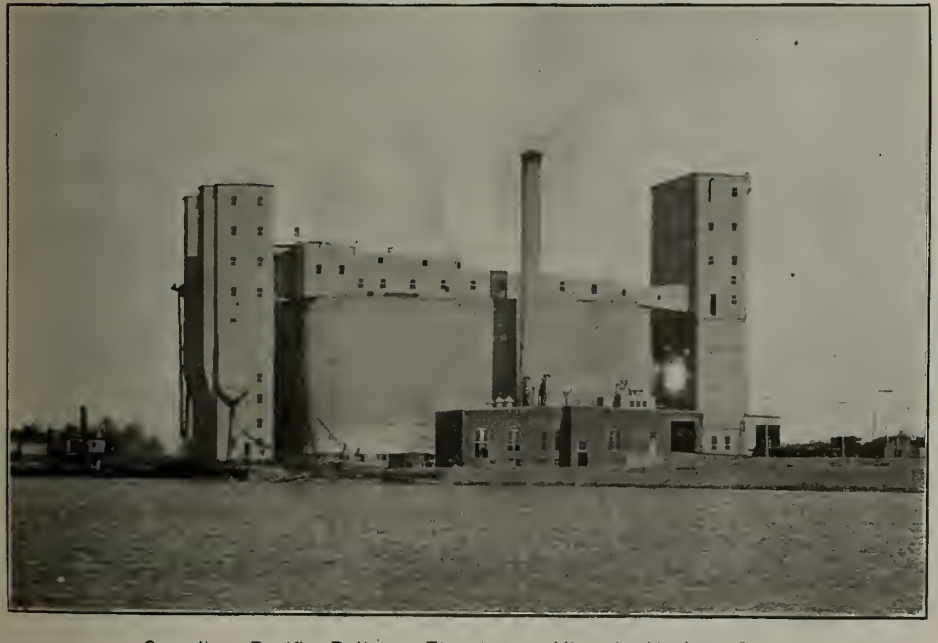
In the winter the site for a crib was first cut out of the heavy ice, which is often 27 in. thick at Victoria Harbor, and the hole then allowed to freeze thick enough to bear the weight of the sills. These were laid out on the thin ice and the building of the walls was continued.

The work of dredging on the crib sites was very carefully done, and close soundings taken before any construction was started. The time taken to build and sink one crib averaged nine days. The filling consisted entirely of sand, which was supplied by train filling after the crib had been sunk into its final position.

In addition to the principal structures mentioned, the C.P.R. is building a roundhouse, turntable, coaling plant, ice house, general offices, stores, passenger station and other buildings. All the necessary filling and grading of the large terminal yard has been done by trains.

The design of the elevator and its power plant, and details for the 1½ miles of wharves, were prepared by the John S. Metcalf Co., Ltd., Montreal, which was also the contractor for the flour and freight sheds and the wharf construction. The flour and freight sheds were designed by the C.P.R. engineering department, the building details being worked out by the contractor. The writer was resident engineer in charge of construction.—Engineering Record.

Since the foregoing was put in type the name of Victoria Harbor has been changed to Port McNicoll in honor of D. McNicoll, Vice President, C.P.R.



Canadian Pacific Railway Elevator at Victoria Harbor, Ont.

Flour Shed at Victoria Harbor, Ont.

The Railway to Hudson Bay.

A resolution was passed by the House of Commons, Dec. 4, directing a return giving all papers, correspondence and orders-in-council in connection with the awarding of the contract for the building of the railway to Hudson Bay, and of all orders suspending work on the same. The Minister of Railways said there was no change in policy in reference to the building of the line, and the Government would fulfil the promises made in respect to it when in opposition. Representations had been made to the Department that the line did not start from the right point, that the surveys were not correct, that the first hundred miles ran through a deep swamp and so on. In consequence of these representations, the Government decided not to allow the work to go on until there had been an investigation. There will be no further delay in construction than is absolutely necessary to check up the surveys.

Ottawa press reports Dec. 14 state that the Dominion Government has under consideration a proposition for the extension of the projected line westward from Pas Mission, the present starting point of the line, westerly through Melfort to Saskatoon, Sask. The Chief Engineer in charge of the work at Winnipeg, J. Armstrong, has been in Ottawa, conferring with the Minister of Railways in connection with the entire project.

Further reports from Ottawa state that the result of the hydrographic survey of the waters of Hudson Bay, made by the steamer Stanley, are now under consideration, and it is reported that the survey shows that vessels of special construction will be necessary to navigate the bay, owing to the prevalence of ice, and that Fort Churchill will provide a better harbor than Port Nelson, notwithstanding the fact that the entrance is narrow. The water is very shallow at Port Nelson, in fact only 24 ft. was found, with the shore out of sight. (Dec., 1911, pg. 1129.)

Oil Burning Locomotives for the C.P.R.

As stated in previous issues, crude oil is to be used for fuel for C.P.R. locomotives between Field and Kamloops, B.C., and tanks of 200,000 galls. capacity are to be built at seven places in that territory. We are now officially advised that 76 locomotives are to be converted to oil burners as follows:—

41 class N-3, cylinders 23½ by 32 ins., driving wheels 63 in. diameter.

16 class D-9, cylinders 21 by 30 ins., driving wheels 63 ins. diameter.

6 class R-1 Mallet compounds, cylinders 23 and 32 by 26 ins., driving wheels 58 ins. diameter.

13 small locomotives of various classes.

The mechanical department is getting information as to the types of oil burners in use on other lines before deciding on what type will be adopted. The oil burning equipment and oil tanks will probably be built at the Angus shops, Montreal, and shipped to the west for application to the locomotives.

It is not contemplated at present to build any new locomotives specially for burning oil, but it is possible that five now under construction by the Montreal Locomotive Works may be changed over for oil burning.

The Halifax and South Western Ry. has been ordered to pay $1,950 damages for loss of a house and barn by fire, due to sparks from a locomotive setting fire to dried grass, etc., along its right of way.

The Quebec branch of the Canadian Society of Civil Engineers at its annual meeting, Dec. 6, elected W. D. Baillairge Chairman, and A. Amos, Secretary for the current year. Various questions affecting navigable rivers were discussed, and the meeting concluded with a social entertainment.

Grand Trunk Railway Construction, Betterments, Etc.

New England Plans.—The Providence, R.I., city council has passed an ordinance granting the Southern New England Ry. the right to lay tracks along the west side of Providence River.

Application is being made by E. H. Fitznugh to the Vermont Legislature for a charter to build a railway from Barre to Williamstown, under the title of the Barre Granite Ry. The matter will come before the Public Service Commission Jan. 8. It is proposed that the new railway connect with the Montpelier and Wells River Rd. It is said Barre will be made the headquarters of the new road if the project materializes.

The question of the union railway station at Burlington, Vt., came before the Public Service Commission Dec. 5, but its decision has not been announced.

General Betterments. — During the past year the G.T.R. is reported to have completed the following betterments: overhead bridges at Brighton, Oshawa, Scarboro, Groveton, Grimsby, Mallorytown and Palmerston, Ont.; subways, East Brighton, Vt., Pownal and Cobourg, Ont.; new stations at Cobourg, Guelph, Sarnia Junction, Brule Lake, Thorndale, Wyebridge, Hepworth, Maxville, Dublin, Ont., and Beloeil, Chaudiere Jct., and Beauharnois, Que.; new freight sheds at Cobourg, Paris, Junction, Glencoe and Bowmanville, Ont., and West Detroit, Mich., also a fruit shed at Detroit, Mich. large locomotive house at Tiffin, Ont. Coal chutes at Ottawa, Ont., and Elsdon, Ill. Y.M.C.A. buildings at Port Huron, Mich., and Elsdon, Ill.

Richelieu River Bridge.—The G.T.R. is renewing the bridge across the Richelieu River, near Lacolle, Que., formerly part of the Canada Atlantic Ry. The existing draw span is a steel structure 186 ft. over all, and is to be replaced by a new steel swing 250 ft. over all, having a capacity of E-50, loading. The new bridge will afford two channels of 97 ft. each, in the clear. The present pivot pier is octagonal in shape, and is of concrete on a grilled flooring resting upon piles. This pier is to be replaced by a new one, square in shape, and enlarged to meet the new conditions. The pier will be built solid from the river bed up. The rest piers at present are of concrete, supported on piles, but they are to be taken down and replaced by new concrete piers enlarged to meet the special circumstances. The present approaches to the draw on either side are composed of pile bents for an aggregate length of 850 ft. This pile work is to be replaced by 12 deck plate girders resting on new concrete piers, which will be placed 60 ft. apart, centre to centre. The rail level at the bridge is to be raised 3½ ft. to accommodate the new superstructure. The John S. Metcalf Co., Ltd., Montreal, has the contract for the substructure, at a cost of about $140,000. The superstructure is to be built and erected by the Dominion Bridge Co. This work is under the supervision of H. R. Safford, Chief Engineer of the G.T.R. system.

Winter Warehouse at Montreal.—The G.T.R., which has rented the Donaldson shed at the wharf for the winter, is reported to have laid a track along the revetment wall, to facilitate the handling of freight thereto.

Humber Bridge.—One of the abutments of the newly built bridge over the Humber River, a part of the Toronto Lake Shore improvement showed signs of settlement after having been completed, and traffic was suspended. The abutment was temporarily reinforced, and traffic was resumed Nov. 23, on the northern tracks. There has been no further sign of settling, and the engineers believe that a solid bottom has been found by all parts of the abutment. The total settlement was about four inches.

Hamilton.—The Board of Railway Commissioners has authorized the company to expropriate certain lands in Hamilton, Ont., on the east side of Elgin St., and north of Robert St.

Guelph Subways, etc.—The Board of Railway Commissioners has directed the company to build a subway for foot passengers at Wilson and Norfolk streets, Guelph, Ont., the cost to be paid by the city.

Stratford Station and Yards.—The Stratford, Ont., city council has under consideration plans showing the location and the details of the proposed new station, and rearrangement of the yards. The city is asked to approve the plans before they are submitted to the Board of Railway Commissioners. The foundations of the new station building have been laid.

London Improvements.—A manufacturing firm in London, Ont., is reported to have been notified by the G.T.R. that the site of its factory may be required for the projected improvements in that city, and that its lease, which expires within two years, cannot be renewed. Other firms occupying G.T.R. property are reported to have received similar intimations.

Bay City, Mich.—U.S. press reports state that the company has secured the last of the property needed at Bay City, Mich., for its proposed terminal station and yards. The new work, it is stated, will cost about $1.000.000.

A Record Run on the Michigan Central Railroad.

W. C. Brown, President, and other officials travelled on a special train from Suspension Bridge, N.Y., to Windsor, Ont., on Nov. 9, making what is believed to be a record run. We were unable to obtain the official record in time for our last issue, but it is not too late to be of great interest now.

The train, which consisted of three modern official cars and one modern combination coach and baggage car, left Suspension Bridge at 8.49 a.m., arrived at Montrose at 9.02 a.m., where engines were changed and one of the large Pacifics put on, left Montrose 9.05 a.m., arrived at Welland at 9.18 a.m., left there at 9.23 a.m., delayed five minutes on account of a boat passing through Welland drawbridge, arrived at St. Thomas at 10.49 a.m. without stop, left St. Thomas 10.51½ a.m., arrived at Windsor at 12.23½ p.m. without making a stop. The distance from Welland to St. Thomas is 100 9-10 miles and the run was made in 86 minutes. The distance from St. Thomas to Windsor station is 109 62-100 miles and this distance was covered in 92 minutes.

In regard to the foregoing an officer writes us:—"Considering the size of the train, I think this is the fastest run that has ever been made between Welland and Windsor and that it will be found equal to, if not better than, long distance fast runs on other railways for similar distances, in view of the fact that it was necessary to change engines at St. Thomas."

Press reports in England, which state that the Dominion Ex. Co. is now operating over the Canadian Northern line, are apt to be somewhat misleading. The facts are, that the Canadian Northern Ex. Co. is not at present soliciting business in Great Britain, and that the Canadian Northern Ex. Co. and the Dominion Ex. Co., are operating jointly on the Royal Line, owned by the Canadian Northern Steamships, Ltd.

Canadian Northern Railway Earnings, Expenses, Etc.

Gross earnings, working expenses, net profits, increase or decreases, compared with those for 1910-11, from July 1, 1911 :—

	Earnings.	Expenses.	Net Earnings.	Net Increase
July	$1,475,900	$1,114,300	$361,600	$13,400
Aug.	1,420,600	1,105,900	314,700	51,700
Sept.	1,576,400	1,157,000	419,400	38,200
Oct.	2,028,900	1,348,500	680,400	99,900
	$5,501,800	$4,725,700	$1,776,100	$203,200
Inc.	1,276,000	1,072,800	203,200	....

Approximate earnings for November, $2,001,500, and for two weeks ended December 14, 1911, $885,400, against $1,565,400 and $621,100 for same periods 1910.

The mileage operated during October 1911, was 3,731 against 3,304 during October 1910.

Canadian Pacific Railway Earnings, Expenses, Etc.

Gross earnings, working expenses, net profits, increases or decreases, compared with those for 1910-11, from July 1, 1911 :

	Earnings.	Expenses.	Net. Profits.	Net Increase
July	$ 9,661,815.14	$5,958,789.81	$3,703,028.33	$218,408.74
Aug.	10,421,904.42	6,346,333.41	4,075,571.01	388,898 68
Sept.	10.049,084.97	6,131,638.17	3,917,446.80	5,847.16
Oct.	11,207,991.99	6,526,887.24	4,631,104.75	175,944.23
	$41,340,799.52	$24,963,648.63	$16,377,150.89	$784,098.81
Inc.	3,671,669.09	2,857,570.28	784,098.81	.....

Approximate earnings for November, $9,202,000, and for two weeks ended December 14, $3,000,000, agains $8,543,000 and $3,000,000 for same periods 1910.

The mileage operated was increased during November to 10,809.

Grand Trunk Railway Earnings, Expenses, Etc.

The following figures show the earnings and expenses of the G.T.R., C.A.R., G.T. Western Ry. and D.G.H. & M.R., for Oct., as compared with those for Oct., 1910:—

GRAND TRUNK RAILWAY.

	1911.	1910.
Gross earnings	$3,455,265	$3,251,700
Expenses	2.542.870	2 331,300
Net earnings	$ 912,395	$ 920,400

CANADA ATLANTIC RAILWAY.

	1911.	1910.
Gross earnings	$ 206,488	$ 203,800
Expenses	177,268	157,800
Net earnings	$ 29,220	$ 46,000

GRAND TRUNK WESTERN RAILWAY.

	1911.	1910.
Gross earnings	$ 581,478	$ 542,500
Expenses	444,631	464,300
Net earnings	$ 136,847	$ 78,200

DETROIT GRAND HAVEN AND MILWAUKEE RY.

	1911.	1910.
Gross earnings	$ 228,403	$ 201,900
Expenses	168,989	150,300
Net earnings	$ 59,414	$ 51,600

Approximate earnings for Nov., $4,101,244, and for two weeks ended Dec. 14, $1,822,778, against $3,845 640 and $1,664.288 for same periods 1910.

TRAFFIC RECEIPTS OF THE SYSTEM.

Aggregate from July 1 to Nov. 30, 1911:—

	1911.	1910.
Grand Trunk Ry.	£3,482,803	£3,095,556
Canada Atlantic Ry.	194,324	173,608
Grand Trunk Western Ry.	575,197	501,754
Detroit, Grand Haven and Milwaukee Ry.	210,634	178,103
Totals	£4.462,958	£3 949,021

The Windsor, Ont., court of revision has confirmed an assessment of $2,500,000 upon the section of the Detroit Tunnel owned by the Michigan Central Rd., situated in Canada.

Running Rights on the T. and N.O. Ry.—Application is being made to the Dominion Parliament to confirm an agreement made Dec. 1, 1911, between the G.T.R. and the Temiskaming and Northern Ontario Ry. Commission providing for the joint use of the T. and N.O.R. between North Bay and Cochrane, Ont., and authorizing the G.T.R. to operate its trains over the T. and N.O.R. from near Nipissing Jct. to North Bay.

RAILWAY DEVELOPMENT.

Projected Lines, Surveys, Construction, Betterments, Etc.

Alberta Central Ry.—The Board of Railway Commissioners has authorized the building of a bridge over the Red Deer River at mileage 5.93, and across the North Saskatchewan River at Rocky Mountain House, mileage 61.5. It has also approved location plans for the line from mileage 194.6 to 220 from Red Deer. (Dec., 1911, pg. 1137.)

Alberta Pacific Ry.—The Alberta Legislature is being asked to extend the time for the building of the line authorized by chap. 48 of the statutes of the second session of 1910. Boyle, Parlee and Co., Edmonton, Alta., are solicitors for applicants. (Sept., 1911, pg. 853.) 1911, pg. 853.)

Algoma Central and Hudson Bay Ry.—The Minister of Railways has approved a revision of the route map of the extension from mileage 83.80 to the junction with the National Transcontinental Ry.

Algoma Eastern Ry.—Application is being made to the Dominion Parliament for an extension of time within which the line from Meaford to Owen Sound may be built, and also for the building of various branch lines connecting the line from Sudbury to Little Current (completed or under construction) with Owen Sound, to Lake Timagami, to Lake Superior between Michipicoten Harbor and Batchawana Bay; from Bowell tp. to McLennan tp.; to the C.P.R. near Onaping or Cartier stations, and from Drury or Hyman tp. to Sudbury.

The Board of Railway Commissioners has approved revised location plan for a portion of this line, and, subject to the approval of the Ontario Government, the diversion of the trunk road at mileage 34.75.

During 1911 the company laid track as follows:—Espanola village northerly to Spanish River, 4.60 miles, and from Espanola village southerly to mileage 50.50 from Sudbury 1.50 miles. It has under contract an extension from Crean Hill to Little Current, on Manitoulin Island, 61.77 miles. This is covered by two contracts, both of which are held by the Superior Contracting Co., Espanola, Ont. The work on the mainland is reported to be pretty well finished, with the exception of a rock cut north of Whitefish. The grading is completed to Goat Island, across which the line is being located. Soundings are being made of the channel between Goat Island and Little Current in order to determine the exact location of the bridge. Bridge work is being proceeded with at the crossing of the Spanish River, and at the crossing of the C.P.R. at Nairn Centre. (Oct., 1911, pg. 935.)

Athabasca Valley Ry.—Application is being made to the Alberta Legislature to incorporate a company with this title to build a line from near Independence, on the Edmonton, Dunvegan and British Columbia Ry.'s projected line, or from near Edmonton, northwesterly to Fort Assiniboine, on the Athabasca River. C. A. Grant, Edmonton, Alta., is solicitor for applicants.

Press reports from Edmonton state the J. D. McArthur interests, which recently acquired the Edmonton, Dunvegan and British Columbia Ry. charter, are behind this project, and that the provisional directors will include J. D. McArthur, J. K. McLellan, R. A. Hazleton, D. W. Campbell, and W. P. McDougall, all of Winnipeg. (See also Edmonton, Dunvegan and British Columbia Ry.)

Atlantic Quebec and Western Ry.—We are advised that tracklaying has been completed, and that its total mileage from New Carlisle to Gaspe, Que., is 102.5. During 1911 track was laid from Barachois to Douglastown, 20.5 miles, thus connecting up work previously done. (Dec., 1911, pg. 1137.)

British Columbia and Alaska Ry.—The British Columbia Legislature is being asked to amend sec. 3, chap. 56, of the statutes of 1910, by changing the location of one of the lines authorized. This is to be accomplished by striking out all the words after Columbia in line 10, and substituting the proposed new location: from Fort George northeasterly via Fort McLeod to the Parsnip River, thence to Peace River, to Finlay River, through Sifton Pass, and down the Stikine River to Telegraph Creek; with branch lines through the Pine or Peace River passes to the eastern boundary of British Columbia; or in the alternative by way of Lytton and Teslin Lake; and a line from some point on the main line to Vancouver. An extension of line for the building of the previously authorized lines is also asked. Robertson and Heisterman, Victoria, are the solicitors. (Nov., 1911, pg. 1035. See British Columbia and Dawson Ry. and B.C. Ry. and Development Co., Sept., 1911, pg. 858.)

British Columbia and Dawson Ry.—The Dominion Parliament is being asked to authorize the company to build branch lines following the same routes as those which the B.C. and Alaska Ry. is applying to the B.C. Legislature for authority to build. The only additional information contained in the B.C. and D. Ry. application is that the starting point of the line to Vancouver will be between Ashcroft and the entrance of Big Creek into the Fraser River. (July, 1911, pg. 645. See British Columbia and Alaska Ry. and B.C. Ry. and Development Co., Sept., 1911, pg. 858.)

Burrard Inlet Tunnel and Bridge Co.—E. Cruttwell, the British engineer representing Sir J. W. Barry, Consulting Engineer for the municipalities interested in the building of this bridge, left Vancouver, B.C., for Ottawa, recently, to consult with the Department of Railways on the plans. The principal question involved is that of the draw span, which it is thought will be one of 250 ft. in order to provide adequate accommodation for vessels. The completed plans are expected early in the New Year

The report of E. Cruttwell, the English consulting engineer, was laid before the directors, Dec. 11, and a resolution adopting the plan providing for a bridge accommodating a single track steam railway, a double track electric railway, with roadway and sidewalks, was passed. The plan also showed the approaches with a double track steam railway. The estimated cost of the structure was put at $2,125,000. The directors were told that after a consultation with the engineers of the Department of Railways at Ottawa, Mr. Cruttwell was informed that the Government would consent to the opening span being reduced to 200 ft. wide. Copies of the report are being sent to the municipalities interested, with a request that they consider the desirability of providing increased subsidies to meet the extra cost of the bridge—the original estimate having been $1,250,000. On Dec. 14 the directors waited on the Provincial Government, and the Premier promised favorable consideration to the request for increased assistance, but advised the company to make sure that the plan adopted would provide amply for the future. The Dominion Government will also be asked for an increased subsidy, the one at present available being in favor of the Vancouver, Westminster and Yukon Ry. Co., which is associated with the B.I.T. and B. Co. (Dec., 1911, pg. 1137.)

Cumberland Ry. and Coal Co.—A. Dick, General Sales Agent of the Dominion Coal Co., which now owns the C.R. and C. Co., is reported to have stated, Dec. 4, that if the Dominion Government will extend the Intercolonial Ry. to the waterfront at Wallace, N.S., about three miles, the company will expend about $250,000 in establishing wharves, etc., there. This would enable the company to have direct access to the St. Lawrence River as its own railway runs from Springhill on the I.R.C. to the Bay of Fundy. The people of Wallace are reported to have offered to provide a right-of-way for the branch line.

Delaware and Hudson Co.—The Board of Railway Commissioners has ordered the Napierville Jct. Ry., one of the company's lines in Canada, to build a station at Delson Jct., Que., at once, with leave to occupy lands belonging to the G.T.R. and the C.P.R., which may be necessary. (Oct., 1911, pg. 935.)

Dominion Atlantic Ry.—We are advised that it is not likely the construction of the projected North Mountain Branch will be started until sometime late this year or until 1913. The proposed branch will start at Centreville, on the Cornwallis Valley branch, and will run westerly to Weston, N.S., between 14 and 15 miles. The location plans of the first five miles from Centreville to Lakeville have been approved by the Board of Railway Commissioners, and the remaining mileage is under survey. (Dec., 1911, pg. 1137.)

Edmonton, Dunvegan and British Columbia Ry.—The Minister of Railways has approved the route map of this projected railway from Edmonton to Dunvegan, Alta., via Lesser Slave Lake. The route for the entrance into Edmonton has not yet been presented for approval. (See Edmonton to Peace River, Oct., 1911, pg. 925; see also Athabasca Valley River.)

A press report states that a contract has been let to G. H. Webster for grading on this projected line from Edmonton, towards Dunvegan, and the Peace River country. It is further reported that the location surveys for the first 40 miles northwesterly from Edmonton have been completed.

Halifax and Eastern Ry.—Negotiations are reported to be in progress for the purchase by the Dominion Government of about a quarter of a mile of water frontage from the Intercolonial Ry. at Dartmouth, N.S., to the ferry, for terminal purposes for the H. and E.R. The price of the properties included in the area is said to be about $100,000. The construction of the H. and E.R. was authorized by the Dominion Parliament, and contracts were let by the late Government for building it. (See Intercolonial Ry., Nov., 1911, pg. 1035.)

High River, Saskatchewan, and Hudson Bay Ry.—The municipal council of High River, Sask., passed a resolution Dec. 7, asking the Provincial Government to guarantee the company's bonds for $13,000 a mile. (Nov., 1911, pg. 1035.)

Intercolonial Ry.—Press reports recently stated that a new branch line had been opened for traffic from Ferrona Jct. to Sunny Brae, N.S. We are officially advised that no new branch line has been opened, but that the Dominion Government has bought and is operating its trains over the line between Ferrona Jct. and Sunny Brae, which was formerly owned and operated by the Nova Scotia Steel and Coal Co.

A very full description of the new deep water terminal at Halifax, with plans, etc., will be found in the Marine Department on later pages of this issue.

Replying to questions in the House of Commons, Nov. 29, the Minister of Railways said the contract for the building of the new branch of the I.R.C. from Sunny Brae to Guysboro and from Guysboro and County Harbor to Melrose, had been awarded by order-in-

council dated Oct. 2 to the Nova Scotia Construction Co. The estimated cost of construction on schedule prices was $1,057,122.19. The contract for the building of the branch from Dartmouth to Deans Settlement, to connect with the first mentioned line, was awarded by order-in-council dated Oct. 2 to M. P. and J. T. Davis, Ottawa, the estimated cost of construction on schedule prices being $1,940,277.98. The contract for this branch had not been signed. On Nov. 30 the Minister stated that the question of going on with the construction of the Guysboro branch was under consideration. For the proposed spur line at Hampton, N.B., only one tender was received, and this had not been dealt with. It was not the Government's intention to proceed with the building of this spur at present. Offers had been received for the building of the branch line from Estende to Baddeck, in Cape Breton, but no contract has been let, and the Minister of Railways informed the House of Commons, Nov. 30, that it was not intended to proceed with the building of the line at present.

The Minister of Railways informed the House of Commons, Dec. 7, that P. S. Archibald, M. Can. Soc. C.E., Chief Engineer of the I.R.C. up to 1896, had been engaged by the department to report on the proposed branch lines above referred to.

Tenders were received to Dec. 26 for the building of a brick freight shed at Truro, N.S. (Dec., 1911, pg. 1137.)

Essex Terminal Ry.—The Board of Railway Commissioners has authorized the company to use for construction purposes only for 60 days from Dec. 11, 1911, its crossing of the Michigan Central Rd. at Windsor, Ont. (Dec., 1911, pg. 1137.)

Joliette and Lake Manuan Colonization Ry.—The British Canadian Construction Co., which is reported to have entered into a contract for the building of this railway from Joliette to Lake Manuan, Que., has its head office at Ottawa. We have ascertained that construction is in progress about 12 miles out from Joliette, —O'Reilly, of Ottawa, representing the contractors, and that — Sims, St. Felix de Valais, Que., is also on the work. Some time ago the engineer in charge of surveys, etc., was J. N. Paton, who came from England to take charge. (Dec., 1911, pg. 1139.)

Kaslo and Slocan Ry.—We are advised that a portion of this line, formerly owned by the Great Northern Ry. (U.S.A.) has been operated since Sept. 15 by its new owners, under the original title. The mileage operated extends from Kaslo to Sproule, B.C., 15 miles. Beyond Sproule a fire destroyed the bridges and did considerable damage to the track. The company has not yet decided as to the restoration of the destroyed mileage. (Nov., 1911, pg. 1035.)

Kettle Valley Lines.—Application is being made to the Dominion Parliament to authorize the building of a branch from Vernon, southerly and southeasterly to Penticton, B.C., and to extend the time within which the company may build lines previously authorized.

Press reports state that surveys are being made along Five Mile Creek in the Similkameen Valley for an alternative route. From the mouth of Five Mile Creek, the survey will extend along the Similkameen River to East Princeton Princeton, Coalmount, then through the Otter Valley to the head of the Coldwater River, to which point steel has been laid from Merritt

During 1911 the company laid track on the following sections under construction from Midway to the Fraser River, B.C.; from Midway to Westbridge, 25 miles, and from Merritt to Coldwater Summit, 30 miles. The line between Westbridge and Coldwater Summitt is being built by L. M. Rice and Co., whose construction headquarters are at Penticton, B.C.

The Spokane and British Columbia Ry., which is the title of a charter held by the company in the U.S., has under survey a line from Republic, the present southerly terminus of the line, to Spokane, Wash., 140 miles. (Dec., 1911, pg. 1139.)

Knee Hill Ry.—Application is being made to the Aberta Legislature for an extension of time for the building of the railway authorized by chap. 27 of the statutes of 1907; making certain changes in the provisional directors, authorizing an extension easterly to the Red Deer River, near the mouth of Knee Hill Creek, Three Hills Creek or Rosebud Creek, and to Calgary; and authorizing the company to enter into agreements with any other railway to be constructed to or across the Red Deer River. It is also proposed to change the name to the Calgary, Carbon and Red Deer Ry. Co. Duncan, Stuart and Warner, Calgary, are the solicitors. (See Calgary and Knee Hill Ry., Aug., 1909, pg. 573.)

Ladysmith Lumber Co.—We are advised that the logging railway which is being used by the Vancouver-Nanaimo Coal Mines Co., is the one built by the Ladysmith Lumber Co., under the charter of which company any extensions will be built.

The L.L. Co. was incorporated by the British Columbia Legislature in 1908, with power to build and operate for twelve years a line from 500 miles north of the Comox wagon road on the Esquimalt and Nanaimo Ry. to the old East Wellington right of way and northwesterly for two miles beyond the Government gazetted waggon road in the Mountain district, with branch lines. (See Vancouver and Nanaimo Coal Mines Co., Dec., 1911, pg. 1141.)

London and Port Stanley Ry.—It is said that the Lake Erie Coal Co. has under consideration plans for submission to the London, Ont., city council, which owns the L. and P.S. Ry., for electrifying the line. The proposition is that the company shall electrify the line, receiving in return the right of running freight trains, the city operating passenger cars. The city would also have the right of granting running rights over the line to other companies. It is said that the proposition will come up for discussion at the annual meeting. (Dec., 1911, pg. 1139.)

Lotbiniere and Megantic Ry.—See Quebec Eastern Ry.

Michigan Central Rd.—The cantilever bridge across the Niagara River, which is owned by the Niagara River Bridge Co., a subsidiary of the M.C.R., was opened in 1883, and is 910 ft. long, with a span of 47.0 ft. between the towers, and is 200 ft. above the level of the river. It is used exclusively for railway traffic. For some months past considerable work has been done in the way of building piers, etc., at the approaches on both sides of the river, and press reports state that all this has been done in preparation for the building of a new bridge. The same reports further state that the plans for the superstructure have been prepared, and that it is expected work will be started upon it during the current year or early in 1913. On July 3, 1911, we were officially advised that press reports to the effect that the company contemplated replacing the bridge were incorrect, as it was in good condition. (Dec., 1911, pg. 1139.)

An officer at Detroit, Mich., wrote us Dec. 20:—"We know nothing regarding the building of a new bridge at Niagara Falls, or the replacing of the present bridge. We have under construction, however, the replacing of approaches, with new bridges across streets, with cement walls and embankment between streets."

Minneapolis and St. Louis Rd.—Iowa Central Ry.—An issue of $10,000,000 of additional stock by these merged companies has been authorized by the State of Iowa. An official is quoted as stating that the line will be extended north from Minneapolis to Winnipeg, and south from Centerville, Iowa, to a connection with the Missouri, Kansas and Texas Ry. W. G. Bierd, Vice President, is quoted as stating that the I. C. Ry. would be taken over by the M. and St. L. Rd. at the next meeting of the directors; that the financing for the amalgamated companies had been arranged, but the routes of the projected extensions had not yet been determined, that the company had made its investigations of the territory through which the lines would go, but their ideas had not yet been worked out. (Dec., 1911, pg. 1139.)

Minneapolis, St. Paul and Sault Ste. Marie Ry.—Track was laid during 1911 from Frederic to Boylston Jct., Wis., 73.1 miles, and nine miles south of Superior, Wis.

The plans for the proposed terminal in Chicago, Ill., to be built by the Central Terminal Co., and leased to the M., St. P. and S.S.M. Ry., are under consideration by the city authorities, as some questions concerning streets are involved.

The North Arm Bridge and Ry. Co. is asking the Dominion Parliament for authority to build a railway and general traffic bridge across the north arm of Burrard Inlet, from Turtle's Head to lot 575 north of White Rock Island, with a line of 10 miles to connect with the C.P.R. and existing and projected lines entering Vancouver, as well as a line on the north shore of the inlet to Vancouver, or to connect with any railway built or to be built on the north shore. The provisional directors are:—E. C. Cartwright, A. G. Langley, P. M. Smith, Vancouver; W. H. Langley, Victoria, B.C.

Residents of North Vancouver, B.C., passed a resolution, Nov. 25, asking the public authorities interested to oppose the application to the Dominion Parliament for power to build 10 miles of railway and a bridge across the north arm of Burrard Inlet, so as to connect the C.P.R. and other railways with North Vancouver. W. H. Langley, representing the promoters, said the project was in no way connected with the C.P.R., but several landowners along the route suggested for the line, stated that they had been informed the C.P.R. was at the back of the project. (Dec., 1911, pg. 1139.)

North Eastern Ry.—Application is being made to the Quebec Legislature to change the name to the North Ry. Co. and to give power to build the following lines in addition to those authorized by chap. 24 of the statutes of 1907; a branch to connect Ville Marie with the C.P.R. at Rapide de l'Orignal; one or more branches from near Lake Timiskaming to Lake Metagami, thence following the Nottaway River as far as Rupert's Bay or James Bay; a railway from Montreal to a junction with the National Transcontinental Ry., and thence to James Bay. L. A. Cannon, Quebec, is solicitor for applicants.

Montreal press reports state that M. J. O'Brien is interested in the building of this line, and that all the arrangements for starting construction early in the new year have been completed. (Sept., 1909, pg. 651.)

Northern Territorial Ry.—The Dominion Parliament is being asked to incorporate a company with this title to build a railway from Fort Churchill, on Hudson Bay, westerly to Lake Woolaston, Sask., to the south shore of Lake Athabasca, Alta., north of the Peace River Block, through the Rocky Mountains, to the Pacific coast at Port Essington or the Portland Canal, with a branch from near the crossing of the Athabasca River via Fort McMurray

and Lac la Biche to Edmonton, Alta. Bishop, Pratt and Delavault, Edmonton, Alta., are solicitors for applicants.

Nova Scotia Steel and Coal Co.'s Ry.—We are officially advised that the company has sold its railway extending from Ferrona Jct. to Sunny Brae, U.S., to the Dominion Government for $100,000, and that the line is now being operated as a branch of the Intercolonial Ry. (See Intercolonial Ry.)

Ottawa, Brockville and St. Lawrence Ry.—Application is being made for an extension of time for the building of the line authorized by chap. 71 of the Dominion statutes of 1900. N. Belanger, Ottawa, is Secretary of the company. (May, 1910, pg. 353.)

Pacific and Atlantic Ry.—The Dominion Parliament is being asked to extend the time within which the company may build the lines referred to in sec. 1, chap. 138, of the statutes of 1906. T. Gibson, Toronto, is solicitor for applicants. (April, 1910, pg. 271.)

Pacific and Peace River Ry.—The Minister of Railways has approved the route map of this projected railway from Bella Coola or Dean's Channel, B.C., to Dunvegan, Alta. (Mar., 1911, pg. 207.)

The route map approved by the Minister of Railways is for a line from about 60 miles east of Kamsquot Bay on the Pacific Coast, to Dunvegan, Alta.

Portland Canal, B.C.—Pacific coast press reports state that the Guggenheim interests have acquired a controlling interest in a large number of mines in the Portland Canal district of British Columbia, and that plans for their development, including the building of a railway, are under consideration.

Prince Edward Island Ry.—The Minister of Railways stated in the House of Commons, Dec. 4, that a contract had been let to T. Campbell, Charlottetown, P.E.I., for building a branch line from O'Leary's station to West Point, at an approximate cost on schedule price of $72,706. The Government directed the stoppage of work in order that the Minister might enquire into the matter. (Oct., 1911, pg. 937.)

Quebec and Saguenay Ry.—It is reported that about 43% of the grading on the line under construction from St. Joachim to Murray Bay, Que., has been completed, and that it was expected that the line will be ready for operating by Sept. The directors are said to have under consideration plans for the extension of the line from Murray Bay to the Saguenay River. (Dec., 1911, pg. 1139.)

During 1911 track was laid on 7.5 miles, from mileage 56.5 to 64. We are advised that 34 miles of grading has been completed from St. Joachim to mileage 56.5, and that it is ready for track laying. Surveys are being made for an extension from mileage 64 to the outlet of Lake St. John at Grand Discharge, 80 miles. A. H. N. Bruce is Chief Engineer.

Quebec Central Ry.—The Quebec Public Utilities Commission has approved plans for the building of a 126 ft. deck lattice girder span, over the St. Francis River at Sherbrooke, Que. The contract for the superstructure has been let to the Dominion Bridge Co., Montreal. (Dec., 1911, pg. 1139.

Quebec Eastern Ry.—Application is being made to the Quebec Legislature to authorize the company to absorb the Lotbiniere and Megantic Ry. Co., to increase the capital stock by adding the amount of the outstanding capital of the L. and M.R. Co., and to renew and validate all the powers conferred upon the Q.E.R. Co. and the L. and M.R. Co., to grant the company additional powers in regard to the issue of bonds or debentures; to declare that the company shall not be subject to article 6645 of the Revised Statutes of Quebec, but that it shall have an extension of time for the building of its lines; and to provide that upon the amalgamation of the two companies the L. and M.R. Co. shall cease as a separate corporation. (Dec., 1911, pg. 1139.)

St. Charles and Huron Ry.—The Quebec Legislature is being asked to incorporate a company with this title, to build a railway from St. Ambroise de la Jeune-Lorette, on the Quebec and Lake St. John Ry., northerly for about eight miles to the Huron River in the parish of St. Edmond de Stoneham, Que. L. A. Cannon, Quebec, is solicitor for applicants.

St. John Valley Ry.—Some matters in connection with the final agreement with the Dominion Government for the building of this projected railway from St. John, along the river valley, were considered by the New Brunswick Government, Nov. 30. It was stated that the Dominion Government has decided to build certain bridges, which are estimated to cost $1,250,000. The Premier of New Brunswick is quoted as saying that construction will be started in the spring. (Dec., 1911, pg. 1141.)

St. John Valley Ry.—Press dispatches from Fredericton, N.B., Dec. 12, state that the contract for the building of this projected railway was signed that day. The contract has been entered into between the Provincial Government and the St. John and Quebec Ry. Co., being signed on behalf of that company by A. R. Gould, of Presquil, Que., President, and J. V. Thomas, Secretary, with F. J. Lasman, New York, representing the financial interests associated with the company. The contract calls for the construction of a first class trunk line from Grand Falls to St. John, 208 miles, which is to be completed by Nov. 1, 1915, the section from Fredericton to Gagetown and from Fredericton to Centreville by Nov. 1, 1913. When completed the line is to be operated by the Intercolonial Ry., the S.J. and Q.R. Co. receiving 40% of the gross earnings. The province guarantees the bonds for the line up to $25,000 a mile, while the Dominion Government also provides a subsidy upon the usual terms, and will build certain of the heaviest bridges.

In connection with this line, the end of the company located in the United States has a charter authorizing the purchase of a section of the C.P.R. in the vicinity of Aroostook Jct., and the building of a line to connect with the St. John Valley Ry. A. R. Gould is also President of this company, and R. Thompson, its Chief Engineer, has been in St. John, N.B., since Dec. 2, arranging for the starting of work in Canada. (Dec., 1911, pg. 141.)

Salisbury and Albert Ry.—The section of this line from Hillsboro to Albert, N.B., was re-opened for traffic, Dec. 4. (Dec., 1911, pg. 1141.)

South-East Kootenay Ry.—The British Columbia Legislature is being asked to extend the time within which the company may build the line authorized by chap. 63 of the statutes of 1906. Lennie and Clarke, Victoria, B.C., are solicitors for applicants. (Aug., 1906, pg. 457.)

Sydney and Louisburg Ry.—Track was laid on 2.5 miles of new line during 1911 from Morine station to Birch Grove, N.S. An extension of a branch from Summit to Waterford Lake, one mile, is under construction, and extensions to colliery 17 and colliery 20, each one mile, are projected. (Oct., 1911, pg. 937.)

Temiskaming and Northern Ontario Ry.—During 1911 the new track laid included the following:—North Bay Jct. to Nipissing Jct., 3.53 miles; Porcupine branch, Iroquois Falls to Timmins townsite, 33.71 miles. There has been under survey a route for a projected line from the main line to Elk Lake, about 30 miles. The Chairman of the Commission is reported to have stated in Toronto Dec. 7 that construction will be started on the new branch as early as possible in the spring. (Dec., 1911, pg. 1141.)

J. L. Englehart, Chairman of the Commission, returned to Toronto from a trip of inspection over the line Dec. 18. He is reported as having said that satisfactory progress was being made with the building of the extension of the Porcupine branch. Tracklaying was expected to start a few days after he left, and the extension should be completed early in Jan. The surveys in the Elk Lake country were being continued. We were advised, Dec. 20, that instrumental surveys for the extension of the line to Elk Lake were being completed, and that as soon as the reports are received by the Commissioners, location will not alone be made, but active efforts will be put in force for an early completion.

Vancouver and Peace River Ry.—Application is being made to the Dominion Parliament to incorporate a company with this title to build a railway from Vancouver, B.C., to the Fraser River in the vicinity of Lillooet, thence to Fort George, across the Parsnip River, through the Pine River Pass to Coalbrook in the Dominion Reserve Block, thence southeasterly to the Grand Prairie, Alta., on to Dunvegan, Peace River Crossing, and Fort Vermillion to Vermillion Chutes on the Peace River, with a branch from the middle branch of the South Pine River to Hudson's Hope on the Peace River. Abbott, Hart and Harg, Vancouver, are solicitors for applicants. (Sept., 1911, pg. 855.)

Application is being made to the British Columbia Legislature to incorporate a company to build a railway to be operated by any description of motive power, from Vancouver northeasterly to the Fraser River, near Lillooet, on to Fort George, northerly across the Parsnip River, through Pine Pass to Coalbrook in the Dominion Reserve Block, thence easterly to Swan Lake on the eastern boundary of the province, with a branch northerly from near Hudson's Hope to the eastern boundary of the province. Abbott and Hart McHarg, with Burns and Walkem, are jointly solicitors for the applicants.

Vancouver Underground Railway.—The British Columbia Legislature is being asked to incorporate a company to build a railway to be operated by any description of motive power, within a radius of seven miles from the corner of Hastings and Main streets, Vancouver, together with the necessary approaches, and to connect with the surface lines of railways and tramways, together with all powers and privileges usually given to railway companies. McEvoy, Whiteside and Buddle, Vancouver, are solicitors for applicants.

Victoria Harbor Railway.—The Victoria, B.C., city council had under consideration, Nov. 27, a report from the City Engineer on the plans for a railway along the city's harbor front. The plans show a main line from the outer wharf to a point on Selkirk water about midway between Garbally Road and Bridge St., with spur lines connecting with all railway lines entering the city. There are, says the City Engineer, no engineering difficulties in the way of construction so far as the city is concerned. It would be necessary for the city to pass a bylaw as to street crossings and street ends. At a previous meeting some objections were made by the council, and new detailed plans were made to meet them. The council will finally consider the plans after a vote of the ratepayers has been taken

Application is being made to the British Columbia Legislature to extend the

time within which the projected railway may be built.

Victoria reports state that the company is entirely local, having a capital of $1,000,000, of which $250,000 has been subscribed by leading business men in the city.

Winnipeg City Power Line.—The city board of control has under consideration tenders for the supply of 100 tons of relaying rails, 56 and 60 lbs., for delivery at Lac du Bonnet, Man. (Dec., 1911, pg. 1141.)

The Postmaster General on the Quebec Bridge.

Speaking at Quebec, Dec. 10, Postmaster General Pelletier said:—The contract for the substructure was given long ago to M. P. and J. T. Davis for $3,350,000, and the work is well under way. The contract for the superstructure was signed on Apr. 4 last for $8,650,000. The apparent contractor is the St. Lawrence Bridge Co., but there is another company associated with it. The date for the completion of the work is five years. I have had long interviews with the company's engineer, and he says that we may expect for certain reasons that the time will have to be extended at least one year more, which shows that whereas the Transcontinental Ry. will be practically finished within two years, the bridge cannot be ready before six years. The contractors are building an immense plant at Montreal for the erection of their bridge.

The contract as awarded has shut out tramway and vehicle transportation, and the late Government decided that in consequence of that change, which I understand was an indispensable condition, the province and city of Quebec should be refunded the amount which they had subscribed. I suppose it is too late now to change that, and we had better let the city and province get back their money. However, I understand that with a slight change tramway communications can yet be secured. On the whole, the bridge question will stand as a most improvident piece of statesmanship. The legacy of the late Government in this respect is as follows: $3,350,000 for the substructure, $8,650,000 for the superstructure, for a rather narrow bridge, and $6,000,000 already sunk and wasted, which makes a total of $18,000,000 for a bridge to be ready four or five years after the Transcontinental Ry. has been completed, and Quebec sidetracked in the interval, except inasmuch as we can provide for car transportation as they do at Detroit.

Duluth, South Shore and Atlantic Ry.—During 1911 the company built and laid track on 12.60 miles of spur lines, as follows: Soo Jct. to Hunter's Mill, Mich., 4.72 miles; Trout Creek to Woods, Mich., 5.50 miles; Basco to Woods, Mich., 1.33 miles; Ewen to Jensen's Mill, Mich., 0.92 mile; Derauson to Woods, Mich., 0.13 mile. (Dec., 1911, pg. 1131.)

The Grain Growers Export Co., Ltd., has been incorporated under the Dominion Companies Act, with $250,000 capital and office at Winnipeg, to deal in grain, and in connection therewith to own and operate vessels and other means of transportation, grain elevators, etc. The incorporators are W. G. Hall, J. Wright, W. H. Trueman, W. Hollands, T. W. Robinson, and E. Smith, Winnipeg.

The Macdonald Contracting Co. has been incorporated under the Ontario Companies Act with a capital of $40,000 and office in Toronto, to carry on a general contracting business. The provisional directors include:—W. R. Macdonald and F. M. Macdonald, sons of the late Randolph Macdonald.

Traffic Orders by the Board of Railway Commissioners.

The dates given for orders are those on which the hearings took place and not those on which the orders were issued.

BINDER TWINE RATES FROM WELLAND.

15286. March 15, 1910.—Re application of the Plymouth Cordage Co., of Welland, for an adjustment and reduction of freight rates on cordage and raw material to and from Welland, and for a re-hearing of the case, heard at Toronto, April 28, 1909, which was disposed of by order 7897, August 10, 1909.

It is ordered that the rates of the Grand Trunk Ry. and the Michigan Central Rd. to be charged on binder twine for harvesters, in bales or boxes, in carloads of the minimum weight of 30,000 lbs. per car of not over 36½ ft. inside length (subject to rule 1 (b) of Canadian Classification), from Welland, to points in Canada on their respective lines, and on the lines of other companies, the same being in either case within the territories covered by the current commodity tariffs on binder twine from Welland of the said companies respectively, shall not exceed the following to the same points, namely—the commodity rates on binder twine from Welland in effect at the date of this order; the 5th class rates from Welland; the rates on binder twine current from Auburn, via the Niagara frontier, less 2 cents per 100 lbs. The said companies shall comply with this order by publishing and filing special and joint tariffs to take effect not later than Dec. 15, 1911. The Wabash Rd. shall comply with this order in so far as it relates to shipments to points on the lines of its connections in Canada.

OIL RATES, ILLINOIS TO TORONTO.

15297. Nov. 9.—Re application of the Canadian Pacific Ry., under section 56 of the Railway Act, for leave to appeal to the Supreme Court of Canada, from order 14386, May 16, 1911, made upon the application of the British American Oil Co., and declaring the legal rate chargeable on carload shipments of crude oil from Stoy, Ill., to Toronto, Ont., was the fifth class joint through rate in effect at the time the shipments moved, and in accordance with Official Classification 29 and subsequent issues thereof. It is ordered that the C.P.R. be granted leave to appeal to the Supreme Court on the following question of law:—"What was the legal effect, if any, of the supplements filed by the Indianapolis Southern Rd., effective respectively Oct. 18, 1907, and May 14, 1908, on the joint through rate established by that company on oil from Stoy, Ill., to Toronto, Ont., on Jan. 20, 1907?"

COAL RATES TO STRATHCONA.

15332. Sept. 12, 1911.—Re application of Interprovincial Coal Company of Strathcona, Alta., for order directing that freight rate on coal from Clover Bar to Strathcona, Alta., over the Grand Trunk Pacific, the Canadian Northern, and the Canadian Pacific Railways, be changed from $27 per car to 40 cents per ton, or such rate as the Board may think reasonable. Upon hearing the application and reading the answers filed on behalf of the railway companies; and upon the report of the Chief Traffic Officer of the Board that the Canadian Northern Ry. has reduced its rate to 40 cents per ton, which includes the C.P.R.'s terminal switch at Strathcona, making the through rate 70 cents per ton or $21 per car of 30 tons. It is ordered that the application be dismissed.

CONSTRUCTION OF SIDING—FERTILIZER RATES.

15394. Nov. 14, 1911.—Re application of W. H. Haight, of Pipers Siding, B.C., under sec. 226 of the Railway Act, for an order directing the Great Northern Ry. to construct, maintain and operate a spur, or siding, to applicant's property near Pipers Siding and to provide lower rates on shipments of fertilizer from Vancouver and New Westminster to the said siding. It is ordered that the railway company shall construct, maintain and operate a spur, or branch line, to the applicant's property, the applicant to deposit in a chartered bank such sum of money as the parties may agree shall be necessary to defray the expenses of constructing and completing the spur. In the event of their failure to agree, the Board will fix the amount to be paid into the bank. The railway company shall repay or refund to the applicant one-half of the tolls charged by the company in respect of the carriage of traffic for the applicant over the said spur, or branch line, until the aggregate amount paid by the applicant in the construction and completion of the spur shall have been repaid to him; the applicant, or the railway company, shall file a plan, with profile and book of reference, showing the proposed location of the spur; and publication of notice of the application may be dispensed with.

The railway company shall publish and file, not later than Dec. 1, 1911, at Ottawa, a commodity rate of 3 cents per 100 lbs. on ashes for fertilizing purposes, minimum weight, 40,000 lbs. per carload; 2½ cents per 100 lbs. on horse manure, minimum weight, 30,000 lbs. per carload; and 2½ cents per 100 lbs. on other stable manure, minimum weight, 40,000 lbs. per carload—from Vancouver and New Westminster to the said siding.

Order 15579 Dec. 6, 1911, extended the time for publishing and printing the rates directed in order 15394 to Jan. 1, 1912.

COAL SWITCHING CHARGES AT PRESCOTT.

15472 Nov. 23.—Re application of certain coal dealers of Prescott, Ont., complaining that the charge by the C.P.R. of 20 cents a ton for shunting coal in its yards when received from the New York Central & Hudson River Rd., is excessive; and applying for an order directing the railway company to reduce its charge for such service. It is ordered that the C.P.R. Company within 30 days reinstate the rate shown in its tariff, C.R.C. no. E 1234, effective Sept. 1, 1908, of 15 cents a net ton, minimum $3 a car.

COAL RATES FROM ROUSE'S POINT.

15540. Nov. 25.—Re application of Canadian Retail Coal Association, complaining that rate charged by the G.T.R. on shipments of coal from Rouses Point and Massena Springs to Alexandria is excessive and discriminatory as compared with the rate charged from these points to Ottawa. It is ordered that the G.T.R.'s special tariff on coal and coke from Rouses Point, N.Y., be amended so as not to exceed the following rates per ton of 2,240 lbs. to the designated stations, the rates to be made effective not later than Jan. 15, 1912, viz.:—

To Ste. Justine, Que., anthracite, 85c.; bituminous, 75c.

To Glen Robertson, Ont., anthracite, 90c.; bituminous, 80c.

To Dalkeith, Ont., anthracite, 90c; bituminous, 80c.

To Vankleek Hill, Ont., anthracite, 95c.; bituminous, 85c.

To Alexandria, Ont., anthracite, 90c; bituminous, 80c.

To Greenfield, Ont., anthracite, 95c.; bituminous, 85c.

To Maxville, Ont., anthracite, 95c.; bituminous 85c.

The Alberta Legislature has under consideration a measure providing for the creation of a Department of Railways and Telephones.

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ADVERTISING COPY must reach the publishers by the 10th of the month preceding the date of publication, if proof is required, or by the 15th if proof is not required.

TORONTO, CANADA JANUARY, 1912.

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Changes in Location of Matter.

Beginning with this issue the alphabetical list of advertisers, which has heretofore been published on this page in the centre of the paper, appears on the last page of the paper, which is more convenient for quick reference.

The Purchasing Agents' Guide to the manufacturers of and dealers in steam and electric railway, marine, express, telegraph and contractors' supplies appears on pages immediately preceding the alphabetical list of advertisers.

Telephone Train Dispatching on the C.P.R.

As illustrative of the absurd character of much of the information about railway matters published in the daily press may be quoted a dispatch from St. John, N.B., of Dec. 7, to which wide publicity was given, stating that the telephone train dispatching which had been in use on the C.P.R., had been abandoned, and that the telegraph system of dispatching has been returned to, the telephone system having been found unsatisfactory. There was absolutely no foundation whatever for the dispatch referred to. The system of telephone train dispatching on the C.P.R. has proved entirely satisfactory to the Operating Department, and will doubtless be considerably extended to other parts of the system during the current year.

An officer of the company writes us as follows: "The telephone dispatching on the Atlantic Division has been a complete success in every respect. It was so good that we were enabled to dispense with one dispatching office for the summer months and handle all the main line dispatching on this division from one office. The business, however, is too heavy to continue this during the winter months and we are reopening the dispatching office at St. John. The telephone line was adjusted to work from Brownville Jct. to St. John, and while it was being readjusted, so that we could work it from St. John to McAdam Jct., it was necessary to use the telegraph between these two points for a couple of days until the change in the telephone system was made."

Dates of Railway Commisioners' Orders.

The dates given on the orders issued by the Board of Railway Commissioners are not those of the days on which the orders are actually issued, but are the dates on which the cases were heard For example, order 15286, respecting binder twine rates from Welland, Ont., is dated Mar. 15, 1910, that being the date on which the case was heard at Ottawa, but the order was not issued until Nov. 8, 1911.

It would undoubtedly be much better for the orders to be dated the actual days of issue. A reference to the date of the hearing might be appended, if thought desirable, but the most important date is that of the issue of the order, as that is when it generally goes into effect.

It is misleading to have an order which did not go into effect until Nov. 8, 1911, dated Mar. 15, 1910.

When the Board started issuing orders they were not numbered at all. We suggested that the orders be given consecutive numbers, and the suggestion was acted on. We hope our present suggestion will also meet with approval.

The city of Edmonton is applying to the Alberta Legislature for confirmation of a bylaw granting exemption from taxation, with certain other privileges to the Grand Trunk Pacific Delevopment Co. A similar act is being applied for by the G.T.P.D. Co.

Transportation Conventions in 1912.

Mar. 17.—American Association of Railroad Superintendents, Chicago, Ill.

Mar. 19-21.—American Railway Engineering Association, Chicago, Ill.

May 12.—Railway Industrial Association, Kansas City, Mo.

May 14-17.—Master Boiler Makers' Association, Pittsburgh, Pa.

May 15.—Freight Claim Association, Buffalo, N.Y.

May 22.—Association of Railway Claim Agents, Los Angeles, Cal.

June 12-14.—Master Car Builders' Association, Atlantic City, N.J.

June 16-18.—Wood Preservers' Association, Chicago, Ill.

June 17-19.—American Railway Master Mechanics' Association, Atlantic City, N.J.

June 18.—Train Dispatchers' Association of America, Louisville, Ky.

June 18-21.—American Association of Freight Agents, Chicago, Ill.

June 24.—Association of Railway Telegraph Superintendents, New York City.

June 26.—Association of American Railway Accounting Officers, Quebec, Que.

Aug.—Travelling Engineers Association.

Sept.—Master Car and Locomotive Painters' Association of United States and Canada.

Sept. 10.—Roadmasters' and Maintenance of Way Association, Buffalo, N.Y.

Oct.—American Railway Bridge and Building Association, Baltimore, Md.

Nov. 6-10.—Association of Railway Electrical Engineers, Chicago, Ill.

Nov. 15.—American Railway Association, Chicago, Ill.

Dec. 12-13.—Association of Transportation and Car Accounting Officers, Louisville, Ky.

Railway and Allied Associations, Clubs, Etc.

The names of persons given below are those of the secretaries.

CANADIAN CAR SERVICE BUREAU, J. E. Duval, 401 St. Nicholas Building, Montreal.

CANADIAN FREIGHT ASSOCIATION, T Marshall, Union Station, Toronto.

CANADIAN FREIGHT ASSOCIATION, (Western Lines), W. E. Campbell, 101 Bon Accord Building, Winnipeg.

CANADIAN RAILWAY CLUB, J. Powell, St. Lambert, Que. Meetings at Montreal 2nd Tuesday each month, 8.30 p.m., except June, July and August.

CANADIAN SOCIETY OF CIVIL ENGINEERS, C. H. McLeod, 413 Dorchester St., west, Montreal.

CANADIAN STREET RAILWAY ASSOCIATION, Acton Burrows, 70 Bond Street, Toronto.

CANADIAN TICKET AGENTS' ASSOCIATION, E. de la Hooke, London, Ont.

CENTRAL RAILWAY AND ENGINEERING Club of Canada, C. L. Worth, 409 Union Station, Toronto. Meetings at Toronto 3rd Tuesday each month, except June, July and August.

EASTERN CANADIAN PASSENGER ASSOCIATION, G. H. Webster, 54 Beaver Hall Hill, Montreal.

ENGINEERS' CLUB OF MONTREAL, R. W. H. Smith, 9 Beaver Hall Square, Montreal.

ENGINEERS' CLUB OF TORONTO, R. B. Wolsey, 94 King St. west, Toronto.

QUEBEC TRANSPORTATION CLUB, J. S. Blanchet, Quebec.

WESTERN CANADA RAILWAY CLUB, W. H. Rosevear, 25½ Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August,

Mainly About Transportation People.

Sir Wm. Whyte has been elected President of the St. Andrew's Society of Winnipeg.

Sir Wm. Whyte has been re-elected a director of the St. Charles Country Club, Winnipeg.

Hugh Sutherland, Executive Agent, Canadian Northern Ry., Winnipeg, and Mrs. Sutherland, expect to sail Jan. 20 for Egypt.

U. Barthe, formerly Secretary of the Quebec Bridge Co., has been appointed collector of succession taxes for the district of Quebec.

W. Cuthbert, Montreal, is reported to be retiring from the G.T.R. after having been 37 years in the service, latterly as Fuel and Tie Agent.

D. C. Dawson, District Traffic Superintendent, Western Union Telegraph Co., St. John, N.B., is taking an extended holiday for rest and change.

C. C. LeBree, of the Canadian North-Eastern Ry. freight and passenger department, Stewart, B.C., arrived in Toronto, Dec. 15, for a holiday.

Jos. Bishop, who died at Crysler, Ont., recently, was father of W. J. Bishop, of the National Transcontinental Railway survey staff at Cochrane, Ont.

Col. Alex. Bertram, of the John Bertram and Sons Co., Ltd., has been re-elected on the executive committee of the St. John's Ambulance Association.

R. Cummings, stationmaster at Truro, N.S., completed his fortieth year of service with the Intercolonial Ry. and its predecessor, the Nova Scotia Ry., Dec. 1.

J. McKibbin, a C.P.R. brakesman, was, Dec. 6, presented with the Royal Humane Society's bronze medal, for saving life at Parkdale, Ont., June 7, 1911.

Mrs. J. Mallon, who died in Toronto recently, was the mother of Mrs. J. J. Scully, wife of the C.P.R. General Superintendent at Moose Jaw, Sask.

H. H. Vaughan, assistant to the Vice President, C.P.R., accompanied by Mrs. Vaughan, returned to Montreal from England, by way of New York, early in December.

F. W. Morse, formerly of the G.T.R. and G.T. Pacific Ry., and now Vice President and General Manager, Chicago and Alton Rd., was in Montreal recently.

G. T. Pettigrew was presented with a diamond scarf pin by the business men of Stratford, Ont., on his recent removal to Montreal, as G.T.R. Division Freight Agent.

J. L. Englehart, Chairman, Temiskaming and Northern Ontario Ry. Commission, addressed the Canadian Club at Hamilton, Ont., Dec. 7, on the Land of Timiskaming.

J. S. Leighton, jr., who recently resigned the position of Claims Agent for the Intercolonial Ry., has been appointed Managing Editor of the Sentinel, Woodstock, N.B.

C. N. Armstrong, who was the principal promoter of the old Atlantic and Lake Superior Ry. project, and Mrs. Armstrong, returned to Montreal, from England, recently.

J. D. Cogger was presented with a gold watch by the G.T.R. and Intercolonial Ry. freight offices staffs at Montreal, in which he was chief clerk, on his leaving the service, Dec. 7.

R. W. Leonard, Chairman, National Transcontinental Ry. Commission, has offered to erect a tower with a chime of bells for Grace Church, Brantford, Ont., in memory of his parents.

Dr. Milton Hersey, Consulting Chemist, C.P.R., Montreal, is reported to have given $1,000 for the improvement of the Kingston, Ont., School of Mines chemical department industrial laboratory.

Julius Kruttschnitt, Vice President and director of Maintenance and Operation of the Harriman lines, has moved his residence from Chicago to New York City, which is now his headquarters.

E. D. Nash, for a number of years Assistant Superintendent of the Southern Division of the Central Vermont Ry., at New London, Conn., died in Panama recently, following an operation for stomach trouble.

P. C. Caron, station master, Bonaventure station, Montreal, died there suddenly, Dec. 3. He had been in the G.T.R. service for 36 years, and for the past 12 years had been station agent at Bonaventure.

C. R. Moore, who was recently appointed chief clerk to Vice President Kelley, G.T.R., Montreal, has been presented with a gold watch by his former associates in the G.T.R. Superintendent's office, Toronto.

S. James, who died at Hamilton, Ont., recently, was for a number of years private secretary to James Stinson, of Chicago, Ill., who was associated with the promotion of railway enterprises in Hamilton many years ago.

W. S. Kemp, who has just retired from active service on the Elgin Joliet and Eastern Ry., was over 20 years ago Assistant Superintendent and Divisional Superintendent Great Northern Ry., St. Paul and Manitoba Division.

E. Rawlings, President, Guarantee Co. of North America, who died in Montreal, Dec. 12, was a director of the Montreal Telegraph Co. One of his daughters is married to A. P. S. Glassco, of the G.T.R. engineering staff, Hamilton, Ont.

F. Cooper was presented with a gold chain and locket by the heads of the C.P.R. departments in London, Ont., on his transfer from the position of Resident Engineer there to that of Resident Engineer, District 2, at Montreal.

W. B. McKenzie, Chief Engineer, Canadian Government Railways, addressed a meeting of the Central Farmers' Institute at Charlottetown, P.E.I., on "Good Roads," recently, as representing A. W. Campbell, Deputy Minister of Railways.

H. Lennox, K.C., M.P. for South Simcoe, Ont., has been elected chairman of the House of Commons Committee on Railways and Canals for the current year. R. Blain, M.P. for Peel, Ont., is chairman of the Committee on Forests and Waterways.

F. E. Gibbs, who has been appointed Chief Grain Inspector, Western Division, at Winnipeg, was entertained by the Fort William, Ont., board of trade recently, on his leaving the position of Grain Inspector there, which he had held for a number of years.

A. M. Grantham, formerly Purchasing Agent and Superintendent of Construction, Toronto Ry., and J. Brooks, have bought the hardware business of the Canada Glass Mantles and Tiles, Ltd., Toronto, and will carry on the same as the Canada Hardware, Ltd.

Sir Wm. Van Horne, R. B. Van Horne, G. M. Bosworth, W. Shaughnessy, and W. R. McInnes, are among the incorporators of the Canadian Sardine Co., which has been formed under the Dominion Companies Act to operate a sardine packing plant at Chamicook, near St. Andrews, N.B.

D. O. L'Esperance, who was elected recently M.P. for Montmagny, Que., was entertained at dinner in Quebec city recently by the International Order of Railway Telegraphers, of which he is a member. He was in the Intercolonial Ry. service from Oct., 1885, to April, 1902.

O. M. Lang, General Superintendent, Central New England Ry., a subsidiary of the New York, New Haven and Hartford Rd., who died at Hartford, Conn., Dec. 15, of typhoid, was born at London, Ont., July 28, 1872. He entered railway service in the United States in 1890, with the Chicago, Burlington and Quincy Rd.

Sir William Mackenzie, President, Canadian Northern Ry., and D. B. Hanna, Third Vice President, sailed from Halifax, N.S., for Bristol, by the s.s. Royal George, Dec. 13. Sir William will spend Christmas with Lady Mackenzie and some of their family in Paris. Mr. Hanna expects to sail from England on his return Jan. 10.

J. B. Elliott was presented with a couch and a chair by the C.P.R. locomotive engineers running in and out of Ottawa, on the occasion of his recent retirement from active service as Master Mechanic at Montreal. He began work as a boy with the old Brockville and Ottawa Ry., and remained with that company and its successors for 46 years.

Sir Donald D. Mann, who underwent an operation on Oct. 30, had sufficiently recovered to spend a short time at his office Dec. 12. On Dec. 14 he left Toronto for San Francisco in his private car Athabasca, accompanied by Lady Mann, their son, Miss Nesbitt, of Woodstock, and his secretary. He will probably spend most of January in California.

F. E. Snow, who died in Detroit, Mich., Dec. 1, where he was interested in electric railway building, was in early life employed by the Great Western Ry. and the Wabash Rd., and was General Passenger Agent of the Canada Southern Ry. when it was taken over by the Michigan Central Rd. One of his sons, M. B. Snow, is Assistant General Superintendent Michigan Central Rd.

A. W. Carpenter, carrying on business as the Charing Cross Bank, London, Eng., which closed its doors Oct. 17, 1910, has been sentenced to two years imprisonment for fraud and false pretences in connection with the bank's business. The bank was financing the Atlantic, Quebec and Western Ry., the Gaspe harbor development, and some industrial concerns in the Gaspe peninsula, Que.

James Edward, who has been appointed Commercial Agent, G.T.R., Moncton, N.B., entered G.T.R. service Sept. 1, 1883, since when he has been, 1885, telegraph operator at Omemee Jct., Ont., and other points; 1885 to 1892, station agent at Lakefield, Ont., and other points; 1892 to 1903, Agent, Great Eastern Fast Freight Line and Contracting Freight Agent, G.T.R., Montreal; 1903 to 1904, Traveling Freight Agent, Montreal, and 1904 to Nov. 29, 1911, Traveling Freight Agent, Moncton, N.B.

Benjamin Douglas, M. Am. Soc. C.E., for many years Bridge Engineer of the Michigan Central Rd., and more recently Tunnel Engineer for the Detroit River Tunnel Co., was killed recently by a fall from a bridge near Capoere, Brazil. He was born in Detroit, Mich., in 1859, and graduated from the University of Michigan in 1882. In 1885 he became Bridge Engineer of the Michigan Central Rd., which position he held until 1905, when he was appointed Tunnel Engineer on the construction of the Detroit River tunnel. Since 1910 he carried on a private consulting practice, with office in Detroit.

A. M. Sutherland, who recently resigned the position of Assistant Superintendent, Western Division, Duluth, South Shore and Atlantic Ry., Thormaston, Mich., to go into farming, was born at Hartford, Conn., Apr. 2, 1844, and entered railway service in 1861, since when he has been, to 1865, track laborer, G.T.R.; 1865 to 1867, mining; 1867 to 1870, section foreman, Chicago and North Western Ry.; 1870 to 1872,

locomotive fireman, and 1872 to 1881, locomotive driver, same road; 1881 to 1889 Roadmaster, same road; 1889 to Dec., 1911, Assistant Superintendent, D.S.S. and A.R., Thormaston, Mich.

W. W. Walker, who has been appointed Vice President and General Manager, Duluth. South Shore and Atlantic Ry. and Mineral Range Rd., Duluth, Minn., was born at St. Catharines, Ont., June 3, 1868. He began railway work in 1883 with the G.T.R., and in 1884 entered the service of the Queen and Crescent Route, where he was to 1887 in the traffic department. From 1887 to 1888 he was in the Chicago and North Western Ry. claim department, and from Oct., 1888, to Feb., 1890, was rate clerk and chief clerk, Great Northern Ry. He was appointed Travelling Freight Agent, D.S.S. and A.R., Nov., 1890, Assistant General Freight Agent, 1897, and from July, 1901, to Dec. 1, 1911, was General Freight Agent at Duluth, Minn.

Duncan MacPherson, M. Can. Soc. C.E., and a member of its council, who has been appointed Assistant to the Chairman, National Transcontinental Railway Commission, was born at Bath, Ont., Feb. 2, 1858, and entered railway service, Nov., 1880, since when he has been, to Feb., 1881, rodman on Canada Central Ry. surveys on the extension west of Pembroke, Ont.; Feb., 1881, on the incorporation of the C.P.R., when the Canada Central Ry. was taken over, to Aug., 1882, rodman on revision of location and construction, leveller, transitman and engineer in charge of a section of final location and construction of the C.P.R.; Aug., 1882 to 1886, Assistant Engineer of about 400 miles of line, then constituting the C.P.R. Eastern Division; 1886 to July, 1905, Division Engineer in charge of maintenance of way, track, bridges, buildings, etc., Eastern Division, and construction of branch lines; Aug., 1905, to Dec., 1911, Assistant Chief Engineer, National Transcontinental Ry. He graduated from the Royal Military College, Kingston, Ont., in 1880, being first in engineering.

C. W. Houston, who has been appointed Superintendent, Duluth, Rainy Lake and Winnipeg Ry., Virginia, Minn., was born at Hardwick, Vt., Jan. 15, 1858, and entered railway service June, 1875, since when he has been, to Oct., 1883, consecutively, telegraph operator, agent, brakeman, fireman and conductor on the Portland and Ogdensburg Ry., Chicago, Milwaukee and St. Paul Ry., Minneapolis and St. Louis Rd., and Burlington, Cedar Rapids and Northern Ry.; Oct., 1883, to Sept., 1891, dispatcher, B.C.R. and N. Ry.; Sept., 1891, to July, 1904, consecutively, dispatcher, Chief Dispatcher and Trainmaster, Northern Pacific Ry.; Sept. to Dec. 31, 1904, dispatcher, Great Northern Ry.; Apr., 1905, to Mar., 1907, dispatcher and Trainmaster, El Paso and Southwestern Rd.; Mar., 1907, to Dec., 1909, consecutively, dispatcher, conductor and Trainmaster, Mexican Central Ry.; Jan. to Nov., 1910, dispatcher and Chief Dispatcher, Frisco Lines; Nov., 1910, to Feb., 1911, rule instructor, Canadian Northern Ry.; Feb. to Dec., 1911, Chief Dispatcher, Duluth, Rainy Lake and Winnipeg Ry.

M. B. Murphy, Superintendent, District 2, Canadian Northern Ry., Winnipeg, whose portrait appears on this page, was born at Napa, Cal., Sept. 11, 1866, and entered railway service, Jan. 24, 1880, since when he has been, to Jan., 1895, successively, operator, agent, brakeman, conductor, yardmaster, dispatcher, chief dispatcher, and connected with the construction department in charge of construction of the Nantaskett Branch, Union Pacific Rd.; Jan., 1895, to Mar., 1898, county clerk, Carbon county, Wyo., and subsequently enrolling and engrossing clerk in charge of the compilation of the session laws of the fourth Legislature of Wyoming; Mar. to July, 1898, dispatcher, Union Pacific Rd.; July to Nov., 1898, in charge of locomotive performance statistics, Chicago, St. Paul, Minneapolis and Omaha Ry., Itasca, Wis.; Nov., 1898, to Jan 16, 1899, operator and dispatcher, Eastern Minnesota Ry. West Superior, Wis.; Jan. 16, 1899, to July 31, 1900, dispatcher and Chief Dispatcher, Northern Pacific Ry., Staples, Minn., and Glendive, Mont.; July 31 to Nov., 1900, Chief Dispatcher, Union Pacific Rd., Green River, Wyo.; Nov., 1900, to Jan., 1903, Chief Dispatcher, Denver and Rio Grande Rd., Minturn, Colo.; Jan., 1903, to Sept. 20, 1906, Chief Dispatcher and Trainmaster, El Paso and Northeastern Rd., Alamogordo, New Mexico; Sept. 20, 1906, to Jan. 1, 1910, Trainmaster, Mexican Central Ry., Chihuahua, Mexico; Jan. 1 to Apr., 1910, General Yardmaster, Omaha, South Omaha and Council Bluffs terminals, Chicago and Great Western Ry.; May 1, 1910, to Feb. 27, 1911, Trainmaster, District 2, Canadian Northern Ry., Winnipeg, and during

P246 M. B. Murphy,
Superintendent, District 2, Canadian Northern Ry., Winnipeg.

Aug. and Sept., 1910, acting Superintendent, C.N.R., at Winnipeg; Feb. 27 to Nov., 1911, Superintendent, Duluth, Rainy Lake and Winnipeg Ry., Virginia, Minn.

The Central Railway and Engineering Club of Canada held its annual meeting in Toronto Dec. 19. J. Bannon, chief engineer of the heating plant, etc., in the Toronto City Hall, was elected President; A. Taylor, foreman, boiler shop, Polson Iron Works, First Vice President, and E. Logan, foreman, G.T.R. shops, Toronto, Second Vice President. Of the seven members of the executive committee elected, only one is in railway service, namely, W. C. Sealy, General Foreman, G.T.R., Toronto. The club donated $120 to various charities.

T. H. Watson, Manager, Canada Bolt and Nut Co.'s Branch Steel Co. of Canada, Ltd., has resigned, and has been elected Vice President and Managing Director of the Spanish River Pulp and Paper Mills, Ltd. He will continue to have his headquarters in Toronto.

Northern Railway Lines in Canada

Fort William, Ont.—At a civic dinner, Dec. 1, A. Vickers stated that plans were being prepared by another railway company for bringing its lines into Fort William, from the United States. Survey parties had been in the field between Fort William and the International boundary, and it was likely that something would be heard of the project officially early in the year. It is said that the G.N.R. is the company referred to.

Midland Ry. of Manitoba—Midland Great Northern Ry.—The company expected to have eight miles of tracks on its line into Winnipeg laid by Dec. 31.

As a matter of fact a direct train service into the company's own freight terminals in Winnipeg was put in operation Dec. 4, though the line was not then fully completed, as the track had not been laid down quite to the sheds. The line is expected to be fully completed by the end of Jan., with the exception of the steel bridge over the Assiniboine River. This bridge will have a 240 ft. draw span, and two other spans, one of 105 ft. and one of 60 ft., the steel for which has been delivered. The temporary bridge erected for construction purposes will be used until the steel bridge is completed.

Moose Jaw, Sask.—A press report states that engineers and other officials of the company have been in Moose Jaw for some little time looking into the question of a line into that place.

Nelson and Fort Sheppard Ry.—Press reports state that the Northern Pacific Ry. has begun a freight service into Nelson, B.C. C. W. Breckenridge, one of the company's traveling freight and passenger agents, was at Nelson, Dec. 7, and stated that the N.P.R. had running rights over the G.N.R. lines from Spokane to Nelson and Rossland.

Vancouver, Victoria and Eastern Ry. and Navigation Co.—The construction work for 1911 included the laying of 12 miles of track from Princeton to Coalmount, B.C., and we were recently officially advised that it was expected to have six miles of track laid on the coast section of the line from Abbottsford westerly to Kilgard, B.C., by Dec. 31.

The final revision survey for the line across Hope Mountains was completed Dec. 6 by W. W. Auburn and M. A. Butler. In an interview, Dec. 14, J. H. Kennedy, Chief Engineer, is reported as having said that the uncompleted gap between Tulameen and the Hope Mountains, 76 miles, could be finished within two years. The reports and surveys now completed would be forwarded to St. Paul for approval. The line will follow the Coquihalla River, with a maximum gradient of 2.2%. There will be 14 short tunnels and one of over 1,000 ft. in length. (Dec., 1911, pg. 1129.)

Dominion Railway Subsidies.—A contract, under the act granting aid towards the building of certain railways, was entered into Nov. 11, 1911, between the Dominion Government and the Orford Mountain Ry. for the building of an extension from Mansonville, Que., to the International boundary, 3.12 miles. This line was built some time since.

The New York Central and Hudson River Rd. Co. has issued a circular to the holders of its $110,000,000 3½% collateral trust bonds, which were given in exchange for stock of the Lake Shore and Michigan Southern and Michigan Central roads, asking their consent to merge either or both roads with the parent company.

The Minister of the Interior is credited with stating in Winnipeg, Dec. 23, that J. D. McArthur will be authorized to go on at once with his contract for the first section of the railway from the Pas Mission, Sask., towards Hudson Bay.

Canadian Pacific Railway Construction, Betterments, Etc.

Halifax, N.S., to Moncton, N.B.—Local press reports in Halifax, N.S., state that engineers have gone over the route of a line to connect Halifax with Moncton, N.B., by means of extensions of the Dominion Atlantic Ry. The route gone over is stated to have included the Stewiacke Valley, between Amherst and Truro, and it is said that it is possible to secure a gradient equal to that of the National Transcontinental Ry. for the entire distance.

Aroostook Jct., N.B.—The Board of Railway Commissioners has authorized the C.P.R. to expropriate certain lands near the line at Aroostook Jct., N.B., for the erection of new buildings.

Weston-Lambton Branch.—We are officially advised that it is likely a line will be built in the near future for connecting the Toronto-Windsor line and the Toronto-Sudbury line. A route has been surveyed for this line, starting from near Islington, on the Toronto-Windsor line, northerly to near Weston, about 4.5 mile Application is being made to the Board of Railway Commissioners for approval of the route.

Orford Mountain Ry.—The extension from Mansonville, Que., to the International boundary, 3.12 miles, for which a contract, under the act granting aid to certain railways, was entered into with the Dominion Government, Nov. 11, has already been built, and it is being operated as part of the C.P.R. system.

Campbellford, Lake Ontario and Western Ry.—Plans are being prepared for filing with the Board of Railway Commissioners for this projected railway. The plans will show a route starting from the Montreal-Toronto line at Glen Tay, to which point the second track work from Montreal is being completed, and proceeding southwesterly to Belleville, and along the lake shore, rejoining the Montreal-Toronto line near Leaside Jct. It was reported that the plans had been filed Dec. 4, but J. W. Leonard, assistant to the Vice President, Eastern Lines, was reported as stating, Dec. 8, that some points on the route had not been finally decided upon, and that the plans would not be filed for about a month. A map showing the route of the line through Belleville has, however, been filed in the Registry office there.

Georgian Bay and Seaboard Ry.—A freight service was placed in operation on this newly completed line early in Dec., and it is expected that a passenger service will be arranged for early in the new year. The line from Victoria Harbor to Coldwater Jct., on the Toronto-Brantford line, has been operated for nearly two years. From Coldwater Jct. the line passes easterly and southerly via Orillia and Lindsay, to Bethany Jct., on the Montreal-Toronto line. It has a total length of 81 miles. The wharves, grain elevators and terminal facilities are on the shores of Victoria Harbor, where a new town is springing up, to which the name of Port McNicoll has been given.

Toronto Office Building.—The office building being erected on the corner of Yonge and King Streets, an illustration of which is given on this page, will be 16 stories. It will have a frontage of 120 ft. on Yonge St., and of 75 ft. on King St. West. It will be of steel construction, with granite columns 30 ft. high on both frontages, above which the building will be of semi-glazed terra cotta. The two lower floors will be wide open to the daylight, the walls being formed of large sheets of glass framed in steel. The entire construction will be fireproof, the floors being of concrete. The double doorway on the ground floor gives a diagonal passage between the two streets. The ground floor will be used by the company, including ticket offices for the railway the lake and ocean steamships, and the telegraph offices, and the second floor will be used by the District Passenger Agent and his staff. The other floors will be let as offices, the top storey, which will be 18 ft. high, will be devoted to the C.P.R. telegraph operating department.

South Ontario Pacific Ry.—The Board of Railway Commissioners has recommended the Governor-in-council to approve the lease of the S.O.P. Ry. to the C.P.R. This line is under construction from Guelph Jct. to Hamilton, Ont.

Owen Sound Elevators.—The C.P.R. elevators A and B, at Owen Sound, Ont., were destroyed by fire, with their contents, Dec. 11. The loss is given approximately as $1,000,000, of which

Canadian Pacific Railway Office Building, King and Yonge Streets, Toronto.

about half is for grain. Elevator A was built in 1884, and B in 1897. In connection with the latter elevator, a bonus of $40,000 and other concessions were granted by the town, and it is stated that under the agreement the C.P.R. will either have to rebuild elevator B. or refund the greater portion of the bonus. The whole property was covered by insurance, and J. Richardson and Sons, Kingston, who owned most of the grain, have purchased the grain salvage.

Collingwood Southern Ry.—Representatives of the Collingwood Board of Trade waited on D. McNicoll, Vice President, C.P.R., at Montreal, recently to discuss the question of the building of a line into Collingwood, Ont. They subsequently reported that the C.P.R. management had the proposition under consideration. Such a line would cost $800,000, on which cost the company asked a net revenue of 5%. M. H. Brown, Division Freight Agent, C.P.R., was in Collingwood Dec. 9, collecting information as to the possible traffic.

It is suggested that the line connect with the Toronto-Sudbury line near Baxter. The C.S. Ry. Co. was incorporated in the C.P.R. interests some years ago to build such a connection.

Fort William Coal Handling Plant.—An additional coal handling pant is to be built at Fort William, Ont. Press reports state that the estimated cost is $500,000. The plant will, it is said, involve the building of a bridge, two car dumping unloaders, coal conveyor cars, and trestle. The plant, it is stated, will be operated by electricity. The Wellman-Seaver-Morgan Co., Cleveland, Ohio, have the contract.

Winnipeg Terminals.—In connection with the reports as to the laying out of new freight terminals some miles out of Winnipeg. We understand that a comprehensive scheme for providing additional facilities is under contemplation. Nothing, however, has been decided, either as to location, or the area of the yards.

Regina to International Boundary.—It is not the present intention to build a line from Regina, Sask., to the International boundary, as stated in press reports.

Asquith to Battleford, Sask.—A press dispatch, Dec. 15, states that it is the company's intention to build a line from near Asquith to Battleford, Sask., and thence across the river to North Battleford.

Swift Current to Bassano.—Press reports state that plans have been approved for a line from Swift Current, Sask., to Bassano, Alta.; that construction is in progress, and that when completed it will form the main route for east and west traffic, instead of the present route via Medicine Hat. A branch line has been built from Swift Current northwesterly for 45 miles, and we understand that it may be projected on to a point on the Calgary section This branch is built to a 0.4 gradient so that if completed certain traffic might be routed over it, as it would be an easier line than the present one. If the line is completed through it will be only three or four miles shorter, instead of between 40 and 50 miles, as press reports state, than the present route.

Strathcona - Edmonton High Level Bridge.—Reports from Strathcona, Alta., state that it will take over 1,000 cars to transport the steel for the superstructure of the high level bridge on the line to connect Strathcona and Edmonton. There are, it is said, 400 carloads of material on the way, in addition to about 100 which had been unloaded to Dec. 8. The contractors have done considerable preparatory work, and it was expected that everything would be ready so that erection of the superstructure could be started Jan. 1, and proceed without any interruption.

F. W. Peters, Assistant to the Vice President, Winnipeg, is reported as having informed the Edmonton city council, Dec. 4, that it was expected to have the bridge completed by the end of 1912. Other bridges on the line connecting the two towns were expected to be completed in the spring.

Edmonton Terminals, etc.—The Edmonton city council, it is reported, expects to receive plans early in the new year, showing the layout of yards at North St., the plans of the station building, and for an office building on Jasper Ave.

Sedgewick Southerly.—Application is being made to the Dominion Parliament for authority to build a line from Sedgewick, on the Hardisty subdivision, southerly to tp. 40 or 41, range 12 or 13, west of the 4th meridian, Alta.

Calgary Shops.—S. E. Junkin, Vice President of Westinghouse, Church, Kerr Co., New York, was in Winnipeg, Dec. 12, in consultation with George Bury, Vice President and General Manager, C.P.R. In a subsequent interview Mr. Junkin is reported as having said that his firm had prepared plans for the preliminary layout of the shops at Calgary, Alta. The railway company had evinced a broad, generous policy in connection with the enterprise, and the shops would be the most nearly perfect of any railway shops on the continent. Every provision would be made for the prompt handling of the work, and for the convenience of the workmen. What his company would have to do in the future in connection with the building of the shops, would depend wholly on the wishes of the C.P.R.

Winnipeg papers, Dec. 15, stated it was announced that morning, that the contract for building the shops had been let to the Westinghouse, Church, Kerr Co. The plans, it is said, provide for the erection of a boiler house, locomotive shop, general stores building, power house, two freight car shops, two passenger car shops, pattern shop, foundry, planing mill, wheel and tender shop, electrical shop, besides a number of smaller buildings.

We were officially advised, by telegraph, Dec. 23, that a contract had been let to Westinghouse, Church, Kerr Co.

Kootenay Central Ry.—We are officially advised that a contract has been let to Foley Bros., Welch and Stewart for grading from Fort Steele to Skookumsbuck, B.C., 21 miles.

Coquitlam, B.C., Shops, Yards, etc.—F. F. Busteed, General Superintendent, in a recent interview, is reported to have said that the company was badly in need of additional yard and other space in Vancouver and vicinity, and that the clearing and construction work at Coquitlam would be rushed as fast as possible. M. P. Cotton and Co., Vancouver, were reported to have several groups of men at work clearing the site Dec. 8.

C.P.R. Hotels.—G. M. Bosworth, Vice President, whose jurisdiction was recently extended to include the hotel system, completed a trip of inspection over the line to Vancouver, B.C., Dec. 15. The work at present being carried out on the hotels includes a new kitchen annex at the Algonquin, St. Andrews, N.B.; the enlargement of the Place Viger, Montreal; the enlargement of the Royal Alexandra, Winnipeg, and the enlargement of the Hotel Empress at Victoria. A permit has been applied for for the building of a new wing for the Hotel Vancouver, in Vancouver, and work has been started on a new hotel in Calgary, Alta.

The plan for the Calgary hotel shows that it will be 13 stories, rising to a height of 169 ft., and will have a frontage of 228 ft. and a depth of 164 ft. At first the hotel will be completed only as far as it is desired to open it for business as early as possible. The building is beautifully laid out, and, it is expected, will afford ample accommodation for years to come. The frame will be of steel with reinforced concrete floors and concrete foundations. The plans show terra cotta partitions. The building will be faced with cut stone and brick. The main roof will be used as a promenade. The main entrance is in the centre of the building, and the vestibule leads directly to the main office. To the west of the office is a large drawing room, and off this is a large dining room extending the whole depth of the building. There are also two large rotundas and a cafe on the ground floor. On the first floor there is a large banquet hall and ballroom; there will be about 400 bedrooms. Peter Lyall and Sons, of Montreal, have the contract for the foundations. The contract for the superstructure is not let. Mr. Bosworth, during his trip west investigated the possibility of establishing houses at various points for the company's employes.

Port Moody-North Vancouver.—Press reports state that C.P.R. engineers are making a survey for an extension of the Port Moody line to Seymour Creek and North Vancouver, B.C.

Vancouver Improvements. — George Bury, Vice President and General Manager, arrived in Vancouver Dec. 6, on his first official trip of inspection over the western lines since his recent promotion. He stated that the object of his visit was to obtain all possible information so as to discuss future work of betterments, etc., with the President. The new station would be built on the site of the present station, and he expected that work would be started early in the spring. A portion of the yards at Coquitlam would be completed by the end of this year.

Esquimalt and Nanaimo Ry.—We are officially advised that during 1911 the company laid 26 miles of track on its Alberni extension, viz., from Cameron Lake to Port Alberni. It has under construction a line from McBride Jct. to Union Bay, 34.8 miles, a contract for the clearing of the right of way of which has been let to the Westholme Lumber Co., Victoria, and a branch from Duncan to Cowichan Lake, 16.1 miles, the grading contract for which has been let to Moore and Pethick, Victoria. Negotiations are in progress for securing a right of way for the Westholme branch to Osborne Bay, 3 3 miles.

The formal opening of the line to Alberni was fixed for Dec. 1, but owing to heavy snow storms, the work of finishing up a couple of bridges was delayed, and it was announced that the line would not be opened until Dec. 20. The Inspecting Engineer of the Board of Railway Commissioners made an official trip over it Dec. 7. The service arranged for the winter season is a tri-weekly one.

The Minister of Railways has approved location plans for the extension of the line from Black Creek to Duncan Bay, the construction of which will involve the building of bridges across two considerable rivers. The location plans for 3.25 miles of the line from mileage 47.5 on the main line to Osborne Bay, have been deposited in the Land Registry offices, Victoria, and application is being made to the Board of Railway Commissioners for approval.

Railway Finance, Meetings, Etc.

Acadia Coal Co.—Under the terms of a proposal made in the House of Commons, May 17, 1911, the railway from New Glasgow to Thorburn, U.S., owned by the Acadia Coal Co., and referred to as the Vale Ry., was to have been taken over upon certain terms. The proposal was not adopted. The Minister of Railways stated in the House of Commons, Dec. 7, that the Government did not intend to reintroduce the resolution, and had discontinued the passenger service which was being given under the agreement. (Sept., 1910, pg. 969.)

Alberta Ry. and Irrigation Co.—Notice has been given that the company will, on Jan. 1, pay off its 5% debenture stock outstanding at that date. The transfer books were finally closed Dec. 4.

Algoma Central and Hudson Bay Ry.—There has been listed on the London, Eng., Stock Exchange, an issue of £350,000 of 5% debenture stock.

Brockville, Westport and Northwestern Ry.—The whole of this company's property, including the line from Brockville to Westport, Ont., 45 miles, with the rolling stock and other equipment, etc., was sold under a court order in Toronto, Dec. 11, to R. P. Ormsby, Assistant Secretary, Canadian Northern Ry., for $250,000. Mackenzie, Mann and Co. have for some time held $442,000 of bonds out of a total issue of $450,000, and had a claim of about $50,000 for accrued interest, but they were unable to locate the holder of the other $8,000 of bonds, so that a sale of the property became necessary to give them a title to the property. Mackenzie, Mann and Co. also held over 90% of the common and preferred stock.

Calgary and Edmonton Ry.—A special meeting of the shareholders will be held in Montreal, Jan. 16, to create and issue bonds in respect of the extension of its Lacombe branch 125 miles easterly from the end of the 100 miles in respect of which bonds have already been issued; bridge bonds in respect of the branch line from Strathcona to Edmonton, including the high level bridge over the Saskatchewan River and its approaches; and to approve the form of the respective mortgages to be given to secure payment of same.

Canadian Northern Ontario Ry.—Lazard, Bros. and Co. issued a prospectus in London, Eng., Dec. 7, of £7,000,000 3½% first mortgage debenture stock of the C.N.O.R. Co. unconditionally guaranteed as to principal and interest by the Dominion Government, repayable May 19, 1961. The issue price was 93. It is secured by a first mortgage on about 970 miles of railway now under construction. The proceeds are to be used for the construction of the Montreal-Port Arthur line.

Canadian Northern Pacific Ry.—A prospectus was issued in England recently of £1,438,356 first mortgage 4% guaranteed debenture stock, principal and interest unconditionally guaranteed by the British Columbia Government, and is further secured by a first mortgage on the railway between Vancouver and the British Columbia-Alberta boundary and certain other lines. The issue price was 99.

Canadian Pacific Ry.—Shareholders of record Jan. 2 have the right to subscribe for the $18,000,000 of new capital stock to be issued at $150 on the basis of one new share for every ten held, the right to subscribe expiring Feb. 13. The payment for the stock is to be made:—20% on or before Feb. 13, 20% on April 12, 20% on June 14, 20% on Aug. 16, and 20% on Oct. 18.

Dominion Atlantic Ry.—Estimated gross earnings for Nov., from passengers, $47,800; from freight, $79,700; total, $127,500.

Grand Trunk Ry.—London, Eng., financial papers state that the recent issue of £1,250,000 of 4% guaranteed stock, issued under the power of the G.T.R. Act of 1909, has been over subscribed.

Kaslo and Slocan Ry.—Following are the officers and directors for the current year:—President, J. Anderson; Vice President, H. Giegerich; Manager, J. L. Retallack; Secretary-Treasurer, W. H. Burgess; other director, O. T. Stone. The company has acquired the line from the Great Northern Ry.

Lake Superior Corporation.—Application has been made to the New York State Exchange to list $40,000,000 of the capital stock. The company owns the Algoma Central and Hudson Bay Ry., the Algoma Eastern Ry., the electric railways in Sault Ste. Marie, Ontario and Michigan, and a number of steamboats plying on the Great Lakes, in addition to a number of industrial concerns.

Quebec Central Ry.—Gross earnings for Oct., $120,891.61; expenses, $78,280.07; net earnings, $42,611.54, against $99,773.68 gross earnings; $65,296.41 expenses; $34,477.27 net earnings for Oct., 1910. Aggregate gross earnings for four months ended Oct. 31, 1911, $510,263.07;

expenses, $323,441.27; net earnings; $186,821.80, against $463,867.69 aggregate gross earnings; $294,593.02 expenses; $169,274.67 net earnings for same period 1910.

Quebec Central Ry.—In connection with the application to the Quebec Legislature for the confirmation of the lease of the company's line to the C.P.R., the company desires authority to issue stock bearing interest at 3½% redeemable in 50 years, to replace the existing 8% second debenture stock; to issue 5% debenture stock or bonds repayable in 50 years to take the place of the present 7% income bonds, to permit the changing of the par value of its present shares to £1 or multiples thereof; to change the number of directors and the head office of the company.

St. Lawrence and Adirondack Ry.—A dividend at the rate of 4% was declared Dec. 13. This is the first dividend paid since Dec., 1908. There is $1,615,000 of stock outstanding, all of which is held by the New York Central and Hudson River Rd.

St. Mary's and Western Ontario Ry.—The second mortgage bonds of this company, which is leased to the C.P.R., are held by the municipalities of Embro, East Missouri, and St. Marys, among other holders. The rental paid by the C.P.R. covers the interest of the first mortgage bonds. The C.P.R. holds or controls the capital stock, and has made an offer to retire the second mortgage bonds at 35% of the face value. The St. Marys town council favors accepting the offer and has submitted a by-law to that effect to the taxpayers, but the other two municipalities are not disposed to accept any offer at present.

Temiscouata Ry.—Profit for Oct., 1911. $2,785, against $4,897 for Oct., 1910.

Temiskaming and Northern Ontario Ry.—Revenue for Oct., 1911, $212,-318.83; expenditure, $108,583.65; balance, $103,735.18; ore royalties, $889.87; net revenue, $104,625.05; less hire of equipment, $3,684.60, and outside operations $610; net income, $100,330.45. Total revenue for 12 months ended Oct. 31, $1,780,964.83; expenditure, $1,181,998.63; balance, $598,966.20; ore royalties, $17,060.56; income from hire of equipment, $6,283.93; net revenue, $622,310.69; less hire of equipment, $25,364.64, and outside operations $3,793.69; net income, $593,152.69.

Temiskaming and Northern Ontario Ry.—Sir James Whitney, Premier of Ontario, stated in a speech recently that the G.T.R. is to pay the T. and N.O.R. $300,000 a year for running rights between North Bay and Cochrane, Ont. The G.T.R. will also pay a proportion of the maintenance expenses.

Wabash Rd.—As the result of a friendly suit, F. A. Delaw, President; G. H. Peryor, Vice President, and W. K. Bexley have been appointed by the U.S. court at St. Louis, Mo., receivers for the company, and W. H. Blodgett, the company's general counsel, was appointed solicitor to the receivers. The General Manager is reported as having stated, Dec. 19, that the receivership will in no way affect the operation of the line. The company jointly operates the G.T.R. Southern Division from the St. Clair River to the Niagara River.

The Board of Railway Commissioners has issued an order requiring that all railway companies subject to its jurisdiction file by Jan. 15 copies of all existing contracts with their cartage agents for the cartage of freight at so-called cartage points, with maps showing the cartage limits, and thereafter file from time to time any new contracts or modifications of existing ones, or of cartage limits.

Railway Rolling Stock Notes.

The Minneapolis, St. Paul and Sault Ste. Marie Ry. has ordered 750 box cars.

The St. Lawrence and Adirondack Ry has ordered a mogul locomotive from the Baldwin Locomotive Co., Philadelphia, Pa.

The Duluth, Winnipeg and Pacific Ry. (C.N.R.) has added 10 refrigerator cars and 20 stock cars to its rolling stock. We have already given details of these.

The Canada Iron Corporation, which controls the Northern New Brunswick and Seaboard Ry., has ordered a double ended snow plough from the Canadian Car and Foundry Co., Montreal.

An unconfirmed press report states that the G.T.R. will spend about $500,-000 in improvements in its mechanical department between now and the spring, and that it will build 30 locomotives, mostly in its Montreal shops.

The Canadian Northern Ry., between Nov. 15 and Dec. 15, ordered 250 box cars and 250 steel underframe flat cars from the Canadian Car and Foundry Co., Montreal, and one rotary snow plough from the Montreal Locomotive Works.

Regarding recent reports to the effect that the Central Vermont Ry. is to place gasoline cars on its West River line, we are officialy advised that the matter is under consideration, but is not in a sufficiently advanced state to justify any announcement at present.

The Canadian Northern Ry., between Nov. 15 and Dec. 15, received the following additions to rolling stock: 62 box cars and three sleeping cars from the Canadian Car and Foundry Co., Montreal; 90 box cars from the Crossen Car Co., Cobourg, Ont., and 220 box cars from the Nova Scotia Car Works, Halifax, N.S.

The Intercolonial Ry. has ordered five cabooses to be built at its Moncton shops, and has received five cabooses and 25 platform cars from its Moncton shops; one refrigerator car from the Canadian Car and Foundry Co., five Pacific type locomotives from the Canadian Locomotive Co., and seven box cars, 60,000 lbs. capacity.

The C.P.R., between Nov. 14 and Dec. 14, received the following additions to rolling stock, two double track wooden snow ploughs, six flangers, and two D.10 locomotives from its Angus shops, Montreal; 15 steel single track snow ploughs from the Canadian Car and Foundry Co., Montreal, and one N.3 locomotive from the Canadian Locomotive Co., Kingston, Ont.

The C.P.R., between Nov. 14 and Dec. 14, ordered 2,500 steel frame box cars (mentioned in our last issue), from the Canadian Car and Foundry Co., Montreal; one flanger from its Angus shops, Montreal, and 2,000 steel frame box cars, 90 tank cars and 10 sleeping cars from the United States. Since the last mentioned date it has also ordered 14 steel underframes for Lidgerwood unloaders, from the Canadian Car and Foundry Co., Montreal.

The chief details of the Lidgerwood contractor's flat car which F. H. Hopkins and Co. have ordered from the Canadian Car and Foundry Co., as mentioned in our last issue, are as follows:—

Length over end sills	33 ft.
Width over side sills	9 ft. 8 ins.
Width over flooring	9 ft. 3 ins.
Truck centres	23 ft.
Body bolsters	Simplex
Air brakes	Westinghouse H.C. 812
Couplers	Janney
Truck type	Diamond arch bar, 60,000 lbs. capacity
Truck bolsters and brake beams	Simplex
Brake shoes	Cast iron
Journal boxes	Cast iron
Journal bearings	M.C.B.

Following are chief details of the five Pacific type locomotives, class G2, which the C.P.R. is building at its Angus shops, Montreal, as mentioned in our last issue:

Weight on drivers	142,000 lbs.
Total weight of engine	218,000 lbs.
Weight of loaded tender	140,000 lbs.
Tender capacity, water	5,000 imp. gals.
Tender capacity, coal	12 tons
Heating surface, firebox	175 sq. ft.
Heating surface, tubes	2,730 sq. ft.
Heating surface, total	2,905 sq. ft.
Superheater surface	539 sq. ft.
Total all heating surfaces	3444 sq. ft.
Grate area	45.6 sq. ft.
Cylinders	22½ by 28 ins.
Driving wheels	69 ins.
Brake equipment	Westinghouse E. T. 6.
Lubricator	Detroit No. 22
Valve gear	Walschaert
Boiler pressure	200 lbs.
Superheater	Vaughan and Horsey

Following are chief details of the 2,-500 box cars which the C.P.R. is having built by the Canadian Car and Foundry Co., Montreal, as mentioned in our last issue:—

Length over all	38 ft. 5½ ins.
Truck centres	26 ft. 10 ins.
Extreme width	9 ft. 3½ ins.
Height, top of rail to top of brake wheel	13 ft. 10 ins
Side door openings	5 ft.
Draft springs	M.C.B. Class G
Couplers	Simplex cast steel
Air brakes	Westinghouse K.C. 812
Trucks	C.P.R. standard, 40-ton arch bar with Barber rollers
Wheels	Standard cast iron, 33 ins.
Axles	M.C.B. steel, 5 by 9 ins.
Journal bearings	M.C.B.
Journal boxes	McCord
Truck springs	C.P.R. standard
Brake beams and holsters	Simplex
Side bearings	Susemihl
Journal bearing wedges	M.C.B. drop forged
Brake shoes	Steel back

Following are chief details of the two six wheel switching locomotives, class U3d, which the C.P.R. is building at its Angus shops, Montreal, as mentioned in our last issue:—

Weight in working order	137,000 lbs.
Weight of tender loaded	90 000 lbs.
Weight of tender light	44,000 lbs.
Tender capacity, water	3,500 imp. gals.
Tender capacity, coal	10 tons
Heating surface, firebox	138 sq. ft.
Heating surface, tubes	1,406 sq. ft
Heating surface, total	1,544 sq. ft.
Grate area	29 sq. ft.
Boiler tubes, no. and diar.	234 2 ins.
Firebox	Radial stayed
Boiler, type	Straight top
Boiler pressure	200 lbs.
Driving wheel base	11 ft. 6 ins.
Cylinders, diar. and stroke	18 by 26 ins.
Valves	Piston, 11 ins.
Valve gear	Walschaert
Driving wheels	52 ins.
Axles, driving	8½ by 10 ins.
Axles, tender	5 by 9 ins.
Brake equipment	Westinghouse E.T. 6
Lubricator	Detroit No. 22

Following are chief details of the 25 consolidation locomotives which the Grand Trunk Pacific Ry. has ordered from the Canadian Locomotive Co., Kingston, Ont., for delivery about May, as mentioned in previous issues:—

Weight on drivers	184,800 lbs.
Weight on engine loaded	211,200 lbs.
Weight of tender loaded	150,000 lbs.
Total weight, engine and tender	361,200 lbs.
Wheel base, driving	17 ft.
Wheel base, engine, total	25 ft. 9 ins.
Wheel base, engine and tender	57 ft. 3½ ins.
Heating surface, firebox	168.2 sq. ft.
Heating surface, tubes	2,757.1 sq. ft.
Heating surface, total	2,925.3 sq. ft.
Grate area	50.62 sq. ft.
Cylinders, diar. and stroke	23 by 30 ins.
Boiler, type	Extended wagon top
Boiler, diar. first course	68⅜ ins.
Boiler, dome course	76 ins.
Boiler pressure	180 lbs.
Firebox, wide type	96⅞ by 75½ ins.
Driving wheels, diar.	63 ins.
Tender wheels	34 ins.
Tender, capacity, water	8,000 U.S. gals.
Tender capacity, coal	10 tons
Tractive power	38,541 lbs.
Superheater	Schmidt

The Robb Engineering Co., Amherst, N.S., have been appointed sole Canadian agents for the Parsons turbine built by C. A. Parsons & Co., Newcastle-on-Tyne, Eng., and which is used for driving generators, ventilating fans, etc. In the future the Robb Engineering Co. will manufacture some of the parts.

National Transcontinental Railway Construction, Etc.

We are officially advised that during 1911 track was laid on 280.25 miles, distributed as follows:—New Brunswick, 0.73 mile; Quebec, 155.31 miles; Ontario. 124.21 miles. Following are the chief contractors who are engaged upon the work:—District A, G.T. Pacific Construction Co., Montreal; J. W. McManus Co., Chipman, N.B.; W. Kitchen Co., Grand Falls, N.B.; Lyons and White, Edmundston, N.B. District B—M. P. and J. T. Davis, Quebec; Macdonnell and O'Brien, Montreal; G.T. Pacific Construction Co. District C—Macdonnell and O'Brien; G.T. Pacific Construction Co. District D—G.T. Pacific Construction Co.; E. F. and G. E. Fauquier, Ottawa; M. P. and J. T. Davis. District E—M. P. and J. T. Davis; E. F. and G. E. Fauquier; O'Brien, Fowler and MacDougall Bros., Dryden, Ont. District F—O'Brien, Fowler and MacDougall Bros.; J. D. McArthur, Winnipeg.

New Brunswick papers give details of a trip made over the line from Edmundston to Moncton, by a contractor's train Nov. 30. It is stated that the track was in excellent condition, and that, with the exception of stations and terminals. the line was complete.

The Minister of Railways stated in the House of Common, Dec. 4, that the commissioners reported as follows:—"The engineers advise that the portion of the line in New Brunswick will be completed by Sept., 1912, and the portion in Quebec from the New Brunswick boundary to the St. Lawrence river will be completed by Sept. 30, 1913."

The Minister stated that the Government had not considered whether it would undertake the operation of the Moncton-Quebec section until the Quebec Bridge is completed.

The House of Commons has directed that a return be brought down giving "copies of all papers, correspondence and orders-in-council in connection with the awarding of the contract for the building of the N.T.R. station at Quebec, and all orders suspending work on the same. A press report states that the Government has under consideration the desirability of abandoning the Champlain market as the site of the station.

The Minister of Railways stated in the House of Commons, Nov. 29, that the question of building a line from the N.T.R. into Montreal to the exclusion of the G.T. Pacific Ry., had not been under consideration by the Government. He also stated that a subsidy had been applied for to aid in the building of the line. Such a subsidy was available, having been voted in 1908, but it had not been promised to the G.T. Pacific Ry. or to any other company.

The Commissioners will receive to Jan. 10 tenders for the supply of 14,468 gross tons of 80-lb. steel rails, and the necessary rail fastenings, and to Jan. 3 for the pipe covering required for the equipment of the locomotive shops at Transcona, Man.

The lift span of the bridge over the Red River, at the foot of Lombard St., Winnipeg, is reported to have been completed. The necessary connections with the line at both ends have yet to be made. (Dec., 1911, pg. 1153.)

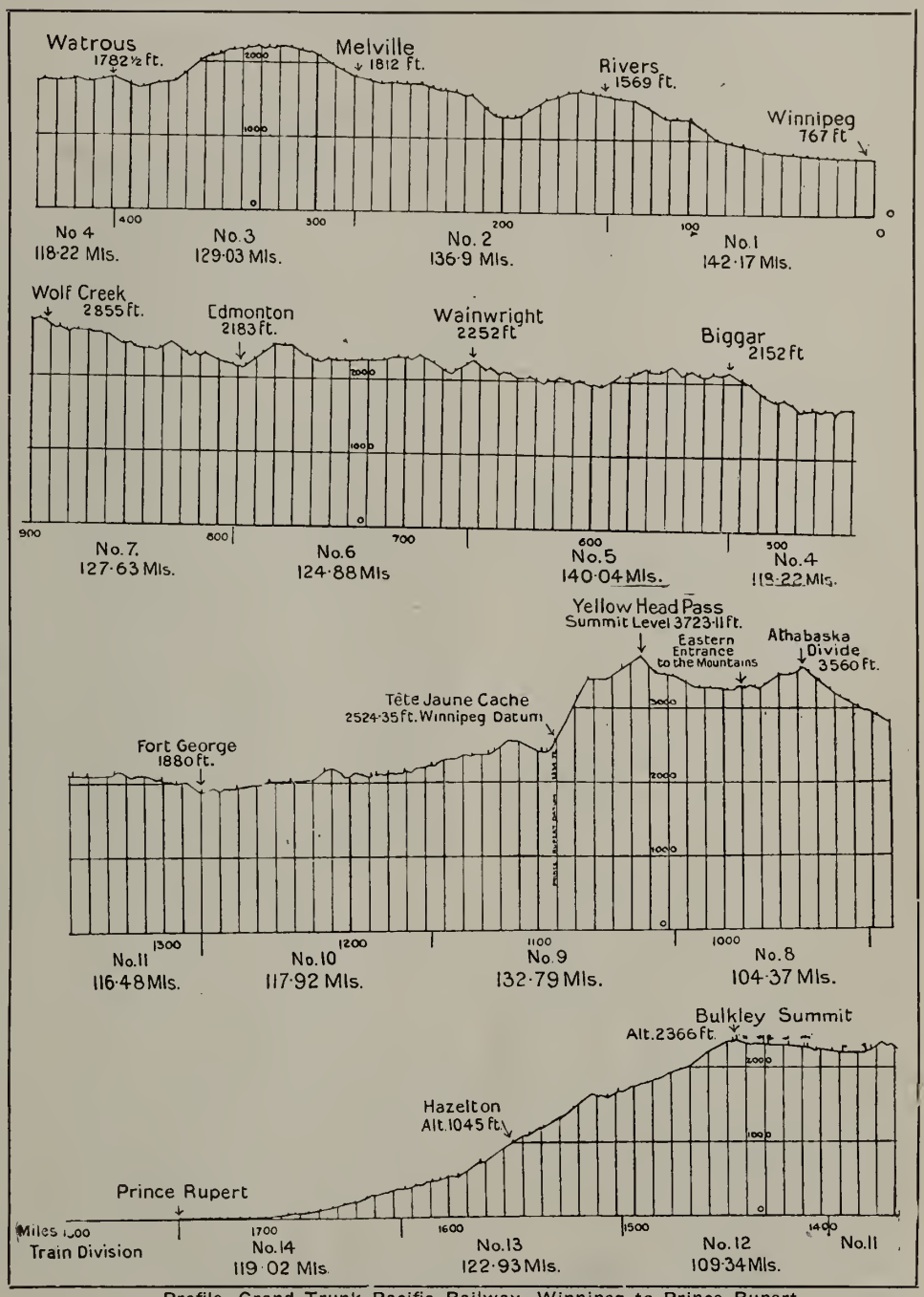
Grand Trunk Pacific Railway Construction, Etc.

The Dominion Parliament passed through all their stages, Dec. 5, acts extending the time for the construction of the National Transcontinental Railway, Western Division, the building of which, according to the agreement with the G.T. Pacific Ry., was to have been completed Dec. 1, 1911. The time extension is for one year for the Prairie section and three years for the Mountain section. The act respecting the G.T.P.R. declares that the company has and shall continue to have all the powers originally conferred upon it as regards the uncompleted portions of the line, which are to be completed within such time as may hereafter be fixed by an order-in-council in accordance with the act granting an extension of time for the construction of the National Transcontinental Railway, passed on the same day—Dec. 5.

During 1911 the company laid 254 miles of new track, of which 99 miles were on the main line, from Pedley, Alta., to 25 miles west of Yellowhead Pass, B.C., and 155 miles on four branch lines as follows:—Melville-Regina branch—Balcarres to Regina, Sask., 61 miles; Prince Albert branch—Measham to Wakaw, Sask., 42 miles; Calgary branch—Red Deer River southerly for 22 miles: Coal branch—Bickerdike, Alta., for 30 miles southerly.

The work at present under construction and under contract on the main line covers from mileage 55 to 50 west of Yellowhead Pass, 25 miles; from Tete Jaune Cache to Aldermere, B.C., 425 miles, and from mileage 100 to 235 east of Prince Rupert, 135 miles. These mileages cover the remaining portions of the main line upon which track had not been laid to Dec. 31, 1911. The contracts for this work, three in number, are being carried out by Foley Bros., Welch and Stewart.

Construction was in progress on the following branch lines Dec. 31:—Harte-Brandon branch—from Harte, southwesterly for 25 miles; Regina-Boundary branch—from Regina for 136 miles southeasterly; Regina-Moose Jaw branch—from Regina to Moose Jaw, 40 miles; Moose Jaw northwesterly—from Moose Jaw northwesterly for 42 miles. Prince Albert branch—from Wakaw to Prince Albert, 45 miles; Battleford branch from Biggar to Battleford, 48 miles; Cutknife branch—from Battleford westerly, 32 miles; Biggar-Calgary branch—from Biggar westerly, 104 miles; Calgary branch—from Perbeck to Calgary, 95 miles; Alberta Coal branch —from mileage 30 to mileage 56 south



Profile, Grand Trunk Pacific Railway, Winnipeg to Prince Rupert.

of Bickerdike, 26 miles. The several contractors on these branch lines are:—J. D. McArthur Co., Winnipeg; Rigby, Hyland and Plummer, Winnipeg; Phelan and Shirley, Bickerdike, Alta; J. Dandelin, Battleford, Sask.; Lamereaux and Petersen, Omaha, Neb.; John Gunn and Sons, Winnipeg; Duncan McArthur, Winnipeg.

The following extensions on branch lines were under survey Dec. 31:—Cutknife branch—from mileage 32 west of Battleford to Wainwright, 100 miles; Biggar-Calgary branch—from mileage 104 to 224, west of Biggar; Edson, northerly for 60 miles Mountain Park Coal branch—from mileage 36 south of Bickerdike for 32 miles; Regina boundary branch—from mileage 130 to 155.

We are advised that a contract has been let to the John S. Metcalf Co., Montreal and Chicago, Ill., for the draining and building of a 2,500,000 bush. concrete storage elevator at the Mission Island terminal, Fort William, Ont. The estimated cost of the building is $500,000. This is the second storage unit of the G.T.P.R. elevator there and will bring the storage capacity of the elevator to a total of 5,750,000 bush. The ultimate plans of the grain handling facilities at this point as designed contemplate a total storage capacity of 40,000,000 bush.

The G.T. Pacific Branch Lines Co. is applying to the Saskatchewan Legislature to validate an agreement entered into with the city of Regina, Nov. 30, 1911.

Prince Rupert Terminals.—The company's plans for Prince Rupert, B.C., include a 20,000-ton floating dry dock, shore plant comprising a 1,200-kw. generating station, air compressors, machine shop, blacksmith and boiler shops, and a covered shipbuilding platform. (Dec., 1911, pg. 1153.)

Equipment of Snow Ploughs.

The Board of Railway Commissioners has notified railway companies under its jurisdiction to show cause at the sittings in Ottawa on Feb. 7, why they should not be directed to equip snow ploughs, in which men are required to ride for the purpose of operating the ploughs, as follows:—

Direct connection between the plough and the steam whistle of the locomotive, so that the man in charge of he plough can give proper whistle signals for railway crossings, stations, etc.

To equip each plough with air gauge and air controlling valve, also proper air connections between plough and locomotive, to enable man in charge to control the air brake, which he can apply in all cases of emergency.

That snow ploughs that are run as push ploughs, not fitted with cupolas, and having no men in charge, shall be fitted with air pipe connections between plough and locomotive, so that in case of accident, where plough is derailed and air connections broken, air will immediately apply automatically.

That all snow ploughs be equipped with automatic couplers.

British Columbia Railway Plans.—In a speech at Vancouver, Dec. 14, Premier McBride stated that the Government was considering a policy for the development of railways within the province, which would be laid before the Legislature soon after its opening. One of the subjects under consideration was the line through the centre of the province from Vancouver to Fort George.

Jas. Forrest, who has charge of the Toronto Ry. Co.'s accident department, has nearly recovered from his serious accident, and was able to get out on Dec. 25, when a serious accident occurred near the King St. sheds.

Canadian Northern Railway Construction, Betterments, Etc.

New Brunswick—Press reports state that Sir Wm. Mackenzie and associates have secured control of 192 square miles in the oil bearing shale districts of New Brunswick. Sir William and G. G. Ruel, of the Canadian Northern Ry. legal department, met the New Brunswick Government, Dec. 1, and are reported to have discussed the development of the property. The question of railway accommodation in these oil fields is stated to be under consideration.

Canadian Northern Quebec Ry.—A press report states that surveys are being made for a line from St. Eustache to St. Jerome, Que., 16 miles, and from St. Justin to St. Stanislas, 60 miles.

Sir Wm. Mackenzie, President, C.N.R., was in Montreal, Dec. 12, and in an interview is reported to have said he would make no announcement regarding the proposed terminals there until his return from Europe. The company's representatives were at work on the details of the proposals.

Canadian Northern Ontario Ry.—The line under construction from Hawkesbury, Ont., to Montreal will run through the southern part of Two Mountains county, which is now without railway accommodation. The engineers in charge of construction opened an office in St. Eustache, Dec. 1, and work is being gone on with in that vicinity. The right of way has been cleared up to the river, and work has been started on the bridge to connect with St. Jesus. A second bridge will carry the line on to Montreal Island. It is stated that a connection will be made with the G.T.R.-Jacques Cartier line, so as to run trains into Bonaventure station, pending the building of the company's own terminals in Montreal. It is reported that considerably more than half the grading has been completed between St. Eustache and Hawkesbury, and it is expected to have the line completed by the end of the year. A new line from Hawkesbury into Montreal was put in operation early in 1911.

Westward from Ottawa, contracts have been let to J. P. Mullarkey for building the line from Ottawa to Pembroke, 90 miles, and to Angus Sinclair, C.E., for building the line from Pembroke to Capreol tp., 220 miles. This will carry the line to a connection with the Toronto-Sudbury line, and its extension, which will form part of the transcontinental line.

From the end of the present constructed line near Gowganda Jct., the line is under contract to Port Arthur. Steel is reported to have been laid to 61 miles beyond Sudbury Jct. Plans and books of reference for the route between mileage 68.7 and 76.5; between mileage 79 and 80.8, and between mileage 182.03 and 183.78 have been filed in the registry office at Sault Ste. Marie, Ont. The Board of Railway Commissioners has approved of revised location plans for the line in Nipigon tp., mileage 68.58 to 69.53; from mileage 194.52 to 203.24, and from mileage 534.72 to 535.01 (Pearl station) from Sudbury Jct.; and from mileage 48.8 to 50.5 from Port Arthur, in Dorion tp.

The Board of Railway Commissioners has approved of revised location plans for the Toronto-Ottawa line, in the vicinity of Stonehouse Lake, Storrington tp., mileage 174.67 to 175.35 from Toronto.

The plans for the company's lines in the northwest part of Toronto and out through Lambton have been before the Board of Railway Commissioners. Orders were made as to the provision of subways, and it is said that a new route alongside the C.P.R. will be utilized through Lambton. The company, through a subsidiary—the Toronto, Niagara and Western Ry. Co.—is reported to be buying right of way in and through Hamilton. Press reports state that the surveys for the westerly extension of the line are being made from Hamilton via Brantford, and London to Sarnia, Ont.

Canadian Northern Ry.—A new coal dock is under construction at Port Arthur, Ont., for the Canadian Northern Coal Dock Co., at a reported cost of $400,000. The new plant, which will have a capacity of 60,000 tons of hard coal and 250,000 tons of soft coal, will have a frontage of 600 ft. at the head of the docks. The contract was said to have been let to the Barnett-McQueen Co., Dec. 7.

An extension of the Thunder Hill branch to Princeville, Sask., 74 miles, has been opened for traffic. The Board of Railway Commissioners has authorized the opening for traffic of the Maryfield extension from Radville to Bengough, Sask., of 45 miles, and the extension of the branch to Calgary from Warden, mileage 109.5, to Drumeller, mileage 172.63, Alta.

It is reported that some 400 miles of grading was completed in Alberta during 1911. The principal part of the construction has been in the Edmonton district. It was expected to complete by Dec. 31 the line to Athabasca Landing, of which 56 miles was built during the year. The other work done includes 166 miles of grading towards the Yellow-Head Pass; 20 miles of grading on a line in the direction of the Peace River; over 100 miles of grading has been done on the line from Stettler via Red Deer to the Saskatchewan River and over 50 miles between the river and Rocky Mountain House; the line to Calgary has been put in operation as far as Drumeller, while the grading has been pushed for some miles further, and considerable grading has been done on the line between Strathcona and Camrose.

The town of Macleod is applying to the Alberta Legislature for the validation of a bylaw closing certain streets, avenues and lanes crossing the C.N.R. right of way, station grounds and yards, conveying certain lands to the company, and an agreement made in respect to the building of the line in the town.

Canadian Northern Pacific Ry.—M. H. McLeod, General Manager and Chief Engineer, C.N.R., was in Vancouver, B.C., Dec. 6. He is reported to have stated that it was proposed that the company's engineers would resume location survey work in the spring in the direction of the Pine River Pass. A route map had already been filed at Ottawa, and the line through northern British Columbia would be built under one of the C.N.R. subsidiary companies' charters. While Stewart, on the Portland Canal, had been spoken of as the probable terminus, nothing had been determined. In connection with the statement it may be mentioned that the Canadian North Eastern Ry. has been built inland from Stewart to Bear River, and C. Hoard, with an engineering party, returned to Victoria at the end of Nov. from a surveying trip along the Naas Valley to Hazleton, B.C.

While on the Pacific Coast, Mr. McLeod made an inspection of the work going on at Port Mann, and also of probable routes between that place and Vancouver. Track has been laid on the line from Port Mann, easterly to Chilliwack, 46 miles, and work will be continued all winter on sections of the line between that point and the eastern boundary of the province, to which point the line is being built from Edmonton, Alta. The working force was increased during Dec., and it is expected it will be still further added to during the winter, as Mr. McLeod stated that it

was the company's desire to have the line completed through by the end of 1913.

We are officially advised that a contract has been arranged with J. A. L. Waddell, Kansas City, Mo., for plans for two bridges across the Fraser River, and four across the Thompson River, and for supervising the erection of the same. Nothing has as yet been decided as to the design of these bridges.

Vancouver Island.—We are officially advised that the contract for the building of the line on Vancouver Island from mileage 60 to 100 has been let to Moore and Pethick, Victoria, B.C. This section will carry the line to the summit just beyond the upper end of Cowichan Lake. The construction is rather heavy, as it is to be built to a maximum gradient of 0.4%. No track has yet been laid on the line out of Victoria. The survey and construction work is now entirely in charge of D. O. Lewis, as District Engineer, G. B. Hughes, heretofore engineer of surveys, having resigned to enter the British Columbia Electric Ry. Co.'s service. (Dec., 1911, pg. 1145.)

Alberta Legislation for Railway Construction.

The Premier informed the Alberta Legislature Dec. 7, that the Government would submit, during the session, a proposition providing for the construction, extending over some years, of the following lines of railway: (1) From Edmonton to Grand Prairie. (2) From Athabasca Landing to Peace River Landing. (3) From Athabasca Landing to the vicinity of Fort McMurray, with a branch line to Lac la Biche. (4) From Edmonton along the north shore of the Saskatchewan River to the eastern boundary of the province near Cold Lake. (5) From Bruderheim, running east and north of the Canadian Northern Ry. main line, to range 5, and then to the southern boundary of the province between ranges 5 and 6. (6) A continuation of the Peace River line, and the line already arranged for between Camrose and Strathcona down to the eastern boundary of the province to meet the line coming up from Winnipeg and Regina, Sask. (7) A line from Strathcona, south of the Saskatchewan River to about 18 miles west of the Calgary and Edmonton Ry., thence south to the neighborhood of Pincher Creek, at an average distance of three townships west of the C. and E. Ry. (8) A line from the Stettler-Brazeau line starting about 18 miles east of the Calgary and Edmonton Ry. and running south to meet the Canadian Northern Ry. line through the Goose Lake district into Calgary, near Swallowvale, north of the C.P.R.

A bill was submitted to the Legislature on the same day, authorizing the borrowing of $5,000,000, of which $4,000,000 would be devoted to the extension of railways.

Replying to questions, the Premier said the lines to be aided would be built by the Canadian Northern Ry. and the G.T. Pacific Branch Lines Co. The province had already guaranteed the C.N.R. bonds in respect of 470 miles of line, of which 447 miles had been graded, and on which 284 miles of track had been laid. Passenger and freight services were being operated over 207 miles of the lines so built. The province had paid to the company $4,073,984 of the proceeds of the guaranteed bonds. The province had guaranteed the G.T. Pacific Branch Lines Co.'s bonds for building 193 miles of line. This mileage had been graded, 104 miles of track had been laid, and trains were being operated over 70 miles. The province had paid out $1,614,659.80 of the proceeds of the guaranteed bonds.

TRANSPORTATION APPOINTMENTS.

The information under this head, which is almost entirely gathered from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who may notice any error in our announcements will confer a favor by advising us.

Algoma Central and Hudson Bay Ry.—A. H. Chitty, heretofore Assistant Treasurer, has been appointed Treasurer. Office, Sault Ste. Marie, Ont.

Canada and Gulf Terminal Ry.—Rene Dupont, heretofore Secretary-Treasurer, has been appointed Traffic Manager.

F. W. Rous has been appointed Secretary-Treasurer, vice Rene Dupont. Office, Montreal.

Canadian Northern Pacific Ry.—D. O. Lewis, heretofore Engineer of Construction for lines on Vancouver Island, has also been appointed Engineer of Surveys, vice G. B. Hughes, resigned to enter the B.C. Electric Ry. Co.'s service. Office, Victoria, B.C.

Canadian Government Railways.—An unconfirmed press report of Dec. 21 stated that the Minister of Railways was looking for an expert railway man and engineer as deputy head for the Railway and Canal Department, and that the position had been offered to F. P. Gutelius, M. Can. Soc. C.E., General Superintendent, C.P.R. Eastern Division. The same report stated that the present Deputy Minister, A. W. Campbell, M. Can. Soc. C.E., would be placed in charge of a branch to administer the "good roads" work proposed to be taken up by the Government.

Canadian Northern Quebec Ry.—Quebec and Lake St. John Ry.—J. S. Jackson, heretofore in Canadian Car and Foundry Co.'s service, has been appointed General Car Foreman, C.N.Q.R. and Q. and L. St. J.R. Office, Joliette, Que.

Canadian Northern Ry.—The appointments of J. R. Cameron as Assistant General Manager, and A. E. Warren and A. Wilcox as General Superintendents, were announced in our last issue. The following additional information in regard to them has been received since:

J. R. Cameron, heretofore General Superintendent all lines, has been appointed Assistant General Manager, with jurisdiction over matters pertaining to operation and maintenance. Office, Winnipeg.

A. E. Warren, heretofore Superintendent, District 2, Winnipeg, has been appointed General Superintendent, Central Division, consisting of line Port Arthur to Regina and to Dauphin, not including the two last mentioned terminals. Office, Winnipeg.

A. Wilcox, heretofore Assistant General Superintendent, Winnipeg, has been appointed General Superintendent, Western Division, consisting of lines north of Regina and west of Dauphin, including those terminals. Office, Edmonton, Alta.

J. M. Grieve has been appointed Chief Inspector, Sleeping, Dining and Parlor Cars. Office, Winnipeg.

D. Robinson has been appointed Inspector, Sleeping, Dining and Parlor Cars. Office, Winnipeg.

S. C. Felgate has been appointed agent, Sleeping, Dining and Parlor Cars, with jurisdiction over Edmonton and Prince Albert, and all employes stationed at, or running in and out of Saskatoon. Office, Saskatoon, Sask.

J. R. Miller, heretofore machinist, Winnipeg shops, has been appointed Locomotive Foreman, Radville, Sask.

W. A. Cowan, formerly Resident Engineer at Farnham, Que., has been appointed one of the assistant engineers in the Assistant Chief Engineer's office, Montreal, and not Inspecting Engineer, as stated in our last issue.

Canadian Pacific Ry.—F. W. Cooper, heretofore Resident Engineer, London, Ont., has been appointed Resident Engineer, District 2, Eastern Division, including Montreal terminals. Office, Montreal.

F. J. Mahon, heretofore Superintendent of Telegraphs, Atlantic Division, St. John, N.B., has been appointed Superintendent of Telegraphs, Eastern Division, vice J. F. Richardson, transferred. Office, Montreal.

J. Fletcher, heretofore Superintendent of Telegraphs, British Columbia Division, Vancouver, is reported to have been appointed Superintendent of Telegraph Traffic, Montreal.

F. B. Tapley, heretofore Resident Engineer, Brownville Jct., Me., has been appointed Resident Engineer, District 2, Ontario Division, London, vice F. W. Cooper, transferred to Eastern Division.

H. R. Miles, Resident Engineer, North Bay, Ont., has had his territory extended to include that hitherto in charge of H. T. Ruhl, recently transferred from Sudbury, Ont., to Farnham, Que., as announced in our last issue.

C. Erickson has been appointed acting Roadmaster, White River Subdivision, Lake Superior Division, White River, vice T. Lannin, assigned to other duties.

T. Allison has been appointed Sleeping and Dining Car Agent, North Bay, Ont., vice W. Morrison, transferred.

W. Morrison, heretofore Sleeping and Dining Car Agent, North Bay, Ont., has been appointed Sleeping and Dining Car Agent, Fort William, Ont., vice C. Mead, promoted.

J. T. Tait, heretofore Superintendent of Telegraphs, Manitoba Division, Winnipeg, has been appointed Assistant to General Superintendent of Telegraphs, Western Lines. Office, Winnipeg.

J. McMillan, heretofore Superintendent of Telegraphs, Alberta Division, Calgary, has been appointed Superintendent of Telegraphs, Manitoba Division, vice J. T. Tait, promoted. Office, Winnipeg.

G. S. Morris, heretofore first trick dispatcher, main line, Brandon, Man., has been appointed Chief Dispatcher there, vice J. K. Savage, appointed Superintendent, District 2, Saskatchewan Division.

N. Fletcher, heretofore in the Superintendent's office, Brandon, Man., has been appointed Accountant, Districts 3 and 4, Manitoba Division, vice H. H. Godard, transferred to Revelstoke, B.C.

E. Ashworth has been appointed Storekeeper at Minnedosa, Man. This is a new position.

The Saskatchewan Division is now being operated in three divisions. Following are details of the territory covered by each, and list of staff of the new district 2:—District 1—Moose Jaw to Swift Current, Outlook subdivision, and Portal subdivision, not including Weyburn. Superintendent, E. W. DuVal. Office, Moose Jaw. District 2—Broadview to Moose Jaw, not including either place, Moose Mountain subdivision (not including Arcola), Weyburn, Forward, and Colonsay subdivisions (not including Colonsay), and Bulyea subdivision (not including Bulyea). Superintendent, J. K. Savage, heretofore Chief Dispatcher, Brandon, Man.; chief clerk, G. G. Hamilton, heretofore in General Superintendent's office, Moose Jaw; Trainmaster, W. R. Boucher, heretofore Trainmaster, Moose Jaw; Chief Dispatcher, G. T. Coleman, heretofore Assistant Chief Dispatcher, Moose Jaw; District Master Mechanic, W. Webb, heretofore locomotive engineer, Brandon, Man.; Roadmasters, J. Hollonquist, heretofore Roadmaster at Moose Jaw; G. Sandstrom, heretofore Roadmaster at Strassburg; L. Rinstad and T. Roulston; Locomotive Foreman, A. S. McDonald. The offices of all those mentioned, except T. Roulston, who is located at Weyburn, are at Regina. District 3—Wynyard subdivision (not including Bredenbury).

Last Mountain subdivision (not including Neudorf and Lanigan), Saskatoon, Battle River and Kerrobert subdivisions. Superintendent, H. H. Boyd. Office, Saskatoon.

C. H. Zerbach has been appointed Car Foreman. Moose Jaw, Sask., vice A. Cameron, resigned.

V. B. Beardmore has been appointed Storekeeper, Swift Current, Sask., vice W. McGimpsey, resigned.

T. B. MacSwain has been appointed Storekeeper, Kamloops, B.C., vice G. Fitzpatrick, transferred to Sutherland, Sask.

G. Fitzpatrick, heretofore Storekeeper, Kamloops, B.C., has been appointed Storekeeper, Sutherland, Sask., vice G. Burke, resigned.

R. H. Brown has been appointed Night Foreman at Sutherland, Sask., vice J. H. Kepple, who has returned to the Sutherland shops as machinist.

D. Coons, heretofore Inspector of Telegraphs, Manitoba Division, Winnipeg, has been appointed Superintendent of Telegraphs. Alberta Division, vice J. McMillan, transferred to Winnipeg. Office, Calgary.

C. Mead. heretofore Sleeping and Dining Car Agent, Fort William, Ont., has been appointed Assistant Superintendent, same department, vice A. J. Macdonnell. Office, Calgary, Alta.

M. Newlands, heretofore Roadmaster, Red Deer subdivision, Alberta Division, has been appointed Roadmaster, District 3, Alberta Division, vice J. Todd, transferred.

T. Riordan has been appointed Roadmaster, Red Deer subdivision, Alberta Division, vice M. Newlands, transferred.

J. Todd, heretofore Roadmaster, District 3, Alberta Division, has been appointed Roadmaster, Edmonton section, Alberta Division.

T. Bradshaw has been appointed Roadmaster, Calgary Terminals.

D. McTaggart has been appointed Bridge and Building Inspector, Calgary, Alta., vice W. McKinty, transferred.

W. J. Shepherd has been appointed Car Foreman at Revelstoke, B.C., vice G. Donley, transferred.

C. E. Lundell has been appointed Assistant Car Foreman at Revelstoke, B.C., vice J. W. Chesterman, transferred.

F. X. LaPrairie, heretofore Assistant and Wrecking Foreman, Vancouver, B.C., has been appointed Car and Wrecking Foreman at North Bend, B.C. This is a new position.

J. F. Richardson, heretofore Superintendent of Telegraphs, Eastern Division, Montreal, has been appointed Superintendent of Telegraphs, British Columbia Division, vice J. Fletcher, transferred. Office, Vancouver.

Duluth, Rainy Lake and Winnipeg Ry.—C. W. Houston, heretofore Chief Dispatcher at Virginia, Minn., has been appointed Superintendent, vice M. B. Murphy, appointed Superintendent, District 2, C.N.R., Winnipeg, as announced in our last issue. Office, Virginia, Minn.

Duluth, South Shore and Atlantic Ry., Mineral Range Rd.—A. B. Eldredge, heretofore Vice President and General Attorney, has been elected President, vice W. F. Fitch, President and General Manager, resigned. Office, Marquette, Mich.

W. W. Walker, heretofore General Freight Agent, has been appointed Vice President and General Manager, vice A. B. Eldredge, Vice President, elected President. He will have charge of all matters pertaining to operation and traffic. Office, Duluth, Minn. He has also been elected a director, in place of W. R. Baker, Assistant to the President, and Secretary, C.P.R., resigned.

S. R. Lewis, heretofore Assistant General Freight Agent, has been appointed General Freight Agent, vice W. W. Walker, promoted. Office, Duluth, Minn.

W. D. Johnson, heretofore General Roadmaster, has been appointed Assistant Superintendent, vice A. M. Sutherland, resigned. Office, Thormaston, Mich.

Grand Trunk Pacific Ry.—R. Gardiner, heretofore Locomotive Foreman, Melville, Sask., has been appointed Locomotive Foreman, Transcona, Man., vice A. C. Loudon, resigned on account of ill health.

W. Molson MacPherson, Quebec, President, Molson's Bank, has been elected a director G.T.P.R., in place of Hugh A. Allan, resigned, owing to his now residing in England.

W. Moher, heretofore locomotive driver, has been appointed Road Foreman of Locomotives, Districts 1, 2 and 3 and Melville branches, vice A. McTavish, assigned to other duties.

The following agents have been appointed:—Cabot, Man., A. J. Cushing; Goodeve, Sask., H. A. Phillips; Landis, Sask., R. E. Patterson; Edgerton, Alta., D. M. Davis; Stony Plain, Alta., C. Reagh; Fort Qu'Appelle, Sask., C. W. Kemp.

Grand Trunk Pacific Ry., Grand Trunk Pacific Coast Steamship Co., Grand Trunk Ry.—A. E. McMaster, heretofore Agent, has been appointed General Agent in charge of Passenger and Freight Traffic in western British Columbia, north of Rivers Inlet, including Queen Charlotte Islands. Office, Prince Rupert.

Grand Trunk Ry.—James Edward, heretofore Travelling Freight Agent, Moncton, N.B., has been appointed Commercial Agent, there.

W. R. Germain has been appointed acting station master, Bonaventure station, Montreal, vice P. C. Caron, deceased.

J. D. Scott has been appointed Locomotive Foreman at Turcot, Montreal, vice H. Powers. assigned to other duties.

W. J. Nixon, Trainmaster, District 5, Eastern Division, has had his office moved from Montreal to Brockville, Ont., and his jurisdiction extended to the west semaphore at Brockville.

C. S. Cunningham, heretofore acting Superintendent, Western Division, has been appointed Superintendent. Office, Detroit, Mich.

J. C. Talmage, heretofore Travelling Car Service Agent, Detroit, Mich., has been appointed Trainmaster, Districts 25, 27 and 28, vice F. G. Bement, resigned. Office, Durand, Mich.

The following agents have been appointed:—Oshawa Jct., Ont., H. Barker; Kirkfield, Ont., R. G. Winters; Wyebridge, Ont., J. Mitchell; Sebringville, Ont., W. E. Cusson; Fergus, Ont., C. E. Fleming; Ottawa, Ont., R. O. Kenney. The station at Nipissing Jct. and the outside agency at Valleyfield, Ont., have been closed.

Intercolonial Ry.—W. A. Dube, Superintendent at Levis, Que., has been suspended by the Minister of Railways, pending an investigation into charges of partizanship, etc., that have been made against him. Emile Gelly, advocate, Quebec, who has been appointed to investigate charges of partizanship against Government officials in the province of Quebec, will hear the charges against Mr. Dube.

Jas. A. McDonald, of Halifax, N.S., and E. T. C. Knowles, of St. John, N.B., have been appointed to investigate charges against officials in Nova Scotia and New Brunswick respectively

Press reports of Dec. 7 stated that J. A. Humble had been appointed Claims Agent, vice J. S. Leighton, but we were officially advised, Dec. 21, that no appointment had then been made.

A press report states that the tracer of lost cars has been suspended pending an enquiry.

Lehigh Valley Rd.—W. J. Hamilton, heretofore City Passenger and Ticket Agent, Niagara Falls, N.Y., has been appointed Canadian Passenger Agent, vice R. S. Lewis, deceased. Office, 8 King St. East, Toronto.

W. B. Prescott has been appointed City Passenger and Ticket Agent, Niagara Falls, N.Y., vice W. J. Hamilton, promoted.

Michigan Central Rd.—R. A. Barrett having been appointed Trainmaster, T., H. and B. Ry., Hamilton, Ont., the position of Assistant Trainmaster, M.C.R., St. Thomas. Ont., has been abolished.

Midland Ry. of Manitoba.—C. E. Defoe, Trainmaster, Northern Pacific Ry., Livingston, Mont., has been appointed Terminal Superintendent, M.R. of M. at Winnipeg. The appointment will go into effect when the G.N.R. service to Winnipeg over the M.R. of M. is put into force.

National Transcontinental Ry.—Duncan MacPherson, M. Can. Soc. C.E., heretofore Assistant Chief Engineer, has been appointed Assistant to the Chairman. Office, Ottawa. We were officially advised Dec. 20 that no appointment had then been made to succeed Mr. MacPherson as Assistant Chief Engineer.

Pere Marquette Rd.—W. L. Kellog, heretofore Superintendent of Motive Power, Cincinnati, Hamilton and Dayton Ry., has been appointed Superintendent of Motive Power, P.M. Rd. Office, Detroit, Mich.

The line has been divided into five divisions, as follows:—Grand Rapids Division, F. Hartenstein, Superintendent, Grand Rapids, Mich.; Saginaw Division, A. R. Merrick, Superintendent, Saginaw, Mich.; Buffalo Division, W. K. Tasker, Superintendent Port Huron, Mich.; Ionia Division, J. E. Church, Superintendent, Ionia, Mich.; Petoskey Division, W. H. Romoser, Superintendent, Traverse City, Mich.

The Buffalo Division comprises the lines Port Huron to Grindstone City, Palms to Port Hope, Poland to Sandusky, Port Huron to Hoyt, Bad Axe station and yard, Port Huron to Almont, and the ferry service at Port Huron, also the lines in Canada, namely:—Sarnia to Rondeau, Windsor to Walkerville Jct., Walkerville to St. Thomas, London to Port Stanley.

W. Madden. heretofore Division Engineer, Detroit, Mich., has been appointed Division Engineer, Buffalo Division. Office, Port Huron, Mich.

C. F. Weir, heretofore Supervisor of Bridges, St. Thomas, Ont., has been appointed Foreman of Bridges and Buildings, Buffalo Division. Office, Port Huron, Mich.

W. E. Shaffer has been appointed Foreman of Water Service, Buffalo Division. Office, Port Huron, Mich.

E. S. Stuart has been appointed Trainmaster, and F. P. Little, Chief Train Dispatcher, with jurisdiction over the portion of the Buffalo Division west of the Detroit and St. Clair Rivers.

R. M. Johnson has been appointed Trainmaster with charge of line between Grand Rapids and Detroit, including Detroit terminals. Office, Detroit.

Reid Newfoundland Co.—A. Rowsell has been appointed Roadmaster, Bonavista branch.

Toronto, Hamilton and Buffalo Ry.—R. A. Barrett. heretofore Assistant Trainmaster, Michigan Central Rd., St. Thomas, Ont., has been appointed Trainmaster, T., H. and B.R., Hamilton, Ont., vice G. M. Higgerson, heretofore Trainmaster and Chief Dispatcher, who retains the latter position.

White Pass and Yukon Route.—O. L. Dickeson, Vice President and General Manager, left Vancouver, B.C., Dec. 9, for England, and press reports state that he will succeed the late S. H. Graves as President.

Steam Railway Track Laid in 1911.

In response to our request for information of the new track laid during 1911, we have received replies from nearly every railway which has been doing any building during the year, the most important line from which there is no reply being the Canadian Northern Ry., although we have replies from the Canadian Northern Ontario Ry. The table which follows is compiled from the information received. Where the name of a line is preceeded by an asterisk the figures are estimated either by the company's staff prior to work being finished for the year, or in our office. It will be noticed that outside of the Canadian Northern, Canadian Pacific, Grand Trunk Pacific and National Transcontinental Railways about 250 miles were built by 14 different companies. From the figures at present available, and which are subject to revision, it would appear that a total of about 1,830 miles of new track were laid in 1911. The figures we published in March last showed the actual mileage laid in 1910 as 1,870.44.

	Miles.	Miles.
*ALGOMA CENTRAL AND HUDSON BAY RY.—		
Extensions Ont. ...	...	50.00
ALGOMA EASTERN RY.—		
Espanola to Spanish River, Ont...	4.60	...
Espanola southerly, Ont.	1.50	
		6.10
ATLANTIC, QUEBEC AND WESTERN RY.—		
Barachois to Douglastown. Que.		20.50
BRANDON TRANSFER RY.—		
Brandon, Man. ...		1.20
CANADIAN NORTHERN ONTARIO RY.—		
Trenton to Deseronto, Ont.	31.00	
Harrowsmith to Sydenham, Ont..	3.00	
Gowganda Jct. to Ruel, Ont.	13.00	
		47.00
*CANADIAN NORTHERN RY.—		
Extensions in Manitoba	75.00	
Branch lines in Saskatchewan ..	185.00	
Vegreville-Calgary branch, Alta...	40.00	
Warden towards Brazeau River, Alta.	50.00	
Main line towards Yellowhead Pass, Alta.	50.00	
Line towards Peace River, Alta.	30.00	
Branch to Athabasca Landing, Alta.	40.00	
		470.00
CANADIAN NORTHERN PACIFIC RY.—		
Port Mann to Chilliwack B.C.		46.00
CANADIAN PACIFIC RY.—		
*ONTARIO.		
Coldwater Jct. to Bethany Jct. ..	76.50	
SASKATCHEWAN.		
*Moose Jaw south	35.00	
*Swift Current southwest	45.00	
*Swift Current northwest	35.00	
Wilkie northwest	32.00	
Imperial-Valeport	59.00	
Bulyea south	7.00	
Weyburn westerly	23.80	
Moose Jaw northwest	53.00	
ALBERTA.		
Lethbridge-Aldersyde	56.80	
Castor-Coronation	21.00	
Irricana easterly	17.50	
BRITISH COLUMBIA.		
Jukeson-Fort Steele	9.20	
*Galloway-Waldo	11.00	
		481.80
ESQUIMALT AND NANAIMO RY.—		
Cameron Lake to Port Alberni, B.C.....		26.00
GRAND TRUNK RY.—		
Birch to Tay, Ont.		8.90
GRAND TRUNK PACIFIC RY.—		
SASKATCHEWAN.		
Balcarres to Regina	61.00	
Meacham to Wakaw	42.00	
ALBERTA.		
Red Deer southerly	22.00	
Bickerdike southerly	30.00	
Pedley, on main line to B.C. boundary	74.00	
BRITISH COLUMBIA.		
Yellowhead westerly	25.00	
		254.00
KETTLE VALLEY LINES—		
Midway to Westledge, B.C.	25.00	
Merritt to Coldwater, B.C.	30.00	
		55.00
*MIDLAND RY. OF MANITOBA—		
From C.N. Ry. to station in Winnipeg		8.00
NATIONAL TRANSCONTINENTAL RY.—		
New Brunswick	0.73	
Quebec	155.31	
Ontario	124.21	
		280.25
QUEBEC AND SAGUENAY RY.—		
Mileage 56.54 to 64, near Murray Bay..		7.50
QUEBEC CENTRAL RY.—		
Extension to St. Sabine, Que.		1.44
SOUTH ONTARIO PACIFIC RY.—		
Guelph Jct. to Progresston, Ont.		5.90
SYDNEY AND LOUISBURG RY.—		
Morien to Birch Grove		2.50
TEMISKAMING AND NORTHERN ONTARIO RY.—		
Iroquois Falls to Timmins	33.71	
North Bay Jct. to Nipissing Jct.	3.53	
		37.24
VANCOUVER, VICTORIA AND EASTERN RY.—		
Princeton to Coalmount	12.00	
Abbottsford to Kilgard	6.00	
		18.00
		1,827.33
Actual track laid in 1910		1,870.44

Orders by the Board of Railway Commissioners.

The following have been issued in addition to those given on pp. 16 and 17.

15595 Dec. 12.—Authorizing Saskatchewan Government to build highway over C.P.R. in s.w. ¼ sec. 30, tp. 15, r 13, w 3 m.

15596. Dec. 9.—Suspending Wabash Rd. tariff 686 re baggage of excess size until parties can be heard.

15597. Dec. 12.—Approving location of C.P.R. station at Lydiatt, Man.

15598, 15599. Dec. 12.—Approving revised location of Dominion Atlantic Ry. from west side of St. George St., Annapolis, N.S., to west side of Allens Creek, 2,790.5 ft., and authorizing rebuilding of Allens Creek bridge.

15600. Dec. 14.—Approving C.N.O.R. plans for undercrossing of C.P.R. at Smiths Falls.

15601. Dec. 14.—Authorizing Esquimalt and Nanaimo Ry. to cross with its Cowichan Lake branch two highways in British Columbia.

15602. Dec. 13.—Authorizing C.N. Pacific Ry. to use crossing of C.P.R. Mission branch for construction purposes only until Feb. 29, 1912, pending installation of interlocker.

15603. Dec. 18.—Approving revised location of C.N.O.R. Montreal-Port Arthur line through Bristol, Clarendon and Litchfield tps., Que., mileage 162 to 176 from Montreal.

15604. Dec. 19.—Ordering C.N.O.R. to install improved type of eleotric bell at crossing near Brighton.

15605. Dec. 16.—Authorizing C.N.O.R. to build bridge over Blende River, at mileage 23.96 east of Port Arthur.

15606 to 15608. Dec. 18, 19.—Authorizing C.N.R. to cross with its Maryfield line public road between secs. 12 and 11, tp. 5, r. 8, w. 2 m., and with its Swift Current line 10 highways in Saskatchewan.

15609. Dec. 15.—Approving Alberta Central Ry. location from its main line 135.58 miles west of Red Deer to Big Horn Range coal fields, mileage 0 to 28.

15610. Dec. 19.—Authorizing G.T.P.R. to cross highway at mileage 197.2, r. 6, Cassiar district, B.C.

15611. Dec. 18.—Approving plans of G.T.R. station at Stevensville, District 19, Southern Division.

15612. Dec. 19.—Authorizing C.P.R. to open for traffic its Swift Current to Brooks branch from mileage 0 to 33.

15613. Dec. 19.—Authorizing C.P.R. to operate until June 30. 1912, its Wilkie northwesterly branch from its Pheasant Hills branch, mileage 0 to 27.8 between Wilkie and Cutknife, Sask.

15614. Dec. 16.—Approving revised location of C.P.R. Lauder extension between mileage 32.28 and 54.63, Sask.

15615. Dec. 16.—Authorizing C.P.R. to cross with its Wilkie northwesterly branch, 14 highways between mileage 13.90 and 25.78, Sask.

15616. Dec. 18.—Authorizing C.N.R. to cross with its Maryfield line 16 highways in Saskatchewan.

15617. Dec. 13.—Approving overhead clearances of West Canadian Collieries, Ltd., for C.P.R. siding at Bellevue, Alta.

15618. Dec. 20.—Approving location of C.N.R. Grosse Isle extension, mileage 4.33 to 25.68, w.p.m., Man.

15619. Dec. 19.—Authorizing G.T.P.R. to cross highway at mileage 204.5, r 6, Cassiar District. B.C.

15620. Dec. 19.—Authorizing G.T.R. to build spur for joint use with C.N.O.R. on Don Esplanade, Toronto.

15621. Dec. 12.—Authorizing C.N.R. to build spur line to Hospital for Insane, North Battleford. Sask.

15622. Dec. 13.—Authorizing Dominion Atlantic Ry. to build spur from its Cornwallis Valley branch to Government Wharf, at Canning, N.S.

15623 to 15625. Dec. 15, 13, 9.—Authorizing C.P.R. to build spurs for Alberta Consolidated Coal Co., near Elcan ballast pit, Anderson and Rosenroll, near Olnaton, Alta., and Wiens and Reimer at Foam Lake, Sask.

15626. Dec. 14.—Authorizing Esquimalt and Nanaimo Ry. to build spur on Vancouver Island, at mileage 47.5, from Victoria to near Crofton at mileage 0.78, Chemainus district. B.C.

15627. Dec. 18.—Recommending to Governor in Council for sanction, lease by C.P.R. of Alberta Ry. and Irrigation Co.

Changes in Baggage Regulations.

Some important changes in baggage regulations will go into effect on July 1, 1912. For some years the transportation companies have had great difficulty in handling extremely large sample and personal trunks, particularly the "innovation" or wardrobe trunk. Some commercial trunks are over 4 ft. square, while the wardrobe trunk is made so that it must stand upright, having bulging sides and top, and some times measuring 70 to 80 ins. in length. This trunk will take up the space of at least four ordinary trunks.

In the baggage car an aisle space must be maintained so that baggage may be handled en route, records taken, etc., and this space must be wide enough to permit of the passage of a fairly large man, or the pulling from the tier of an average sized trunk. Some baggage cars have only a clear width of a little over 100 ins. At a meeting of the Trans-Continental Passenger Association in Chicago in Jan. last it was recommended that for any single piece of baggage (excepting immigrant baggage checked at the port of landing), the greatest dimensions of which exceeded 40 ins., there would be a charge for each additional inch equal to the charge for 10 lbs. of excess baggage, and that any piece of baggage, the greatest dimensions of which exceed 70 ins., would not be accepted for transportation in baggage cars. A strong objection was made by a number of trunk manufacturers and other industrial interests in the United States, and to cooperate with them it was finally decided that commencing July 1, 1912, and until June 30, 1914, for any single piece of baggage (excepting immigrant baggage checked at the port of landing) the greatest dimensions of which exceed 45 ins., there will be an additional charge for each additional inch equal to the charge for 10 lbs. of excess baggage, and that after July 1, 1914, for any piece of baggage of any class (excepting immigrant baggage checked at the port of landing) the greatest dimensions of which exceed 40 ins., there will be an additional charge for each additional inch equal to the charge for 10 lbs. of excess baggage, and that no piece of baggage of any class, the greatest dimensions of which exceed 70 ins., will be accepted for transportation in baggage cars.

The Board of Railway Commissioners has passed an order suspending sine die the Canadian Northern Ry., Ottawa and New York Ry., and Wabash Rd. tariffs for baggage of excess size until all parties can be heard.

Steel Rail Orders.

The Canadian Pacific Ry. has ordered from the Algoma Steel Co. and the Dominion Iron and Steel Co. about 150,000 tons of steel rails.

The Grand Trunk Ry. gave an order some little time since to the Dominion Iron and Steel Co. for 15,000 tons steel rails 100 lbs., and for 11,000 tons 80 lbs. The 100 lb. rails were delivered in Dec. and the 80 lb. ones are to be delivered in Jan. and Feb.

ELECTRIC RAILWAYS

Canadian Street Railway Association.

PRESIDENT, James Anderson, General Manager, Sandwich, Windsor and Amherstburg Ry.; VICE PRESIDENT, P. Dubee, Secretary Montreal Tramways Co.; SECRETARY-TREASURER, Acton Burrows, Managing Director, The Railway and Marine World.

ASSOCIATION'S OFFICE, 70 Bond St., Toronto.

EXECUTIVE COMMITTEE.—E. P. Coleman, Manager of Railways, Dominion Power and Transmission Co.; H. M. Hopper, General Manager, St. John Ry.; J. E. Hutcheson, Superintendent, Ottawa Electric Ry.; C. B. King, Manager, London St. Ry.; D. McDonald, General Manager, Montreal Tramways Co.; M. N. Todd, President, Galt, Preston and Hespeler St. Ry.

ASSISTANT SECRETARY, Aubrey Acton Burrows, Secretary and Business Manager, The Railway and Marine World.

OFFICIAL ORGAN, THE RAILWAY AND MARINE WORLD.

British Columbia Electric Railway Co's Annual Report.

The report presented at the annual meeting in London, Eng., recently covered the year ended June 30, 1911. Following are extracts:—

Gross receipts increased $1,323,028 or 43%, and net earnings, including income from investment and subsidiaries, and after charging renewals, increased $369,521 or 34%.

The following charges were made against the revenue account of the year:—Provision for renewals maintenance, £76,136 0s. 3d. Written off old steam plant, £10,000. Added to capital amortization fund, £2,182 15s. 4d. The net profit for the year, after making the deductions is £281,126 1s. 3d. Add balance brought forward from last year, £5,606 16s. 1d. Total, £286,732 17s. 4d. Out of this balance was paid interest on debentures and debenture stock £82,670 11s. 2d., dividend on 5% cumulative perpetual preference stock £35,000, dividend on preferred ordinary stock £42,000, and 6 months dividend on deferred ordinary stock to Dec. 31, 1910, £32,000, or £191,670 11s. 2d., leaving available for further distribution and reserve £95,062 6s. 2d., out of which the directors recommend payment of a dividend in the deferred ordinary stock of 4% for the half-year ended June 30, making 8% for the year, and absorbing £32,000; transfer to reserve fund £56,472 3s. 6d. and carrying forward to the current year £6,590 2s. 8d.

A large amount of construction work has been carried on during the year, not only in new developments, but in extensions of the existing railway, lighting and power systems. A large terminal station and central offices, necessary to meet the requirements of the business, are in course of construction in Vancouver, and a handsome new station was recently opened in New Westminster.

The growth of the business is indicated by the following figures:—Miles of track in operation—1909, 97.74; 1910, 141.65; 1911, 233.65. Total cars of all classes—1909, 248; 1910, 427; 1911, 647.

The number of passengers carried during the year was 46,541,448, an increase for the year of 12,064,644. A satisfactory feature of the year's business is the growth of the revenue received from the new suburban lines.

During the year great dislocation of traffic and large expense to the company has been caused by the large amount of street paving and improvement that has been undertaken by the cities of Vancouver and Victoria. This has not only adversely affected the company's profit, but has caused much irregularity in the service and consequently great inconvenience to the public.

Considerable progress has been made with the construction of the dam at Coquitlam, an undertaking which is the largest of its kind in Canada. This dam, when completed, will be 90 ft. high and contain about 554,000 cu. yds. of earth work, and by its means the level of Coquitlam Lake will be raised 60 ft., rendering 54,000 million imperial gallons of water storage available for power purposes. The enlargement of the tunnel between Lake Coquitlam and Lake Buntzen, which has been in progress during the last two years, has been successfully completed. This tunnel, 12,755 ft. long, originally had a cross sectional area of about 81 sq. ft., and has been enlarged to 172 sq. ft., thus increasing its capacity three times. It is now possible to bring up the power at Lake Buntzen to upwards of 70,000 h.p., which will be available to meet the rapid growth of the demand in Vancouver.

There is being installed at the power house a third 10,000 h.p. water wheel, which it is hoped will be ready for operation in Dec., bringing the capacity of the plant there up to 42,000 h.p. Plans are being prepared for a large extension of the power house and the provision of two new 15,000 h.p. turbine units. In addition, the company has in progress an extension of the auxiliary steam plant, which has been provided for temporary breakdowns on the transmission lines, bringing the capacity of the steam plant up to 12,000 h.p.

Plans have now been filed with the Government for the construction of plants for the utilization of the company's water powers at Lillooet and Jones Lake, Chilliwack. The board has a carefully considered scheme for the provision of power to meet the requirements of the company in future years. On Vancouver Island the installation of a water power at Jordan River has been satisfactorily completed, and there should shortly be available a sufficient quantity of power to meet the increasing demands of the city of Victoria, and district.

The company has commenced the construction of a line of about 20 miles from Victoria through the fertile Saanich peninsula, and it is generally expected that this line will considerably augment the growth of the undertaking in Victoria, which, during recent years, has been making rapid strides.

Towards the end of 1910 the directors were asked by the city of Vancouver to consent to a unification of the franchises, under which the company operates its railway business in various parts of the city and suburbs, with a view to facilitating the consolidation of the city and the various separate suburban municipalities which surround it into one great city. The directors consented to enter into an agreement whereby the municipality would have obtained the right to purchase the company's railway lines within the extended limits of the new city in 1934, but in the negotiations that followed, some of the representatives of the city endeavored to introduce restrictions of a general nature to which the directors could not see their way to agree, and, in consequence, no arrangement has been concluded. The company operates its line within the narrow boundaries of the old city under statutory powers and subject to an agreement renewable in 1919 for successive periods of five years, until the city determines to buy the railway property within the old city limits. The price, in the event of dispute, is to be fixed by arbitration. In fixing the purchase price, the arbitrators are to take the then market value of all lands to be taken over, and the value of all improvements, buildings and machinery then made, affixed or erected on the lands, and of the personal property to be taken over, which values shall be arrived at by taking the cost to the company, including the cost of constructing the railway lines and of installing all the plant and machinery, and deducting therefrom a reasonable sum for depreciation. The portion of the company's railway which the city of Vancouver will be entitled to purchase represents 49 miles out of a total of 234 miles operated by the company. Should the city exercise this right the company will retain various lines of entry into the city in perpetuity or for a long period of years. The whole of the remaining lines are operated under franchises extending over periods of not less than 36 years. The company's business has during the last few years developed to such an extent, particularly in the outlying districts, that the receipts from the railway lines within the old city limits are no longer such an important part of the whole receipts of the company as they were, and are steadily becoming a smaller proportion of the whole. The lighting franchises are either perpetual or for a very long period of years.

To prepare for handling a greatly extended and increased volume of business in the future, the directors, after consulting with the General Manager, thought it advisable to engage additional expert assistance, and decided to associate with the management several highly qualified officials to take charge of important departments, now rendered necessary by the magnitude of the business.

The gross receipts for the year were £901,553, net revenue, £302,993; number of passengers, 46,541,448.

The statement of expenditure on appropriations on capital account, amounting in all to $2,786,529.77, includes the following items:—Rolling stock, $773,039.59; permanent and double tracking and sundry improvements, $433,242.09; track extensions, $365,107.87; power extensions, $142,378.26; steam plant, $148,360.00; lands and buildings, $348,727.57; electrical machinery, $119,457.18. North Vancouver: Rolling stock, meters, transformers and initial installations, $38,181.79; railway feeders, $14,804.14.

Re-winding Coils at Levis County Railway Shops.

A very economical and satisfactory method of utilizing old field coils is used by the Levis County Ry., of which A. K. McCarthy is Manager. The customary practice with old, blown-out coils is to scrap them at the prevalent scrap copper rate of about 10 cts. a pound. This practice was followed by the company until early last year, when the more economical method to be described in this article was devised and put into operation at its shops.

The old coil, discarded for various reasons, the principal ones being blow-outs, is attached to a circular plate mounted on a shaft running in bearings. The insulated wire led off from this, is passed through a little device for keeping the wire taut. This device consists of two old trolley wheels permanently fixed on bearings, with an intermediate wheel adjustable vertically to the line joining the centres of the two fixed wheels. Adjusting puts a bend in the wire of the necessary depth to hold it

taut. A receiving reel is mounted on an iron trestle. Directly attached to the reel shaft there is a large gear meshing, with a pinion on a shaft through the trestle and connected to a handle for drawing the wire into the reel.

The taut wire between tightening attachment and receiving reel is scraped clean of insulation by an operator, another operator at the handle drawing the wire through as required. This operation is performed very quickly.

When the wire is completely cleaned, the containing reel is placed in the position of the reel containing the old wire. The wire, passed through the tightening device, is fed on to a coil form on the receiving arbor shaft. Between the tightening device and receiving form an operator tapes the wire, another operator feeding it on with the handle, as before. A coil as good as the original one is thus obtained at small cost.

Figures obtained from Mr. McCarthy show that big savings result. A coil costing $20 to replace may be wound complete at a total cost of $7.50. Considering that the coil if scrapped would sell for $2 at 10 cts. a pound, a total saving of $10.50 is obtained, or more than 50% on the cost price. On a road such as the Levis County Ry., the lines of which are very hilly, blow-outs, especially in the springtime, are quite frequent, which under the old system necessitated discarding the whole coil. It is estimated that upwards of $300 was saved last spring alone by the use of this method.

While wage accounts for the road have been materially increased recently, the introduction of a couple of such economical schemes has kept the total expense account nearly constant.

All Steel Sweeper for Ottawa Electric Railway.

An all steel electric sweeper is being built for the Ottawa Electric Ry., three views of which are given in the accompanying illustration. In general appearance, the sweeper closely resembles an electric locomotive of the usual type, having the central cab with the sloping end compartments.

The centrality of control will be noted in particular, all control levers and wheels being within easy reach within the central cab. The centre controlling wheel in the plan is for the raising and lowering of the side ploughs, while the control wheels towards each end are for the raising and lowering of the sweeper brooms in their curved ways.

There are two traction motors of the Westinghouse 101 B 2 type to each truck, in the usual location under the car. The broom motors, one in each compartment at the ends of the control compartment, and offset as indicated, are Westinghouse 12A. The Westinghouse SM1 air compressor is housed in one of the broom motor compartments. The trucks are of the 27-FE-1 type, and the controllers of the K35 type.

The design is entirely new throughout, the frame and superstructure being constructed entirely of steel. This makes a heavy construction, much heavier than strength would demand, but for sweeper service, heavy weight is necessary to keep the machine up to its work. It is calculated to be able to do this satisfactorily.

The sweeper is being built by the Ottawa Car Co. and was designed by its Superintendent, W. K. Jeffrey.

Guelph Radial Railway Co.'s Annual Meeting.

The report for the year ended Sept. 30, 1911, shows a net gain of $7,749.83, after deducting a maintenance charge of $7,300 The earnings show an increase of $3,815.15 over those of the previous year. The number of passengers carried during the year was 820,836, an increase of 151,884 over the previous year, and the number of transfers issued was 69,497. Following are details of the balance sheet and profit and loss account:—

ASSETS.

Cash in bank	$ 17,731.22	
Cash on hand	10.00	
		$ 17,741.22
Accounts receivable		471.37
Real property, book value—		
Line construction	$111 917.83	
St. Patrick Ward extension	20,971.66	
Dundas Road bridge	2,502.48	
New equipment	192.23	
		135,584.20
Supplies on hand—		
Sundry car barn supplies	$ 1,701.65	
Track	24.50	
Line rail, etc.	75.00	
Power house	145.60	
Oil and waste, etc.	178.50	
Coal	200.00	
Stationery	76.80	
		2,402.05
Deferred charges—		
Unexpired insurance	$ 159.13	
Taxes paid in advance	405.71	
		564.84
		$156,763.68

LIABILITIES.

Sundry unpaid accounts, power	$ 342.57	
Crossing, G.T.R.	30.35	
		$ 372.92
Capital stock subscribed	144,000.00	
Capital stock paid up		138,870.00
Surplus profits Oct. 1, 1910	15,999.35	
Less dividend	$3,780.00	
1908 taxes paid 1909-10	2,148.42	
	5,928.48	
	10,070.93	
Add profits 1910-11	7 449.83	
		17,520.76
		$156,763.68

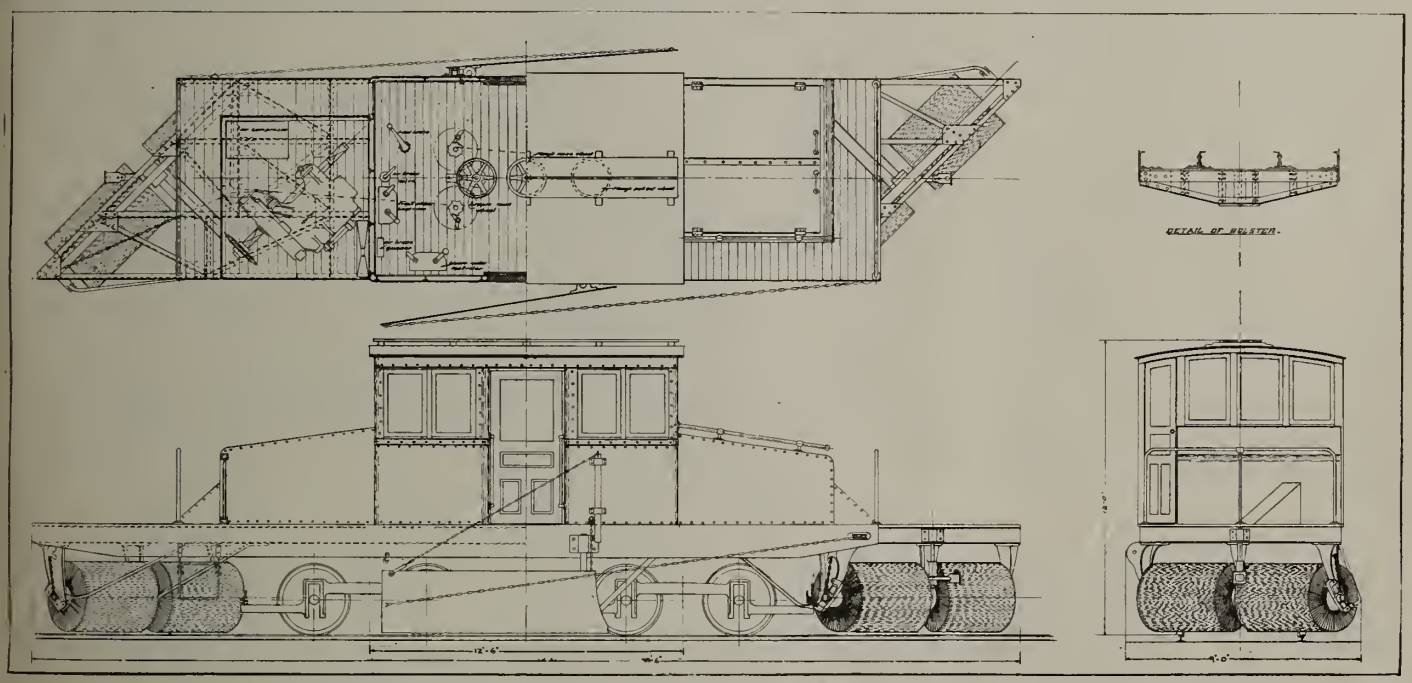
PROFIT AND LOSS ACCOUNT.

RECEIPTS.

Earnings, passenger	$31,903.43
Earnings, freight	959.55
Advertising	278.00
Rent	246.71
Sale of power	153.00
Rink receipts	378.65
Park receipts	110.53
Interest on bank balance	152.67
	$34,182.54

EXPENDITURE.

Official expense and salaries	$ 1,501.25
Stationery	233.62
General expense	90.67
Insurance	496.20
Taxes	1,627.67
Park expense	1,039.67
Hotel expense and taxes	24.25
Rink expense	209.89
Passenger operating	8,390.83
Freight operating	249.97
Freight charges	49.08
Car barn, maintenance and wages	4,709.68
Power	2 951.97
Battery expenses	10.04
Coal	1,994.07
Oil and waste	99.65
G.T.R. crossing	402.98
Track	1,292.87
Painting	657.83
Line	700.52
	$26,732.71
Net profit	7,449.83
	$34,182.54



All Steel Sweeper for Ottawa Electric Railway.

The Dominion Power and Transmission Co. has ordered three interurban cars, 55 ft. long over all, mounted on Baldwin trucks, with steel tired wheels, equipped with Westinghouse straight air brakes, turtle roofs and Garland ventilators; and three double truck city cars, standard type, from the Preston Car and Coach Co., Preston, Ont.

Electric Railway Projects, Construction, Betterments, Etc.

Alberta Electric Ry.—The Land Traction Co. was incorporated under the Companies Ordinance no. 1417 of the province of Alberta, Sept. 15, with a capital of $500,000 in two classes of shares, and office at Calgary, with power to enter into agreements for the construction of railways of all kinds, and particularly for the financing and construction of the Alberta Electric Ry. The directors are: Dr. T. H. Blow, G. E. Wood, W. A. Lowry, C. S. Drummond, S. E. Beveridge, John Breckenridge, all of Calgary. C. S. Drummond, the Managing Director, was formerly a director of the British Electric Traction Co., London, Eng., and J. Breckenridge is described as a railway contractor. The secretary of the company is S. C. McGregor. The company has acquired all the charter rights of the A.E. Ry., paying in respect of the same 10,000 B shares of $25 each, which are to rank for dividend at the rate of 6% after a 5% dividend has been declared on the 10,000 A shares. The company offered for subscription, the list closing Nov. 11, the A shares and 900 bonds of $500 each bearing 5% interest, redeemable in 30 years by means of a sinking fund of 2% per annum. The proceeds of the issue will, the prospectus stated, be applied to the building of the first section of the company's lines. The A.E. Ry. is authorized to issue shares to the value of $10,000,000 and bonds to the amount of $36,000,000. No lines are to be built until the routes have been approved by the Lieut.-Governor-in-Council. In preparation for making the application for this approval municipalities are being asked to grant rights for the building of the lines along public highways, and farmers are being asked to give free right of way where it is not convenient to have the line on the highway. Application is being made for a Government guarantee of the interest on the construction bonds as the lines are built. (Nov., pg. 1067.)

Bassano, Alta.—Press reports state that the Gorman, Clancy and Grindley Co., Calgary, Alta., have been given a contract for the building of five miles of an electric railway from Bassano to the C.P.R. irrigation dam.

Another report states that a franchise has been granted for the building of an interurban electric railway, by the Bassano council, and that eight miles of the line are to be in operation within 90 days after the passing of the bylaw.

Berlin and Bridgeport Electric St. Ry. We are advised that the project for the building of a belt line referred to in our last issue, is not in connection with the B. and B.E. St. Ry., but with the Berlin and Waterloo St. Ry., which is owned by the Berlin town council and operated by commissioners. The project has been under discussion for some time, but no definite progress has been made.

Application is being made to the Ontario Legislature for an act changing the name of B. and B.E.S.R. Co. to the Berlin and Northern Electric Ry. Co., increasing the capital stock to $400,000, declaring that all existing municipal bylaws relating to the company shall continue in force, and authorizing the building of a line from Bridgeport to Elora and Fergus, Ont.; erecting bridges across the Grand River and its branches as may be necessary; authorizing the company to carry freight over its lines, and giving power to amalgamate with other companies, etc. (Dec., 1911, pg. 1171.)

Brandon, Man.—As the result of the recent vote in the city of Brandon, favoring the operation of a street car system by private ownership, negotiations were reopened with J. D. McGregor, Dec. 1. He has submitted a draft agreement, which is under consideration by the council's railway committee. Another proposal has been submitted by Donnam and Co., New York, covering in addition to a street railway franchise, the supply of water, light, heat and power. (Dec., 1911, pg. 1171.)

British Columbia Electric Ry.—The Vancouver city council is applying to the B.C. Legislature for amendments to the Vancouver Incorporation Act of 1900 by providing, among other things, that $503,000 a year shall be set aside from 1912 to 1919, inclusive, out of the city's borrowing powers for the purpose of acquiring the company's lines in the city under the terms of clause 34 of the agreement of Oct. 14, 1901. If the lines are not acquired the franchises are not to be extended until a new agreement has been voted on by the ratepayers.

Judgment has been reserved by the Court of Appeal upon the question of the validity of the company's franchise in Point Grey. The company is not directly a party to the action which was brought by certain ratepayers against the council.

The Burnaby municipal council has decided to proceed with an action to test the validity of the company's franchise. (Dec., 1911, pg. 1171.)

Calgary Municipal Ry.—The Calgary, Alta., city council has accepted tenders for the supply of ties, poles, rails and other materials for extension of its lines to be built during 1912. The Board of Railway Commissioners has authorized the city to carry its tracks across the C.P.R. at 12th Ave., near 6th St. (Dec., 1911, pg. 1171.)

Cape Breton Electric Co.—A. S. Pratt, representing Stone and Webster, Boston, Mass., who manage this company, recently made an inspection of the company's lines, etc., at Sydney, N.S., and is reported to have said that $125,000 had been expended upon improvements to the various properties during 1911. (May, 1911, pg. 453.)

Chatham, Wallaceburg and Lake Erie Ry.—We are advised that the company has under consideration the construction of the following additional lines:—Cedar Springs to Blenheim, Ont., 4.5 miles, and a spur line in Chatham, 1.25 miles. (June, 1911, pg. 555.)

Chestermere and Calgary Suburban Ry.—Construction is being proceeded with on this line, under an agreement with the city of Calgary, Alta. The starting point is not Crescent Heights, as a press report referred to in our last issue stated, but a point inside the city limits of Calgary, and connecting with the city lines. The line from Calgary to Chestermere Lake will be about 17 miles, and is being built by day labor by the company. We are advised that all the heavy grading has been done; and that the pole line has been completed. It is expected to have track laid by April 30, and to have the cars running shortly thereafter.

Application is being made to the Alberta Legislature for an act amending the company's charter in some details, and extending the time within which the lines may be built. (See Calgary to Chestermere, Alta., Dec., 1911, pg. 1171, and C. and C. St. Ry.)

Edmonton Interurban Ry.—The Alberta Legislature is being asked to amend chap. 49 of the statutes of the second session of 1910, by extending the time for the building of the line from the foot of Perron St. in St. Albert, to the boundary of the city of Edmonton. Bishop, Pratt and Delavault, Edmonton, are the solicitors.

Edmonton Radial Ry. - Strathcona Radial Ry.—The estimates under consideration for the extension of lines, improvements, additional rolling stock, etc., in Edmonton, Alta., for the current year, amount to $596,000, distributed as follows:—Extensions of tracks, $213,700; track improvement, $107,000; new car barns, $125,000; rotary convertors, $30,000; fifteen new cars, $112,000, the balance being set aside for miscellaneous purposes. (Dec., 1911, pg. 1171.)

Galt, Preston and Hespeler St. Ry.—Press reports state that the town council of Galt, Ont., has granted the necessary privileges for a single line extension, with necessary switches and turnout, to serve the new industrial subdivision beyond the water works. (Jan., 1911, pg. 71.)

Greenwood-Phœnix Tramway Co.—It is reported that considerable progress has been made with the boring of the tunnel between Greenwood and Phœnix, B.C., via the Boundary Creek Valley. The distance between the two points is 17,000 ft., and the hill rises above the tunnel at Phœnix to a height of 2,000 ft. The size of the bore is 9 by 8 ft., in which is to be laid a tramway line to be operated by electricity. Up to Nov. 30 it was reported that 3,000 ft. had been bored, and that work was being pushed forward at the rate of 10 ft. a day. The city of Greenwood has voted $50,000 towards the project. (June, 1911, pg. 555.)

Guelph Radial Ry.—An extension of the line from the centre of the city of Guelph, Ont., easterly for 1.25 miles has been completed, and we were advised, Dec. 7, that cars would be put in operation over it within a few days thereafter. (July, 1911, pg. 683.)

Hull Electric Co.—The company has under consideration a project for the extension of the line from mileage 6.25 for 3,100 ft. to the Ottawa Racing Association's track. (Nov., 1911, pg. 1069.)

Hamilton, Waterloo and Guelph Ry.—In addition to the extension of time already applied for, the company is applying to the Dominion Parliament for authority to increase its capital to $9,000,000. (Dec., 1911, pg. 1171.)

Lethbridge, Alta.—The taxpayers carried a bylaw, Dec. 11, authorizing the council to raise $450,000 by debentures for the building of an electric railway in the town. (Dec., 1911, pg. 1171.)

Levis County Ry.—During 1911 the company extended its upper town line two-thirds of a mile. (Dec., 1910, pg. 1069.)

London Street Ry.—The London, Ont., city council is considering the question of what additional mileage it is enabled to have laid under the franchise, on the basis of the present population. It is estimated that the city is entitled to between two and three miles of line. The matter is being discussed with C. B. King, the company's Manager, who told the council at its last meeting that three propositions were under consideration, and that plans would be submitted early in the year. (Dec., 1911, pg. 1711.)

Moncton Tramways, Electricity and Gas Co.—The first cars were run over the newly constructed street railway in Moncton, N.B., Nov. 30, and a regular service was put in operation Dec. 13. This is the second street car line put in operation in the city, the first having been inaugurated in 1896. After a checkered career it was abandoned and the rails taken up in 1902. (Dec., 1911, pg. 1171.)

Montreal.—The city council has under consideration a recommendation from the board of control that application be made to the Quebec Legislature for authority to build an underground electric railway system in the city.

Montreal and Southern Counties Ry.—During 1911 the company completed an extension of its tracks from St. Lam-

bert, Que., to the Country Club, 1.25 miles. It has under construction an extension from St. Lambert to Chambly, 14 miles. In addition to this St. Lambert-Chambly line, the company has on its programme, according to statements reported to have been made in an interview by W. B. Powell, General Manager, Dec. 1, several additional lines. One of these will start from Longueuil and will extend through Bouchierville to St. Charles, Que., and a branch from St. Lambert to Laprairie. In connection with the first mentioned of these two lines, the land owners in the Bouchierville district passed a resolution at a public meeting to give a right-of-way 40 ft. wide, on condition that the company maintain the fences and gates along it. The question of the electrification of the Montreal and Province Line, and its operation as part of the M. and S.C. Ry. is reported to be under consideration.

Press reports further state that plans for the erection of a car barn 205 by 85 ft., an additional power house, workshops and offices are under consideration.

Petitions were presented to the Montreal city council, Nov. 30, in favor of permission being given the company to build additional lines in the city. The controllers desire the company to try and make some arrangement with the Montreal Tramways Co. (Dec., 1911, pg. 1171.)

Montreal Tramways Co.—E. A. Robert, President, is reported as having stated, Dec. 2, that the company would be prepared to lay its plans for extensions and general improvements before the city council at an early date.

The town of Montreal West is applying to the Quebec Legislature for authority to execute a contract with the Montreal Park and Island Ry. Co., its representatives and assigns, and to approve a bylaw naming the Montreal Tramways Co. in the contract in place of the M.P. and I Ry. (See Montreal St. Ry., Oct., 1911, pg. 975.)

Niagara, Welland and Lake Erie Ry.—The Board of Railway Commissioners has authorized the company to carry its line across the G.T.R. spur track on Muir St., Welland, Ont. (June, 1911, pg. 557.)

North Midland Ry.—A bylaw granting the company a bonus of $25,000, and providing for raising the same by debentures will be submitted to the London, Ont., taxpayers Jan. 1. The bylaw also provides for a right to run cars along certain streets in the city. At the voting in Jan., 1911, a bylaw authorizing the city to guarantee the company's bonds to the amount of $1,200,000 was passed, provided a suitable agreement was arranged, but it was found to be impossible to arrange terms, and the new bylaw is proposed as a substitute. A suggestion has been made for the erection of a terminal station to be used by all electric railways entering the city, and the council is considering the advisability of building this as a municipal enterprise.

The company proposes first to build a line from London via St. Marys to Stratford. A bylaw granting a bonus of $5,000 will be voted on Jan. 1, in St. Marys, and Stratford is being asked for a bonus of $15,000. A. E. Welch, in asking for this latter bonus, told the Stratford council that he had been instructed by the British interests behind the company to obtain all the franchises necessary so that construction might be started at an early date. (Dec., 1911, pg. 1171.)

Oshawa Electric Ry.—During 1911 the company rebuilt 3,800 ft. of track, the work being necessitated by the laying of new pavements by the town. The old steel was relaid, but new switches, new ties and other new fixtures were used. In addition there have been added 809 ft. of new spurs to industrial concerns. (July, 1911, pg. 683.)

Ottawa Electric Ry.—We are advised that the company has under consideration a project for building an extension from the Bank St. terminus to Ottawa South, one mile.

We are officially advised that the O.E. Ry. is not interested in the proposal to build an electric railway from Ottawa to McGregor Lake. It is said that the promoters are E. Wellingford and Dr. Corno, Ottawa, but that while plans have been outlined, the wnole proposal, including the laying out of a summer resort at McGregor Lake, is still under consideration. (Dec., 1911, pg. 1173.)

Ottawa, Smith's Falls and Kingston Ry.—The prospectus filed with the Provincial Secretary, Toronto, sets out that the company was incorporated by the Ontario Legislature Mar. 8, 1911, with a capital of $1,000,000 and office at Ottawa. The provisional officers and directors are:—Chairman, F. A. Heney, Ottawa; Vice Chairman, E. Kidd, M.P., North Gower, Ont.; Secretary-Treasurer, G. L. Dickenson, Manotic, Ont.; General Manager, U. L. Upson, Ottawa. Other directors—N. P. McGrath, Ottawa; Rev. D'A. T. Clayton, J. C. Graham, Kars, Ont.; J. E. Caldwell, City View, Ont.; J. C. Graham, Kingston, Ont.; Solicitor, F. B. Proctor, Ont. It is intended, according to the prospectus, to start construction as soon as 2,500 shares of the capital stock have been disposed of and 10% thereof paid up.

The plans show a line from Ottawa passing through or near City View, Manotic, Kars, Bridge View, Burritt's Rapids, Andrewsville, Merrickville, Kilmarnock, Smiths Falls, Lombardy, Newboyne, Portland, Elgin, Morton, Seeleys Bay, Brewers Mills, Washburn, Joyceville, Cashendall, and Kingston Mills to Kingston. An alternative route has been surveyed from Seelys Bay to Kingston Mills, passing through or near Heeleysville, Sunbury, Mount Cheshire and Maple Lawn. A branch line has also been surveyed from Smiths Falls passing through Perth to Lanark. The construction programme outlined divides the main line into two sections—Ottawa to Smiths Falls, 47 miles, and Smiths Falls to Kingston, about 60 miles. The surveys for the section from Ottawa to Smiths Falls have been completed, and those from Smiths Falls to Kingston have been partially made.

The population to be served on the Ottawa-Smiths Falls section is placed at 106,800, and the estimated cost of construction at $430,000, or, with the addition of $21,000 for supervision, engineering and legal expenses, and $18,000 for two 50-ton locomotives, three freight cars, two combination cars and two coaches, $469,500. The estimated revenue from this section is placed at $160,000 and the operating expenses at $96,096, leaving a surplus of $64,064 for interest, dividends, etc. The company is authorized to issue bonds for $30,000 a mile of line constructed. The estimated cost of the Smiths Falls-Kingston section, subject to revision on completion of surveys, is placed at $934,500, including supervision, etc. No estimate of earnings for this section has been made. (Nov., 1911, pg. 1069.)

Porcupine Rand Belt Electric Ry.—The Ontario Legislature is being asked to incorporate a company with this title to build an electric railway from the eastern boundary of the province in McGarry tp. southerly to Larder City, westerly to Dane tp., and crossing the Temiskaming and Northern Ontario Ry. westerly to Kenogamissee Lake on the Mattagami River, with branch lines as necessary, any or all of which may be connected with the T. and N.O. Ry. or other railways serving the district. While it is intended to operate the line by electricity, authority is asked to use any other motive power. Corley, Price and Garvey, Toronto, are solicitors for applicants.

Quebec Ry., Light and Power Co.—The Montmorency division has a double track from Quebec to Montmorency Falls, and we are officially advised in connection with the reports that a second track is to be laid at Ste. Anne de Beaupre, that this will depend very largely on what business is offering after the completion of the Quebec and Saguenay Ry., which is under construction from near St. Joachim, on the Montmorency Division, to Murray Bay.

A new double-track line from Beauport to Kent House Park, 3.58 miles, was completed and put in operation during 1911. The work was done by M. Lonergen, Quebec. (Dec., 1911, pg. 1173.)

Regina Municipal Ry.—The work for 1911 was completed Nov. 30, with the opening of the South Railway St. and Lorne St. sections. There are seven miles of line in the city, the first portion of this mileage having been placed in operation July 29.

The construction for 1911 included the laying of 35,280 ft. of 80 lb. steel, with the necessary paving, and 21,000 ft. of 76 lb. steel on unpaved streets, which distance was ballasted. This is practically 10.66 miles of line. The extensions projected for construction duringt he current year include 2.5 miles of single track on paved streets, and 15.5 miles of single track on unpaved streets. On the paved streets 80 lb. steel will be used, and on the unpaved streets 60 lb. steel.

Ridgeway to Crystal Beach.—Press reports state that arrangements are being made for the building of an electric railway from Ridgeway to Crystal Beach, on Lake Erie, Ont., and that already $12,000 has been subscribed. G. Pettit, E. W. Near and W. G. Athol are reported to be interested in the project.

St. Thomas Street Ry.—A bylaw will be submitted to the taxpayers, Jan. 1, to authorize the city council to extend the municipal electric railway from St. Thomas to Port Stanley, Ont. The city engineer was instructed to provide estimates as to the cost, so that, if the project is favored, a bylaw may be prepared authorizing the raising of the money not only for building the new line, but for improving the existing line. (May, 1911, pg. 455.)

Saskatoon Electric Ry. and Power Co.—Application is being made to the Saskatchewan Legislature to incorporate a company with this title to build an electric railway within the city and within a distance of 25 miles from the city boundaries, and for the purpose of acquiring H. M. E. Evans' rights in a contract for the building of such a railway, etc. Short, Woods, Biggar and Collisson, Edmonton, Alta., are solicitors for applicants. (See Saskatchewan Power Co., Dec., 1911, pg. 1173.)

Sherbrooke Ry. and Power Co.—Application is being made to the Quebec Legislature to extend the area within which the company may carry on its operations, to confirm certain agreements, and to authorize it to carry on the additional business of a water company, gas company, etc. (Nov., 1911, pg. 1069.)

Sudbury-Copper Cliff, Ont.—A press report states that a franchise has been granted to L. La Forest for the building of an electric railway from Sudbury to Copper Cliff, Ont.

The Sudbury, Copper Cliff and Creighton Electric Ry. Co. was incorporated by the Ontario Legislature in 1903 to build a line between these and adjacent points.

Three Rivers, Que.—Press reports state that it is proposed to start construction upon the projected electric railway in that municipality early in the spring. Construction will be started within the city limits, and the radial lines will be built subsequently. About 5.5 miles of line are to be built by the city council under the authority of the bylaw recently passed. (Nov., 1911, pg. 1071.)

Toronto and York Radial Ry.—While no additional mileage was added during 1911, about half a mile of a double track line was built on a private right-of-way on the Mimico Division, in the vicinity of Mimico Creek, the track along the Lake Shore road being abandoned. (Dec., 1911, pg. 1173.)

Toronto Civic Car Lines.—We are officially advised that the work on the car lines proposed to be built by the city of Toronto up to the present has been of a preliminary character, including some grading. It is not intended to push construction actively until the spring.

The City Engineer laid before the board of control recently a complete plan and report upon a system of subway and surface electric railways prepared by E. L. Cousins, Assistant Engineer in charge of railway and bridge work. The Teraulay-Yonge St. subway, which is to be voted on on Jan. 1, is the central feature of the plan, but as outlined the completed proposal provides for the building of a subway from Keele St., on the Lake Shore road, to the Woodbine, along Queen St., another from Keele St., along Bloor St. to Sherbourne St. to meet an extension of the city car line now under construction on Danforth Ave., with surface car lines connecting the subways along Keele St., Pape Ave., and Coxwell Ave. This latter line would be connected with the Gerrard St. line now under construction. Provision is also made for future extensions in the east along Woodbine Ave. to St. Clair Ave.; on Leslie St., and on Don Mills Road; and on the west along St. Clair Ave. to Jane St., down Jane St. to Bloor St., and along Bloor St. to a junction with the subway. A line from Bloor St. to St. Clair Ave. is planned along Runnymeade Ave., and another is proposed from Jane St. to Keele St., along Annette St., while the Keele St. line is to be extended from Bloor St. to St. Clair Ave. The estimated cost for the construction of the whole of these lines is $25,000,000, including equipment. (Dec., 1911, pg. 1165.)

Winnipeg Electric Ry.—The total mileage of new track laid during 1911, exclusive of second track and sidings, was 10.75 miles, distributed as follows: Donald and Princess Streets to Marion St., Ellen and Sargent avenues to Sutherland Ave., Pembina St. to Sherbrooke St. subway, Stafford St. to Arlington St., Hespeler Ave. to Louise Bridge, McPhillips St. to Kennedy St., Selkirk Ave. to Garry St., and on Higgins Ave.

The rural municipality of Assiniboia is negotiating with the company respecting the erection of a bridge over the Assiniboine River west of the park, while the municipalities of St. Boniface and St. Vital are negotiating with the company for the building of a line along St. Marys road into the open country beyond the boundaries.

Uno-rail System.—A company with this title has been incorporated under the Dominion Companies Act, with a capital of $100,000 and office in Montreal, to build and operate uno-rail systems, to manufacture and sell cars and all other appliances necessary therefor, and other incidental purposes. The provisional directors are: J. Moller, D. J. Stewart, B. J. Forest, J. B. Johnson, Montreal; J. E. Conlin, Outremont, Que.

The Ontario Railway and Municipal Board and the Toronto Railway.

The Ontario Railway and Municipal Board issued an order recently directed to the Toronto Ry. Co., as follows:—

That the company issue proper and sufficient transfers to enable all passengers to reach their destination by a continuous journey, although cars of a different route may operate over part of the said journey; and that such passengers shall be entitled to perform part of their journey upon the cars of any line operating along the course of such journey; and such passengers shall, upon payment of a fare, be entitled to a transfer from the cars of any such route to any other cars.

That the company operate until further order the full service upon Dundas St. to the end of the line at Keele St., and are hereby prohibited from tying any of its cars at any point short of the end of the route.

That the company operate until further order, its cars upon the Queen St. line over the Roncesvalles Ave. line as far as Boustead Ave., where such cars may be tied and return.

Electric Railway Finance, Meetings, Etc.

Berlin and Bridgeport Electric Ry.—We are advised that a proposition is under consideration by the Commissioners of the Berlin and Waterloo Electric Ry. for the purchase of the B. and B.E. Ry.

It is reported that W. E. Breithaupt, President, has offered to sell the B. and B.E. Ry. to the Berlin council for $44,000.

Berlin and Waterloo Street Railway.—The commissioners operating the lighting plant and street railway for the town have decided to hand over to the town profits sufficient to reduce the tax rate by a mill. The commissioners propose to pay over to the town about $1,400 out of the profits of operation of the street railway during 1911, providing the ratepayers carry a bylaw to raise $7,400 to defray the cost of improving the roadbed last year. During 1911 the B. and W.S.R. carried 794,814 passengers, an increase of 87,122 over 1910. The total receipts for the year were $38,099.07. After paying operating expenses, maintenance and repairs and general expenses, including debenture principal and interest, a balance of $190.11 was reported.

British Columbia Electric Ry.—Gross earnings for Oct., 1911, $490,451; working expenses, $303,511; net operating earnings, $186,940; renewal funds, $37,936; net earnings, $149,004; approximate income from investments, $25,000; net income, $174,004, against $349,664 gross earnings; $205,266 working expenses; $144,398 net operating earnings; $25,417 renewal funds; $118,981 net earnings; $20,000 approximate income from investments; $138,981 net income for Oct., 1910. Aggregate gross earnings for four months ended Oct. 31, 1911, $1,789,692; net earnings, $615,142, against $1,247,122 gross and $531,577 net for same period 1910.

The Guelph Radial Ry. has declared a dividend of 4½% on its $126,000 of stock, which is held by the city of Guelph, Ont.

Halifax Electric Tramway.—Receipts for Nov., $17,036.85, and for two weeks ended Dec. 14, 1911, $8,033.32, against $15,992.85 and $7,176.41 for same periods 1910.

Montreal St. Ry.—Passenger earnings for Nov., 1911, $409,396.52; miscellaneous earnings, $11,079.90; total earnings, $420,476.42; operating expenses, $260,576.06; net earnings, $159,900.36; city percentage on earnings, $14,372.90; interest on bonds and loans, $15,338; rental leased lines, $607.10; taxes, $5,000; total charges, $35,318; surplus, $124,582.36; expenses per cent. of earnings, 61.97, against $355,586 passenger earnings; $10,512.34 miscellaneous earnings; $366,098.34 total earnings; $227,441.90 operating expenses; $138,656.44 net earnings; $11,692.01 city percentage on earnings; $15,768.22 interest on bonds and loans; $552.90 rental leased lines; $4,000 taxes; $32,013.13 total charges; $106,643.31 surplus; 62.13 expenses per cent. of earnings for Nov., 1910. Aggregate total earnings for two months ended Nov. 30, 1911, $862,869.17; operating expenses, $492,777.96; net earnings, $370,091.21; total charges, $71,014.72; surplus, $299,076.49; expenses per cent. of earnings, 57.11, against $752,786 aggregate total earnings; $433,191.96 operating expenses; $319,594.04 net earnings; $64,011.14 total charges; $225,582.90 surplus; 57.55 expenses per cent. of earnings for same period 1910.

Montreal Tramways Co.—The President is reported as having stated, Dec. 6 that over 85,000 shares out of 100,000 of the Montreal Street Ry. Co. had been exchanged for M.T. Co.'s stock under the reorganization plan.

Nelson St. Ry.—A meeting of shareholders was held at Nelson, B.C., Nov. 25. The financial statement was considered satisfactory. The average receipts per month to Oct. 31 were said to have been $1,231.94, and the average expenses per month, $786.34; the net revenue representing 9% upon the capital invested. It is proposed to raise an additional $12,000 of capital to further improve the line.

Regina Municipal Ry.—Under sec. 6 of the City Act, the city council of Regina closes its financial year, Oct. 31, and the City Treasurer has issued his statement for the ten months ended on that date, including the street railway accounts. The receipts for the period the lines have been in operation were $14,065.78, of which $13,805.78 was from passenger traffic and $260 from advertising. The current expenditure amounted to $9,690.62, leaving a net revenue of $4,375.16. The capital expenditure to Oct. 31 was $455,271.28.

The City Engineer reports that track has been laid on 7.5 miles of street, and regular service is given by six cars. "The results of operation to date have been the payment of all operation charges, interest on the amount invested and a credit to partly cover the sinking fund. The carrying charges and overhead expenses for so small a number of cars running are high and it is considered that by the purchase of a few more cars the net revenue will be increased and an allowance be available for depreciation. An order for six additional cars has been placed to be delivered throughout the winter and spring. Provision has been made in the $400,000 bylaw whereby any deficit will be met out of the proceeds of city property, but the operation to the present has shown that no great contribution at any time will have to be made from this source, but that the system will be self-supporting."

St. Thomas Street Ry.—A statement was submitted to the city council, Dec. 1, showing the result of the operation of the railway for the eight months ended Nov. 30, during which Alderman Price, chairman of no. 5 committee, has been acting as manager. The statement showed that 341,868 passengers were carried, and that the total receipts were $12,333.42, in comparison with 279,540 passengers and $12,118.33 of receipts for the corresponding period in 1910. The cost of operation was $13,023.73 against $11,990.52 in the same period of 1910.

Toronto Ry.—Gross earnings for Nov., 1911, $413,525.44; expenses, $211,-919.18; net earnings, $201,606.26, against $365,466.21 gross earnings; $192,103.82 expenses; $173,362.39 net earnings for Nov., 1910. Aggregate gross earnings for 11 months ended Nov. 30, 1911, $4,-350,064.62; expenses, $2,183,021.17; net earnings, $2,167,043.45, against $3,941,-125.10 aggregate gross earnings; $2,-033,438.42 expenses; $1,907,686.67 net earnings for same period 1910.

Winnipeg Electric Ry.—Gross earnings for Oct., 1911, $328,386; expenses, $158,-272; net earnings, $170,114, against $304,114 gross earnings; $151,782 expenses; $152,332 net earnings for Oct., 1910. Aggregate gross earnings for 10 months ended Oct. 31, 1911, $3,154,023; net earnings, $1,603,622, against $2,602,-499 gross and $1,296,958 net for same period 1910.

Electric Railway Notes.

The Edmonton Radial Ry. has adopted a system of electric signs for its street cars.

The British Columbia Electric Ry. has received one heavy double broom snow sweeper from the Ottawa Car Co.

The Regina Municipal Ry. has received an electric snow sweeper from the Preston Car and Coach Co., Preston, Ont.

The Quebec Ry. Light and Power Co. has been fined at the Recorder's Court for illegally operating freight cars on the city streets.

Jas. Hilton has been appointed Traffic Superintendent, British Columbia Electric Ry., at Vancouver, vice J. B. Rannie, resigned.

The Winnipeg city council has under consideration a bylaw providing for the operation of an all-night car service on the Winnipeg Electric Ry.

The Regina Municipal Ry. has ordered six single truck cars, similar to those recently supplied to the Calgary Municipal Ry., from the Preston Car and Coach Co., Preston, Ont.

A contract for advertising in the Edmonton Radial Ry. cars has been awarded by the city commissioners to John Dewar of Edmonton, Alta.

G. W. Seguin, who died at Ottawa Dec. 6, was cashier of the Ottawa Electric Ry. from 1891 to 1896, when he entered the Hull Electric Co.'s service.

The Toronto and York Radial Ry. has received three double truck, double ended pay-as-you-enter car bodies from the Preston Car and Coach Co., Preston, Ont.

The Winnipeg Electric Ry. does not propose, says Manager Phillips, to retire from the lighting business. "No such move," he adds, "has ever been considered by the officials."

The London and Lake Erie Ry. and Transportation Co. is negotiating with the Hydro-Electric Power Commission for current to operate its line from London to Port Stanley, Ont.

The Montreal St. Ry. Mutual Benefit Association is applying to the Quebec Legislature for authority to change its name, and for additional powers concerning the administration of its affairs.

G. B. Hughes, heretofore Engineer of Surveys for Canadian Northern Pacific Ry. lines on Vancouver Island, Victoria, B.C., has been appointed Engineer of Construction, British Columbia Electric Ry.

The Moose Jaw Electric Ry. has received a heavy double broom sweeper, and two 21 ft. pay-as-you-enter car bodies, mounted on 21-E trucks, 31½ ft. long over all, from the Ottawa Car Co.

The Montreal Tramways Co.'s officers for the current year, as elected recently, are: President, E. A. Robert; Vice President, J. W. McConnell; General Manager, D. McDonald; Secretary, P. Dubee.

N. C. Pilcher, whose portrait appears on this page, was appointed Manager, Sherbrooke Ry. and Power Co., Sherbrooke, Que., Sept. 1, 1910, prior to which he was for some time Manager, Port Arthur and Fort William Electric Ry.

The city of Toronto is making application to the Ontario Railway and Municipal Board to compel the Toronto Ry. to put an additional 200 cars into service, and to run all cars to the ends of the respective lines on which they operate.

The Calgary Municipal Ry., in addition to the 12 cars and one sprinkler, which it has on order with the Preston Car and Coach Co., Preston, Ont., as mentioned in our Nov., 1911, issue, has ordered, from the same company, one scenic car.

The British Columbia Electric Ry. has received from the Baldwin Locomotive Works a freight locomotive, to be used mainly for emergency purposes. It will probably be used as well for hauling heavy loads of logs from the Fraser Valley line.

P247 N. C. Pilcher,
Manager, Sherbrooke Railway and Power Co.

N. R. Bugg, who was associated with the promotion of the Peoples Ry., was arrested at Berlin, Ont., on a charge arising out of subscriptions to the stock of the company on allegations made by J. Irvine, Feversham, Ont. He was committed for trial to the county court at Owen Sound, Ont., and was admitted to bail.

The Middlesex, Ont., county council passed a resolution Dec. 10, protesting against the granting of charters for the building of radial railways to irresponsible parties, and asking the Dominion Parliament and the Provincial Legislature not to grant any further charters unless the applicants have given sufficient guarantees of good faith and financial responsibility.

H. M. Graham, who appeared recently at Lindsay, Ont., representing himself as an engineer making surveys for a branch of the Toronto Eastern Ry. from Port Hope to Orillia, Ont., was arrested Nov. 27 on charges of fraud, and was subsequently sentenced by the police magistrate to three years imprisonment. Toronto Eastern Ry. officials informed the police that Graham was not in the company's employ, and that the company had nothing to do with the project he outlined. Graham admitted he was out to make money by accepting sums from landholders to change the route, which he would locate through farmyards and buildings. His liabilities are said to be over $1,000, including wages, money borrowed and board bills.

The London and Lake Erie Ry. and Transportation Co. has ordered in the United States, two electric cars, equipped with four motors and Baldwin trucks, and also two trailer cars of the same style. They are designed to be as nearly open cars as practicable, the interior panel finish being eliminated, the upright posts and the carlines in the ceiling being exposed. They are to have the new style turtle-back roof and square cornered sash instead of round and elliptic. Increased floor space is provide by omitting the panel work under the window sills, thus allowing the seats to be placed several inches nearer the side, and leaving a wider aisle. They will be equipped with Westinghouse automatic car and air couplers, and are intended specially for excursions between London and Port Stanley on busy days.

An Electric Railway Official's Family Slandered.

Vancouver, B.C., daily papers of Dec. 1, contained the following:—

During the past two months stories have been circulated concerning the family of R. H. Sperling, General Manager of the B.C. Electric Ry. Co., which were slanderous in the extreme. Despite the fact that the story was a barefaced falsehood, its details being such as to cause any person acquainted with Mr. Sperling or his family to promptly deny the tale without further reference, it has been given wide circulation from mouth to mouth.

While friends and acquaintances of Mr. Sperling have steadily denied the story, the manner in which it has been continually circulated has caused him considerable annoyance, although he has daily been at his office and directing the work of his company during the entire period of its circulation.

Believing that the slanderous story was started on its course by parties who intended that the tale should injure his high reputation and prominent standing in Vancouver, Mr. Sperling has issued a notice offering a reward of $10,000 for information which will lead to the identification and conviction of the person or persons responsible for the slanderous stories.

Fenders or Wheel Guards for Electric Railway Cars.

The Board of Railway Commissioners on Dec. 20 notified all electric railway companies under Dominion jurisdiction to file within 60 days plans showing the system of fenders or wheel guards in use on their equipment.

This action has probably been taken with a view to issuing an order requiring the companies to use certain fenders or wheel guards which may be approved by the Board.

The C.P.R. Telegraph Department has opened offices at Burdette, Noble and Woodhouse, Alta.: Fraser Mills station, B.C.; Bigwood, Mississippi, Walkerville Jct., Ont., and Amulet, Craven, Evesham, Imperial, Primate, Renown, Richardson, Rosetown and Young, Sask.

MARINE DEPARTMENT

Dominion Marine Association.

PRESIDENT, F. Plummer, Toronto; COUNSEL, F. King, Kingston, Ont.

Great Lakes and St. Lawrence River Rate Committee.

CHAIRMAN, E. E. Horsey, Kingston, Ont.
SECRETARY, Jas. Morrison, Montreal.

International Water Lines Passenger Association.

PRESIDENT, W. M. Lowrie, New York.
SECRETARY, M. R. Nelson, New York.

The Shipping Federation of Canada.

PRESIDENT, A. A. Allan, Montreal: MANAGER, AND SECRETARY, T. Robb, 526 Board of Trade, Montreal.

Ship Masters' Association of Canada.

GRAND MASTER, Capt. J. H. McMaugh, Toronto, Ont.; GRAND SECRETARY-TREASURER, Capt. H. O. Jackson, 376 Huron St., Toronto.

The Intercolonial Railway's New Deep Water Terminal at Halifax.

To such an unexpected extent has the volume of freight passing through the port of Halifax increased of recent years, that the Government Railways Managing Board has been forced to map out a comprehensive plan of extension by which it is hoped to care for the constantly increasing traffic on the Intercolonial Ry. An idea of its rapid growth may be gathered from the fact that last winter's traffic was 100% greater than that of the previous winter, and nearly 140% in excess of the winter before that.

Halifax has two terminal points—one known locally as "Deep Water" and the other as Richmond. The deep water terminal is located quite centrally in the city proper, off Water St., while the Richmond piers are in the town of Richmond, at the northern extremity of Halifax. It is at the deep water terminal that the major portion of the contemplated improvements will be made.

Fig. 1 gives an idea of the nature and scope of the present and prospective piers at the deep water terminal. As indicated, the plan of improvements gives four piers sufficiently large to accommodate steamers of over 700 ft. in length, considerably increasing the capacity of the terminal. One of these piers, no. 2, has been contracted for. New piers 3, 4, and 5, shown dotted, are as yet in prospect. The old piers, nos. 2 to 5 are shown in full.

The majority of the old piers were of small size. Old no. 2 was practically rebuilt 15 years ago, having a second story added six years ago. This was found inadequate for general purposes, as its south side was too short for long steamers, while the north side had a basin too narrow. Old no. 3, recently rebuilt, is still in good shape, and will probably be embodied in the completed scheme, as the plans indicate.

When it was finally decided to develop a comprehensive plan of expansion, John Kennedy, Hon. M. Can. Soc. C.E., consulting engineer, Montreal, was called in, and it was under his directions that the contemplated plan was developed, and is being carried out.

SCOPE OF SCHEME.—As mentioned, the plan of improvements makes provision for four new piers. Pier 2 will be 800 by 235 ft., with freight and passenger shed, of which more will be said hereafter. Pier 3, for freight purposes only, will have the same dimensions as no. 2, and will be of the same construction. Pier 4 will also be 800 by 235 ft., with a two-storied passenger and freight shed similar to no. 2. Pier 5 is to be somewhat smaller, 650 by 190 ft., and is intended for the use of smaller coastwise steamboats and sailing vessels, as well as for transatlantic steamships. The basin width between piers 2 and 3 will

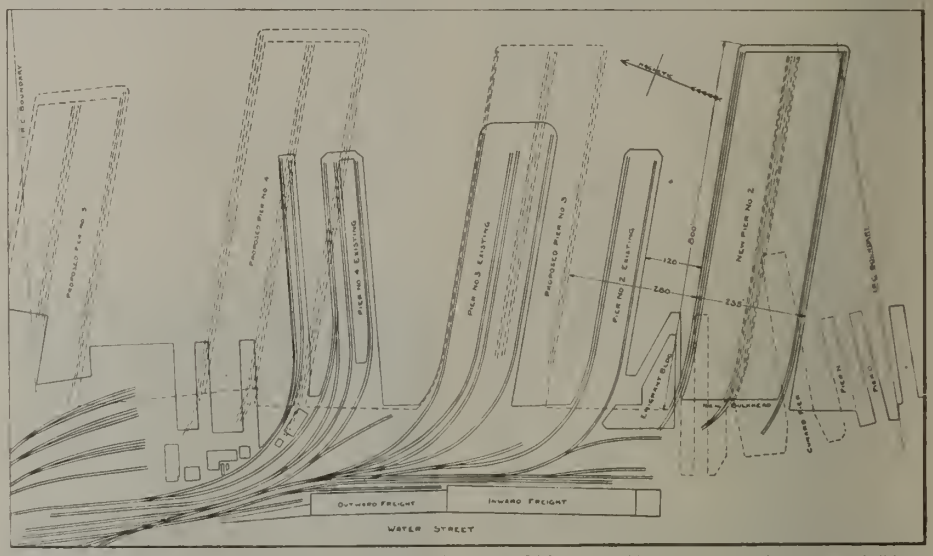


Fig. 1. Deep Water Terminus at Halifax, Showing Old Piers, New Piers and Proposed Piers.

be 280 ft., between 3 and 4, 275 ft.; and between 4 and 5, 250 ft. It is the intention to dredge these basins to a minimum depth of 34 ft. below low water.

PIER 2 is the first one of the series to to designed, and construction is being pushed forward on the work, the contract for the pier itself with shed having been let to the Nova Scotia Construction Co. for $914,600. This pier is located between the old immigration building and the Cunard pier. As the new pier merely touches the immigration building pier for a short distance, it is being retained, but the Cunard pier, owing to interference, is being completely removed.

Necessity requiring the widening of the yard to allow more room on Water St., it was decided to build a new bulkhead further out in the location indicated. The cribwork of this new bulkhead is to be built in cribs or blocks reaching up to about 2 ft. above low water, above which point the cribwork is to be continuous. The facing of this cribwork is to be of squared timber, well fitted so as to be mud-tight. The top of the bulkhead will be finished off with a coping of squared creosoted pine timbers In fact, all timbers over 3 ft. above low water are to be creosoted, the proportions being 12 lbs. of creosote per cu. ft. of timber, except for planking, when the amount will be increased to 18 lbs. These proportions are called for in all creosoted members throughout the pier.

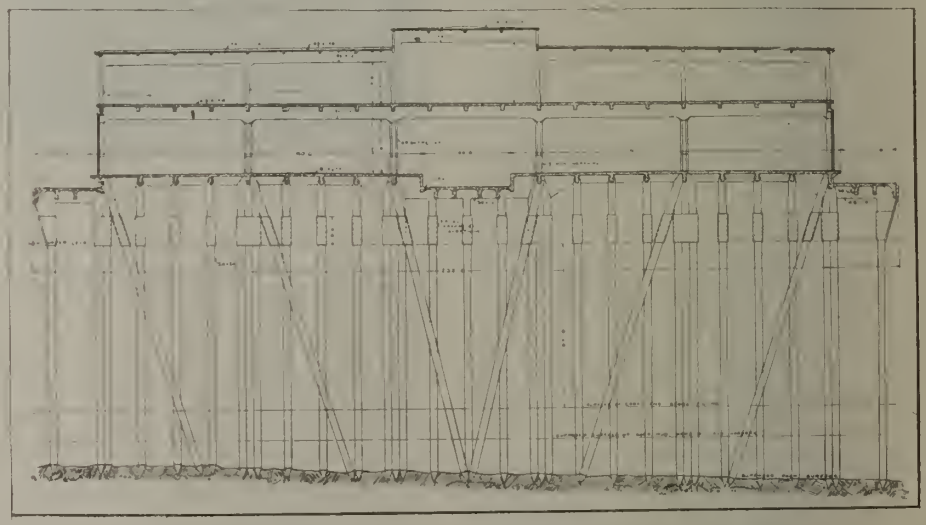


Fig. 2. Cross Section View of New Pier, Showing Construction.

The immigration building wharf coming into the field of active operation, it became necessary to strengthen the faces not removed so that they might be protected from the dredging, which will lower the basin bottom to a clear depth of at least 34 ft. all over. The water in the immediate vicinity of the immigration pier is somewhat less, thus requiring the reinforcing. This is to be accomplished by driving sheet piling of

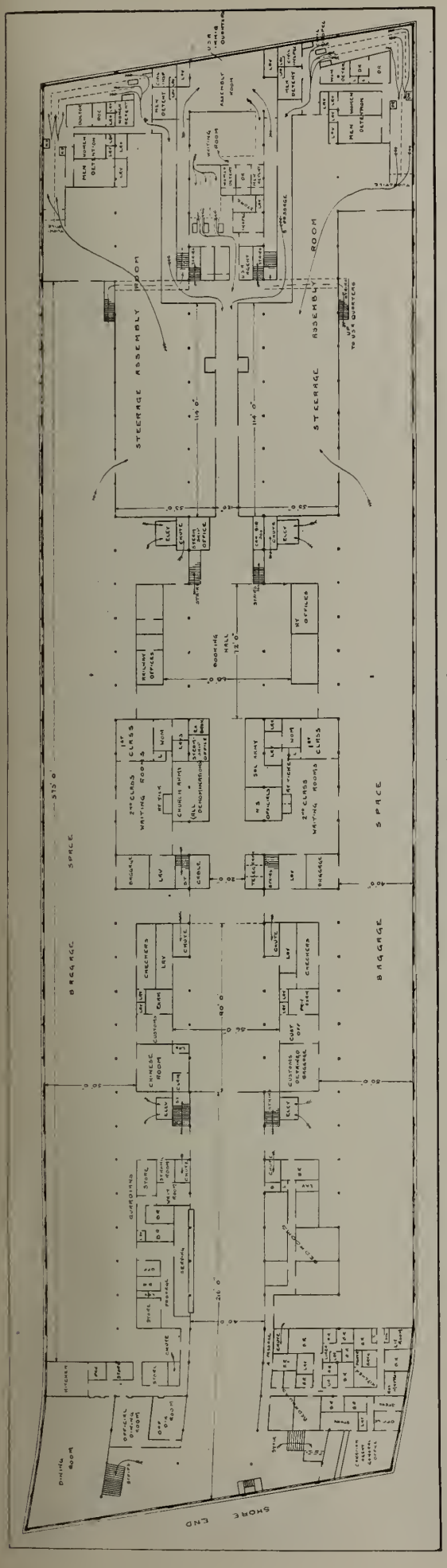


Fig. 3. Upper Floor of New Pier 2.

squared timber along the front face of the pier to the corner and for 30 ft. beyond the corner. For a further distance of 25 ft. the foundation and cribbing will be protected by round piling. The major portion of the square sheet piling is to be creosoted, and to be driven to a depth of 39 ft. or 5 ft. below the bottom surface.

Considerable difficulty was experienced in adopting some suitable mode of construction, owing to the peculiar conditions which existed, for, as the name implies, the water at this particular point is very deep. Near the outer end of the pier, the water is about 60 ft. deep, making operating conditions rather difficult. The bottom is formed of a substratum of rock, the stratum running nearly perpendicular. This presents a rough, uneven surface covered by a bed of gravel and hard pan, superimposed on a layer of thick mud. Near the outer end the mud layer is not very thick, increasing in depth nearer shore. The rough end of rock stratum gently slopes up towards the shore. At the outer end, rock depth is 67 ft., and inshore 44 ft. These unusual depths of rock bottom tended toward making construction even more difficult, precluding the use of wooden piles. These would not be desirable, even if practicable, owing to the presence of the treda navalis and limnoria, which latter are very active at this point, destroying wooden piles at the water line.

At the same time, caisson work, while quite possible, had the two disadvantages of slowness of construction and high cost, so that it was finally decided to adopt reinforced concrete piles of the construction and large size shown in fig. 4. For piles over 70 ft. long the longitudinal rods are to be 1¼ in. rounds; between 60 and 70 ft., 1⅛ in. rounds; and under 60 ft., 1 in. rounds. Four extra 1⅛ in. longitudinal rods extend up for a short distance from the pointed end. Except near the point, which has the rods wound with ¼ in. round wire at a 2 in. pitch, the rods have ¼ in. wire stirrups at a 12 in. spacing. The longest of the piles weighs about 25 tons. The concrete composition consists of 1 part of cement to 4½ of aggregates, the latter being composed of about 1½ parts of sand to 3 of broken stone. Each pile is to be made at one filling of the mould, and the concrete thoroughly rammed into place, more particularly at the water line, as it is desired to produce a concrete practically impervious to water, in order to eliminate chipping from frost. The piles must set in the moulds at least 7 days, and not be lifted under 6 weeks nor driven in less than 8 weeks. To prevent undue strain while lifting, the piles are to be raised by special clamps located a fifth of the pile length from each end. The estimated maximum load to which each pile will be subjected when in use is between 86 and 85 tons, and in order to safely sustain this weight, they will all have to be driven through the hardpan to solid rock, steam hammer and water jet being used for the purpose. The bearing power is to be tested when deemed advisable by the engineer in charge, one of the suggested means being that of a floating weight of 180,000 lbs., which at low tide will apply itself to the pile under test.

Fig. 2 gives an idea of the cross-sectional arrangement of the pier, showing the method of arranging piling and diagonal bracing. Lengthwise of the pier the piles are to be spaced 18 ft. apart, but the lateral piling is variable, depending on location of greatest loads. Each bent contains 39 piles. To protect the piles between high and low tide levels from the effects of frost, an excellent means has been adopted, consisting of sheathing the pile over a space of 8 ft. with a double layer of creosoted planking, extending 6 ins. above and below high and low tide levels respectively, the tide rising 7 ft. The inner planking of 2-in. material runs longitudinally, while the outer, of the same thickness of material, is horizontal. The piles along the outer face of the pier have a 3-in. outer jacketing instead of the 2-in. elsewhere. By these means it is expected that in the most severe weather the frost line will fluctuate in the creosoted planking, and keep away from the concrete. The disintegrating action of the alternate freezing and thawing of the surface of the concrete in cold weather, as the tide rises and falls, is well understood. If at all porous, the water is absorbed, and will, upon freezing, expand, thereby chipping or scaling the pile surface. This is doubly prevented in the case of these piles by the sheathing just described, and the densely packed nature of the concrete in the pile. All piles, the heads of which when driven extend above the level of the bottom of the transverse girders, are to have the concrete cut away and the reinforcing embodied in the transverse girders and floor beams. The concrete slabs in all cases are to be poured immediately after the pouring of the beams and girders on which they rest, no joints being permissible between slabs and beams and girders.

Referring to the deep water terminal cut, fig. 1, it will be noticed that the intention is to have two railway tracks the length of the pier through the centre of the shed, and two outside, one on each side. These are shown to better advantage in the cross-sectional view, fig. 2. It will be noticed that the flooring is raised to the car deck level above the tracks to facilitate and expedite the handling of freight. To accommodate dray traffic through the shed, there are two roadway ramps at the Water St. end, one on each side.

SUPERSTRUCTURE OR SHED ON PIER.—When planning the building to be constructed on the pier, it was decided to have it fireproof throughout, and consequently it is to be constructed entirely of reinforced concrete floors and walls, and block concrete partitions. It is essential to have it fireproof, as otherwise a serious calamity might occur, for upwards of 3,000 immigrants will be housed in the building when two large well filled steamships come in at the same time.

The building is a two-storied structure. The lower floor is of the same dimensions as that shown in fig. 3, which is a plan of the upper story. The ground floor is a plain floor, for freight purposes, covering the whole surface of the building with a series of railway, steamship and customs offices and storerooms at the shore end on each side of the two central freight tracks. Along each wall, outside of which are the exterior tracks above referred to, there are a series of overlapping doors of sheeted steel frame construction. These can be slid along to form an opening at any desired place in the full length of the building. The posts throughout the building are so arranged as not to interfere

with the free use of freight car doors, both in the building and along the side. The interior tracks are also intended for passenger purposes as well, for loading the immigrant trains.

The upper story of the building, a plan of which is shown in fig. 3, is for passenger purposes exclusively. It is divided into three main divisions—baggage rooms on the north and south sides extending the full length, with the exception of a distance of about 100 ft. at each end, and passenger rooms and offices along the whole length of the central part of the shed and across the full width at each end. The outer wall of each baggage room will have alternate doors and windows at 36 ft. door centres, so that it may receive passengers and baggage from any part of either two short or one long vessels up to the full length of the pier. The Canadian examination quarters are duplicated on the north and south sides of the shed, but the U.S. quarters are single and are approached from the north and south baggage rooms by overhead stairs and passages, so as not to interfere with the passages of the Canadian examination quarters. Near the middle of the length of the building are two suites of first and second class passenger rooms, one suite on each side of the central hall. Each of these has liberal accommodation for about 50 first class and 170 second class passengers. Commodious steerage accommodation is also provided, as shown.

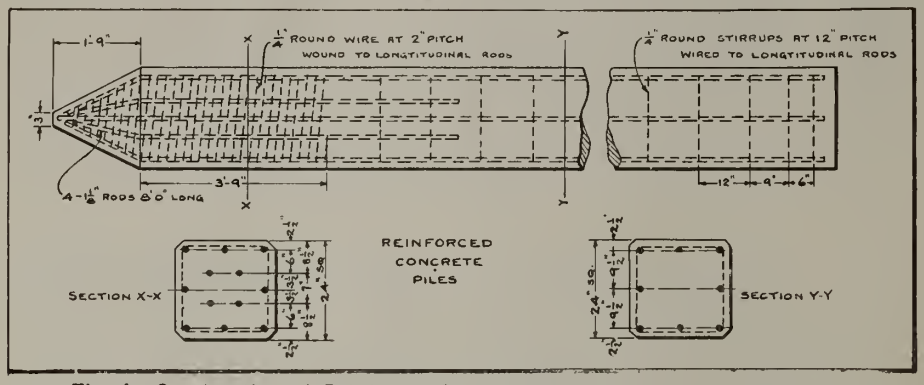


Fig. 4. Construction of Reinforced Concrete Pile used for the Pier Piling.

It is intended that the whole of both stories of the shed be lighted by electricity, and that the offices and passenger quarters of both floors be steam heated and supplied with water. It is not intended that the large baggage spaces shall be furnished with heating apparatus, because at the times when they are in most active use, steamers will be alongside, and several of the large doorways of the shed will be open, which would make heating impracticable, but apparatus can be added at any time should experience show it to be necessary.

The adoption of the plans for the deep water terminal improvements means a general shifting of the railway yard arrangements. The rebuilding of the recently constructed freight shed on another site will probably be necessary in order to provide easy approach curves to the new piers. Other equally extensive changes will likely be necessitated to bring about a completely harmonious arrangement.

The Department of Marine has given notice that the Hydrographic Survey and Tidal and Current Survey Branches have been transferred to the Department of Naval Service, and any persons desiring information respecting them should address the Deputy Minister of Naval Service. Communications respecting notices to mariners and aids to navigation should be addressed as heretofore to the Chief Engineer, Marine and Fisheries Department.

Excessive Rates for Marine Insurance.

A subscriber in Montreal writes us as follows:—

"The question of marine insurance is one which affects the whole of the importers and exporters of Canada, as the transportation of their products has to pay the insurance both of the steamers and the cargoes. It is well known in business circles that marine insurance to and from Canadian ports is very much higher than to United States ports, but few people appreciate the immense sum that this represents in competition with our United States competitors. Major G. W. Stephens, President of the Montreal Harbor Commissioners, has recently issued a plea for a readjustment of marine insurance rates on the St. Lawrence, which, however, only treats of one phase of the subject. The hulls of all our fleets of regular liners pay about 2% on their total value over similar lines to U.S. ports. The cargoes both east and west contribute at least double the rates charged to the U.S. lines, notwithstanding the fact that during the last 10 years over $38,000,000 has been expended by the Canadian Government in improving aids to navigation, including lighting, buoying and deepening the channels and entrances to our ports.

"Our inland marine has also suffered through constant advance in rates on hulls. Previous to about 1903 the rate was 3¾% for the season, which included the risk of navigation through the canals down to Montreal. This rate has been put up to 6% on the Great Lakes, 7% to Kingston, and 8% to Montreal. The heavy losses on the large U.S. steamers in recent years was the principal cause of the advance, although the large number of casualties to Canadian boats contributed to the heavy losses to underwriters, but I am of opinion that if the Dominion Marine Association took up this matter in a practical way and had their risks insured direct with the companies and not through U.S. channels, they would succeed in gradually reducing these heavy premiums, both on their steamers and cargoes.

"The Department of Marine has already taken evidence on the subject, and several attempts have been made to bring about an improvement, but the trade associations should, in their own interests, support the efforts that have been made and bring the matter before the new Minister of Marine."

In connection with the foregoing it may be said that the Dominion Marine Association came to the same opinion as our correspondent some two years ago, and took definite action. Underwriters are now keeping track of Canadian tonnage enrolled in the Canadian Lake Protective Association in separate records, and, according to the showing made, Canadian vessel owners will, or will not, be entitled to better rates than United States owners. The insurance for 1911 has been done in this way, and the Canadian Lake Protective Associations officials hope that a fair showing has been made, but there can be no doubt it will require some pressure to convince underwriters that Canadian owners can do very much better than those south of the line.

Stranding of the s.s. Cambodia.

An investigation into the cause of the stranding of the s.s. Cambodia, on Flag island, Aug. 3, was held recently by L. A. Demers, Wreck Commissioner, assisted by Capts. Lohnes and Macdonald, as assessors. Following is a summary of the judgment: The court finds that the Cambodia was stranded owing to careless navigation on the master's part through failure to utilize the chart to ascertain the strength and direction of the currents, and non-usage of the lead in view of his proximity to land and dense fog. The captain, M. A. Oleson, is severely reprimanded. The court holds that the double drowning which resulted, was due to the improper method adopted by the deceased mate, who in lashing the anchor, displayed a lack of judgment, but it is pointed out that the master was indirectly supervising the mate's actions and could have instructed him to adopt a more seamanlike method. The master is therefore warned to pay stricter attention to the actions of his officers and men in future.

Grounding of the Steamboat Corunna.

Following is the judgment of L. A. Demers, Wreck Commissioner, re the grounding of the Canadian Lake Line steamboat Corunna on Welcome Island, near Port Arthur, Ont., Oct. 6, delivered at Montreal, Dec. 6:—

The master is in default for not being, or coming, on deck whenever the mate reported that the vessel's course had not been made good, and for having failed to give definite instructions to the mate regarding courses to be steered from one point to another, and leaving the navigating of the vessel entirely to the mate's judgment. It is also of the opinion that a determined course should have been given from Thunder Cape to Welcome Island, and thence to Port Arthur, and also that it was plainly the master's duty to demand from the owners an additional compass, as the one placed on board could not be considered efficient for all purposes. As it has been stated that the master was sick, and taking that into consideration, the court will show some leniency by suspending his certificate for three months from Nov. 23.

With reference to the mate, the court finds him in default, his navigation having been performed in a careless manner, and it is evident that he never kept a lookout and showed culpable indifference in executing his duties. No effort seems to have been made to determine the vessel's position, and the court has no option but to deal with him severely, and suspends his certificate for one year from Nov. 23.

Owners of vessels should see that their vessels are fully equipped with necessary instruments in order to afford every facility to the masters and officers to navigate. In the present case, the vessel should have had another compass so situated as to afford every facility to take bearings and determine at all times the position of the vessel, as well as the error, if any, due to any cause.

During October, 1911, two employes were killed and three injured in the course of their work in connection with the navigation of Canadian waters. One of the deaths was due to drowning and one to a fall.

The Regulation of Pleasure Craft in Toronto Bay.

Following is an extract from the judgment of L. A. Demers, Wreck Commissioner, delivered, recently, at Toronto, concurred in by Capts. J. Foote and S. Crangle, in the matter of the running down of a gasoline launch by the steamboat J. T. Clark. Aug. 26, when one life was lost. The court exonerates the master and mate of the J. T. Clark from all blame in this collision. The launch was the vessel which had to keep out of the way, and according to article 23, it was her duty to slacken, stop or reverse. Sufficient warning was given by the Clark. The court cannot too strongly condemn the recklessness, which was shown in the matter by the owner of the launch. The attempt to navigate the boat, especially at night, while minus a most important part of the machinery, is reprehensible in the extreme and the whole responsibility for the casualty rests with the owner of the launch. Though the court is of opinion that pleasure craft must not interfere with the regular commercial traffic of the bay, or any waters yet when vessels, no matter to which class they belong, are in proximity to one another they must adhere strictly to the rules of the road. It further emphasizes the fact that no vessel has the absolute right of way, and that ferry boats and pleasure boats, like any trading vessels, have to deviate from their course when circumstances require and in compliance with the rules of the road. The court recommends that regulations be framed for the operation of pleasure craft on the Toronto Bay, with the object of reducing to a minimum the loss of life which has too frequently occurred in the last few years.

Loss of the s. s. Turret Cape.

Following is the judgment delivered by L. A. Demers, Wreck Commissioner, concurred in by Capts. J. B. Foote and S. Crangle, at Toronto, Dec. 8, re the stranding and subsequent loss of the Canadian Lake and Ocean Navigation Co.'s s.s. Turret Cape, on a shoal two miles southwest of Cove Island in Lake Huron. Nov. 17:—

The master, Capt. Wharry, committed a grave error of judgment in placing his vessel in the bight between Clark Point and Cove Island. His belief that his ship would have rolled had he shaped a course when off Lyal Island is not acceptable, and it is an impossibility for a navigator to ply on the lakes without meeting at times certain conditions of weather which will cause vessels to labor and roll in a seaway. In view of the fact that the master did not seem to have on his vessel, officers on whom he could rely absolutely to check over with him the work, his courses or bearings, or anything of the kind, the court is inclined to be lenient with him, and as it finds that his error of judgment is not of a culpable nature for not adopting a course which would have been the most seamanlike method of reaching Port Arthur, and failing to take sufficient soundings to determine his position, therefore his certificate will be suspended for three months from Dec. 8, 1911, to Mar. 8, 1912. The court warns him that in case of thick weather, and when hugging the shores, more frequent soundings should be taken. The mate and second mate are exonerated from blame.

Stranding of the s. s. Venture.

An investigation was held recently by Capt. Jas. Gaudin, Agent, Marine Department, Victoria, B.C., assisted by Capt. C. Eddie and Capt. B. Coombe, a Younger Brother of Trinity House, as nautical assessors, into the cause of the stranding of the Boscowitz Steamship Co.'s s.s. Venture in Johnson Strait, Sept. 18, 1911. The judgment is as follows:—

The captain, W. S. Morehouse, committed a grave omission of duty in not issuing specific instructions as to the navigation of the ship rounding Chatham Point, and instructing that a proper and constant lookout be kept. Taking into consideration the recent frequency of shipping casualties on this coast, causing considerable loss of valuable property, such incidents tend to verify an undeserved reputation which it has acquired for dangerous navigation, and also have a baneful effect on the shipping industry of this province. We therefore find that the certificate of competency of the captain be suspended for six calendar months, from Nov. 22, 1911, and recommend that he be permitted to serve as mate of a coasting passenger steamer during the suspension of his certificate. The court also finds that A. D. Bowly, chief officer, committed a grave error in not calling his master when he found the atmospheric conditions such as would have warranted him in doing so, also in not using the means at his disposal for the safe navigation of the vessel in narrow waters. It finds that no extenuating circumstances exist, and suspends his certificate for four calendar months from Nov. 22, 1911.

The Vancouver Shipmasters' Association recently passed a resolution that the suspensions were too harsh, and that the case had not been heard by men conversant with the northern coast. A committee was appointed to investigate the circumstances.

Vessels Removed from the Register.

The following vessels were removed from the Canadian register during Nov., 1911, for the reasons assigned:—Steam, Active, Montreal, 190 tons, broken up; Advance, Kingston, Ont., 14 tons, broken up; Alfred Wilson, Sarnia, Ont., 22 tons, out of existence; Brace, Hamilton, Ont., 6 tons, out of existence; Clyde, Quebec, Que., 373 tons, broken up; Electra, Charlottetown, P.E.I., 78 tons, wrecked; Flight, Kingston, Ont., 27 tons, out of existence; Frances, Kingston, Ont., 24 tons, out of existence; H. M. Mixer, Kingston, Ont., 9 tons, broken up; Houghton, Montreal, 24 tons, broken up; James, Quebec, Que., 31 tons, broken up; Lorne, Quebec, Que., 4 tons; broken up; Noname, Vancouver, B.C., 77 tons, sunk in collision; Sunburst, Victoria, B.C., 10 tons, burnt. Sailing:—Elva M., Charlottetown, P.E.I., 92 tons, wrecked; J. and L. Irving, Yarmouth, N.B., 80 tons, stranded; O. P. Silver, Lunenburg, N.S., 71 tons, lost; Theresa M. Gray, Halifax, N.S., 30 tons, transferred to Newfoundland.

The Minister of Marine, who is also Minister of the Naval Service, in speaking of the naval policy of the last Government, at Ottawa, recently, stated that nine tenders for the construction of vessels had been received, varying in amount from $11,000,000 to $13,000,000, exclusive of armor plating, armament and special supplies. He would not recommend that any of the tenders be accepted, and intimated that the whole question regarding naval policy would be taken up with the British Admiralty.

LIST OF STEAM VESSELS REGISTERED IN CANADA DURING NOVEMBER, 1911.

Name	No.	Where and When Built.	Engines, etc.	Length	Breadth	Depth	Gross Tons	Reg. Tons	Port of Registry	Owners
Gunhild	130,757	Q.M. Harbor, U. S., 1906	Screw 10½n. h. p.	61.0	12.7	5.1	27	18	Vancouver, B.C	C V Ericsson, Vancouver, B.C.
Jericho	130,794	North Vancouver, B.C., 1911	" 8 "	67.0	14.5	4.4	44	30	"	A. G. Balkwill, Vancouver, B.C.
John H. Sprott	130,758	Vancouver, B.C., 1911	" 5 "	53.3	27.5	4.9	110	75	"	Minister of Public Works for British Columbia
Leonard M.	130,759	Vancouver, B.C., 1911	" 2 "	44.0	9.8	4.1	14	9	"	L. C. Miles, Vancouver, B.C.
Minnie W.	126,672	Fort William, Ont., 1911	" 11 "	63.0	14.2	8.0	57	34	Port Arthur, Ont	Thunder Bay Contracting Co., Port Arthur, Ont.
Nahmint.	130,791	Steveston, B. C., 1911	" 6 "	67.9	15.5	6.1	45	31	Vancouver, B.C.	Wallace Fisheries, Ltd., Vancouver, B.C.
Neptune	130,633	Port Greville, N. S., 1911	" 19 "	73.4	20.5	10.7	118	80	St. John, N.B.	R. Thomson, et al, St. John, N.B.
Nortonian	130,792	Coquitlam Lake, B.C. 1911	" 3 "	47.5	12.5	4.6	26	18	Vancouver, B.C.	Vancouver Power Co., Vancouver, B.C.
Quathiaski No 3	130,793	Steveston, B. C., 1911	" 2 "	42.7	10.8	4.5	16	11	"	Quathiaski Canning Co., Quathiaski Cove, B.C.
St. J. Deschaillons	130,537	St. J. des Chaillons, Q., 1910	" 2 "	29.5	6.0	2.8	5	3	Montreal	A. Lemay, St Jean des Chaillons, Que.
Wilma	130,236	Collingwood, Ont., 1911	" 13½ "	75.3	16.4	7.7	55	37	Port Stanley, Ont.	J. A. Macdonald, et al, Port Stanley, Ont.

LIST OF SAILING VESSELS AND BARGES REGISTERED IN CANADA DURING NOVEMBER, 1911.

Name	No.	Where and When Built	Rig	Length	Breadth	Depth	Reg. Tons	Port of Registry	Owners
D. W. No. 1	130,795	New Westminster, B.C., 1911	Scow	104.8	35.0	6.7	209	Vancouver, B.C.	Davidson-Ward Co., Vancouver, B.C.
Daisy Z	130,731	Little Tancook, N.S., 1911	Schr.	39.6	10.0	5.4	11	Lunenburg, N.S.	S. Zinck, Blandford, N.S.
Dora C	130,729	" "	"	40.4	10.0	5.6	12	"	H. Cleveland, Blandford, N.S.
Lowell F. Parks	130,730	La Have, N.S., 1911	"	104.8	26.0	10.2	99	"	R. Parks, M.O., La Have, N.S.
Lund No. 3	130,760	Lund, B.C., 1911	Barge	84.8	27.2	6.0	117	Vancouver, B.C	F. G. Thulin, Lund, B.C.
M. M. Gardner	130,732	Lunenburg, N.S., 1911	Schr.	106.8	26.0	10.6	100	Lunenburg, N S	W. C. Smith, M.O., Lunenburg, N.S.
M. Robidoux	130,536	Yamaska, Que., 1911	Sloop	109.4	23.2	6.9	132	Montreal	M. Robidoux, Yamaska, Que.
Miriam G	*69,376	Parish St. Peter, Que., 1871	Bktn.	102.2	22.5	11.9	154	Sydney, N.S.	Mrs. M. S. Cruickshank, Sydney, N.S.
Oswald	130,583	Tancook, N.S., 1911	Schr.	45.0	13.6	6.8	20	Halifax, N.S.	G A. Wootten, Halifax, N.S.
St Gregoire	126,934	Baie St. Paul, Que., 1911	"	75 3	24.4	6.7	68	Quebec, Que	T. Harvey, M.O, Baie St. Paul, Que.
W Baker	130,725	Tancook, N.S., 1905	"	39.6	9.9	5.2	10	Lunenburg, N.S.	W. Baker, Tancook, N.S.

The St. Lawrence Navigation Season of 1911.

The season of 1911 opened with the arrival of the Canadian Northern Steamships' s.s. Royal George at Montreal, Apr. 27, being about 16 days later than in 1910, and closed Dec. 4 with the departure of the Head Line s.s. Bray Head, for British ports. Reports generally state that in point of tonnage of freight and numbers of passengers, both inward and outward, the season was more successful than any previous one, notwithstanding the fact that it was shorter by 13 days, and that business was to some extent interfered with by the strike in British shipping and railway circles. The customs receipts for the season were $11,638,763.01, against $10,833,191.67 for the previous year. Of the 750 ocean going vessels arriving in Montreal, 398 were trans-Atlantic and 352 coasting. During 1910 the total of vessels was 719.

The C.P.R. steamship lines report 18,750 passengers eastbound, and 40,200 westbound, against 15,012 easthound and 43,599 westbound in 1910. The freight returns of these lines show exports of 332,613 tons, and imports of 178,800 tons, against 331,955 tons exports and 184,804 tons imports in 1910.

The Canadian Northern Steamships, Ltd., reports 6,351 passengers eastbound and 13,204 westbound, against 4,047 eastbound and 9,428 westbound in 1910. Though equipped mainly for passenger trade, the two vessels of this service brought 12,750 tons of freight, and carried eastward 13,500 tons during the season.

The Allan Line reports that it carried 19,330 passengers easthound and 61,709 westbound, against 14,238 easthound and 61,688 westbound in 1910. The freight traffic was somewhat less than in 1910, which was a record year for the company.

The White Star-Dominion Line made two round trips less than in 1910, and carried 11,842 passengers more during 1911. The increase was entirely in eastbound traffic, there being a falling off in the westbound traffic.

All the other lines using the route report aggregate increases of traffic, both in passengers and freight. During the 1911 season the Cunard Line inaugurated its service to Canadian ports, with the steamships Albania, Ausonia and Ascania, which it acquired from the Cairn Line.

Canadian Notices to Mariners.

The Department of Marine has issued the following:—

118. Nov. 20.—326. General, hydrographic, tidal and current surveys transferred to Department of Naval Service.

119. Nov. 23.—327. New Brunswick, south coast, Bay of Fundy, off Negor point, gas buoy moved to former position. 328. Nova Scotia, Madame island, West Arichat, light established on wharf. 329. Prince Edward Island, north coast, change in position of Darnley point front range lighthouse. 330. Prince Edward Island, north coast, date of removal of bell buoys from their stations for the winter. 331. Newfoundland, east coast, St. Mein bay, St. Anthony harbor, Egg point, new lighthouse, change in character of light.

120. Nov. 28.—332. Quebec, Chaleur bay, Ste. Adelaide de Pabos, light established. 333. Quebec, Gulf of St. Lawrence, Magdalen islands, Alright island, hand fog horn at Pointe Basse wharf. 334. Quebec, Gulf of St. Lawrence, Magdalen islands. Pearl reef, bell buoy established. 335. Quebec, River St. Lawrence, Langlois point, name.

121. Dec. 5.—336. Nova Scotia, Bay of Fundy, Port Lorne, change in character of light. 337. Nova Scotia, North Atlantic ocean, Sable island, position of wireless telegraph station. 338. Quebec, River St. Lawrence, Bersimis river entrance, buoys placed. 339. Quebec, River St. Lawrence, Lake St. Peter, Riviere du Loup en haut, change in position of

122. Dec. 6.—340. Nova Scotia, south coast, Sambro gas and whistling buoy to be replaced during the winter months by lightship. 341. Quebec, Gulf of St. Lawrence. Anticosti lightship, change in characteristic of light, fog alarm and submarine bell.

123. Dec. 12.—342. Quebec, Lake St. Louis, buoys established between Dowker Island and Pointe Claire light. 343. Quebec, Ottawa River, Lake of Two Mountains, St. Placide, front range lighthouse increased in height. 344. Ontario, Lake Ontario, South Bay point, light discontinued.

124. Dec. 13.—345. Ontario, Georgian Bay, Owen Sound, back range lighthouse burnt down, back light temporarily discontinued. 346. Ontario, Georgian Bay, Thornbury, front light shown from tower, day beacon added to back light mast.

125. Dec. 16.—347. Nova Scotia, southcoast, Mars head, off Grampus rock, can buoy replaced by bell buoy. 348. Nova Scotia, Cape Breton island, west coast, Friar Head boat harbor, light established. 349. Nova Scotia, Cape Breton island, west coast, Margrave harbor, front range light improved. 350. Quebec, River St. Lawrence above Quebec, Pointe a Basile back range light improved.

126. Dec. 22. 351. British Columbia, Strait of Georgia, Ballenas Islands, change in position of lighthouse. 352. British Columbia, Queen Charlotte Islands, Hecate Strait, Moreshy Island, Houston Stewart channel, Koya point, name.

127. Dec. 22. 353. Ontario, St. Joseph channel, Bamford island, light discontinued. 354. Ontario, Lake Superior, Caribou island light station, new lighthouse.

Turbine Steamship for British Columbia Coast Service.

The s.s. Queen Alexandra, which has been purchased by the C.P.R., as mentioned in our Nov., 1911, issue, and which is illustrated on this page, was built in 1902, at Dumbarton, Scotland, and has since been operated in the passenger service on the Clyde, in conjunction with her sister vessel, the King Edward. Her dimensions are: length, 270 ft.; breadth, molded, 32 ft.; depth, to main deck, 11½ ft.; to promenade deck, 18¾ ft. The engine equipment consists of three separate turbines, each driving its own line of shafting, the centre turbine being high pressure, the others low pressure. At the ordinary steaming speed, the centre shaft gives 700 and the other shafts 1,000 a minute. This high velocity renders it necessary to employ a number of screw propellors of comparatively small diameter, rather than one or two of large diameter at the stern, as usual. This vessel has five propellers, one about 4 ft. diar. on the centre line of shafting, and two of 3 ft. diar. on each of the side lines of shafting. Steam is supplied by a double ended cylindrical Scotch boiler at 150 lbs. pressure. In her builders' trials she attained a speed of 21.63 knots an hour.

The Clyde Turbine Steamers Co., Ltd., from which company the C.P.R. has purchased the vessel, reports a minimum of repairs to her machinery during the nine years of operating. She was recently sent to the builders' yard for overhauling and some alterations, and while there was damaged by fire. She is expected to leave shortly for the Pacific coast, and on arrival will be placed on the Vancouver-Nanaimo-Comox run.

Turbine Steamboat Queen Alexandra, for C.P.R. British Columbia Coast Service.

The Canadian Northern Coal and Ore Docks Co. is reported to have given a contract for the doubling of its coal handling plant at Port Arthur to the Barnett-McQueen Co.

Niagara Navigation Company Acquires Two Other Lines.

The Niagara Navigation Co. issued a circular to its shareholders recently announcing that an opportunity having arisen to purchase the Hamilton Steamboat Co.'s steamboats Modjeska and Macassa, and its wharf property at Hamilton, and the Turbine Steamship Co.'s steamboat Turbinia, and wharf property at Hamilton, the directors considered it advisable to acquire these lines, which can be satisfactorily accommodated at the N.N. Co.'s Yonge St. docks, Toronto. Concentration of management should be an economic gain, and expansion of routes will be an advantage to the N.N. Co. The terms of the purchase provide for part payment in treasury stock and the balance in cash. Funds for the latter purpose will be obtained from money on hand and by the issue of 1,002 additional shares at par, viz., $100. These shares will be allotted to those who were shareholders at the closing of the books on Dec. 15, and who subscribe for them by Jan. 3, in the proportion of one new share for every seven held on Dec. 15. The purchases include only the properties of the Hamilton Steamboat Co. and the Turbine Steamship Co., viz., the vessels and Hamilton wharves, and not the capital stock. The transfer of the property is to be made on Jan. 3.

The Hamilton Steamboat Co., Ltd., which was promoted by the late T. B. Griffiths and J. B. Griffiths, now Purchasing Agent, Dominion Power and Transmission Co., was incorporated in 1887, the first directors being B. E. Charlton, J. M. Lottridge, G. E. Tuckett, T. B. Griffiths, F. Armstrong, J. Wallace and Seneca Jones. In 1893 the late G. E. Tuckett secured a controlling interest. In 1906 this passed to Æmilius Jarvis, of Toronto, and associates, and in 1909 it was bought by J. C. Eaton, Toronto, who had previously acquired control of the Turbine Steamship Co., whose steamboat, the Turbinia, has been engaged in a losing competition with the Hamilton Steamboat Co.'s vessels. The officers and directors in 1911 were: President, J. C. Eaton; Vice President, R. Y. Eaton; Secretary-Treasurer, J. J. Vaughan; General Manager, W. E. Bishop; other directors, H. McGee, C. Booth and T. A. McCrea. The company has been very successful, and since 1902 has paid regular yearly dividends of 10%. Its capital stock is $187,000, fully paid up.

The late T. B. Griffiths was General Manager in 1887 and 1888, J. B. Griffiths from 1889 to 1893, and F. Armstrong in 1894 and 1895. M. A. Kerr was Managing Director from 1896 to 1903. W. E. Bishop, who had been ticket agent at Toronto from 1890, when to Hamilton in 1896 as Manager, and was appointed General Manager in 1903, continuing to hold that position. The other officials are: P. J. Pear, Passenger and Freight Agent, Hamilton, and E. J. Callaghan, Toronto Agent.

The first boat operated by the company, the Mazeppa, which it acquired in 1887, and disposed of in 1899, was built at Hamilton in 1884, and ran between Hamilton, Burlington Beach and Burlington. She is screw driven, with engine of 50 n.h.p., and with dimensions: length, 101 ft.; breadth, 20 ft.; depth, 5.7 ft.; tonnage, 146 gross, 87 register. She is now owned by H. Oldfield, Parry Sound, Ont.

The Macassa was built at Port Glasgow, Scotland, in 1888, and rebuilt at Collingwood, Ont., in 1905. She is screw driven, with engine of 95 n.h.p., and with dimensions: length, 178.4 ft.; breadth, 24.1 ft.; depth, 16.3 ft.; tonnage, 529 gross, 234 register. She is valued at $72,000.

The Modjeska was built at Yoker, Scotland, in 1889, and is screw driven, with engine of 180 n.h.p., and with dimensions: length, 178 ft.; breadth, 31.1 ft.; depth, 12.3 ft.; tonnage, 678 gross, 461 register. She is valued at $98,000.

The Hamilton real estate and wharves are valued at about $27,000.

The Turbine Steamship Co., which was incorporated in Aug., 1903, has a capital of $150,000. The principal promoters were Hamilton people, the late Timothy Eaton, of Toronto, being also interested. About 1906 the control passed to J. C. Eaton. The officers and directors for 1911 were: President, J. C. Eaton; Vice President, R. Y. Eaton; Secretary-Treasurer, J. J. Vaughan; Manager, J. A. Goodearle; directors, H. McGee and T. A. McCrea. The first manager was G. Ellis, the second W. Wilson, and the third, J. A. Goodearle.

The Turbinia was built at Hebburn-on-Tyne, Eng., in 1904, and arrived at Hamilton, Ont., June 18 of that year. She is equipped with three compound turbines of the Parsons type, one high pressure in the centre, and two low pressure, each operating one shaft carrying one propellor. Her dimensions are: length, 250 ft.; breadth, 33.2 ft.; depth, 12.6 ft.; tonnage, 1,064 gross, 603 register. The engine is of about 500 n.h.p. She is said to have cost about $210,000. The company's wharves, warehouses, etc., in Hamilton are valued at about $25,000.

At first the Turbinia ran between Hamilton and Toronto. It is claimed that the first year she cleared about $20,000; the second year there is said to have been a loss of about $3,000. The Hamilton Steamboat Co. reduced its rates and made it impossible for the Turbinia to show a profit. In the winter of 1905-6 she was chartered by the Canada-Jamaica Steamship Co., and operated on a day run between Santiago, Cuba and Kingston, Jamaica, calling at Port Antonio. Debts were incurred which the owners had to settle, and a loss of over $20,000 is said to have resulted, besides which the vessel was considerably battered about and had to be repaired. In the summer of 1907 she was operated between Toronto, Niagara and Lewiston, but could not successfully compete with the Niagara Navigation Co.'s line. She has also run at different times between Toronto and Lake Ontario ports west of Toronto, but has not been a financial success, being an expensive boat to run, and having, in the opinion of marine men generally, been erratically managed by constant changes of routes, etc.

The combined fleet will be operated under the Niagara Navigation Co.'s name, and will include, in addition to the three vessels purchased as above mentioned, the N.N. Co.'s Cayuga, Chippewa, Corona, Chicora and Ongiara, the latter, operating on the Niagara River only. Plans for a new vessel, which will probably be a little larger than the Cayuga, are being prepared by F. E. Kirby, of Detroit, and a contract is expected to be let in the near future. If possible, the new boat, which will probably be built on Lake Ontario, will be got ready for the season of 1913, though it may not be possible to have her in service before 1914.

SAULT STE. MARIE CANALS TRAFFIC

The following commerce passed through the Sault Ste. Marie Canals for the season 1911:

ARTICLES			CANADIAN CANAL	U. S. CANAL	TOTAL
Copper	Eastbound	Short tons	16,511	115,970	132,481
Grain	"	Bushels	28,071,171	12,709,988	40,781,159
Building stone	"	Short tons	4,137	1,205	5,342
Flour	"	Barrels	2,504,686	4,741,684	7,246,370
Iron ore	"	Short tons	22,668,088	8,074,389	30,715,477
Pig iron	"	"	6,789	33,306	40,095
Lumber	"	M. ft. B.M.	28,694	529,819	558,513
Silver ore	"	Short tons			
Wheat	"	Bushels	80,013,116	17,128,795	97,141,911
General merchandise	"	Short tons	39,788	117,886	157,174
Passengers	"	Number	16,197	21,761	37,958
Coal, hard	Westbound	Short tons	453,470	1,606,739	2,050,209
Coal, soft	"	"	3,660,526	9,612,141	13,272,667
Flour	"	Barrels	125		125
Grain	"	Bushels		1,450	1,450
Manufactured iron	"	Short tons	183,189	1 188,985	372,174
Iron ore	"	"	15,758		15,758
Salt	"	Barrels	135,363	525,945	661,308
General merchandise	"	Short tons	634,469	594,275	1,228,744
Passengers	"	Number	22,983	19,010	41,993
Vessel passages		Number	6,803	11,870	18,673
Registered tonnage		Net	19,331,969	22,321,519	41,653,488
Freight—Eastbound		Short tons	25,987,104	10,442,295	36,429,399
" —Westbound		"	4,966,765	12,081,052	17,047,817
Total freight		"	30,953,869	22,523,347	53,477,216

COMPARATIVE STATEMENT FOR THE SEASONS OF 1910 AND 1911.

ITEMS.		Season 1911	Season 1910
Vessels:			
Steamers	Number	15,160	17,674
Sailing	"	1,681	1,890
Unregistered	"	1,832	1,335
Total	"	18,673	20,899
Lockages	"	13,292	14,569
Tonnages, Registered	Net	41,653,488	49,856,123
" Freight	"	53,477,216	62,363,218
Passengers	Number	79,951	66,933
Coal, hard	Short tons	2,060,209	1,658,844
" soft	"	13,272,667	11,854,883
Flour	Barrels	7,246,495	7,576,789
Wheat	Bushels	97,141,911	86,259,974
Grain	"	40,782,609	39,245,485
Manufactured and Pig Iron	Short tons	412,269	444,669
Salt	Barrels	661,308	528,610
Copper	Short tons	132,481	148,070
Iron Ore	"	30,731,235	41,603,634
Lumber	M. ft. B. M.	558,513	603,101
Building Stone	Short tons	5,342	9,635
General Merchandise	"	1,385,918	1,411,549

The Canadian canal was opened April 22, and closed Dec. 13, 1911; season 236 days.
The U. S. canal was opened April 24, and closed Dec. 16, 1911; season 237 days.

Atlantic and Pacific Ocean Marine.

Alfred Holt, founder of the Blue Funnel Line, operating steamships to various parts of the world, including a line to British Columbia ports, died at Liverpool, Eng., recently.

The Donaldson Line s.s. Almora is undergoing an overhauling at Glasgow, Scotland, necessitated by the damage caused in heavy weather during November. The December sailing of the Almora was taken by the Head Line s.s. Inishowen Head.

The Gulf Transport Line s.s. Inkula, which is being transferred to the Canadian Mexican route, when the arrangements for the taking over of the Canadian Mexican Pacific Steamship Co., by the Union Steamship Co. are completed, is being transformed into an oil burner.

The Donaldson Line commenced its service between Halifax, N.S., and Glasgow, Scotland, Dec. 2, when the s.s. Athenia sailed from St. John for Halifax, afterwards proceeding to Glasgow. In past years the vessels of this line sailed direct from St. John, but in future they will call at Halifax.

The Minister of Trade and Commerce stated in the House of Commons recently that the Government's policy would be to liberally subsidize steamship lines from Canada to the West Indies and South America, and he believed that the negotiations in progress would lead to a much better service to Jamaica and British Guiana.

It is reported in Montreal that the Richelieu and Ontario Navigation Co. is negotiating with the Quebec Steamship Co. with a view to amalgamation. It is stated that the Quebec Steamship Co.'s service would be completely reorganized so as to allow of a direct service being maintained between Montreal, Quebec and Cape Breton.

The Dollar Steamship Lines Ltd., has been incorporated under the British Columbia Companies Act, to take over the Stanley Dollar Steamship Co., the M. S. Dollar Steamship Co., and the Hazel Dollar Steamship Co., all of which are being wound up. The incorporation is in the nature of an amalgamation of companies operating vessels from which the companies took their names, all being on the Canadian register at Victoria, where the company's registered office will be.

The C.P.R. s.s. Empress of China, which was wrecked off the Japanese coast, July 26, was floated Dec. 12. She had been abandoned to the underwriters, and the work of floating her was undertaken on their behalf by the London Salvage Association. It is said that repairs will be undertaken, a survey for the purpose of inviting tenders for the work having been made at Uraga, and that the contract will probably be placed with Japanese firms at Kawasaki or another firm at Hong Kong.

The Minister of Trade and Commerce stated in the House of Commons, Dec. 1, that the suggestion that the Government should operate a steamship line between Halifax, N.S., St. John, N.B., the West Indies and British Guiana, as a part of the Intercolonial Ry. system, in preference to paying large subsidies to private companies, was a valuable one. It would, however, be a new departure, and would mean an increase in the Intercolonial Ry.'s already large capital account, and also involve the co-operation of the Railways Department with the Trade and Commerce Department.

It is announced that the Elder Dempster Co., operating steamships between Canada and Gulf of Mexico ports, and South Africa, has been merged with the Union Castle Line and the Royal Mail Steam Packet Co. Since the death of Sir Alfred Jones, the control of the Elder Dempster Co. has been in the hands of Lord Pirrie, head of Harland and Wolff, shipbuilders, Belfast, Ireland, who is also interested in the other companies named and in the International Mercantile Marine Co., which in turn controls the White Star-Dominion Line, running vessels between England and Canada. By agreement with the C.P.R., on the purchase of the Beaver Line, the Elder Dempster Co. is prohibited from operating between England and Canada.

In dealing with the operation of the Canadian Northern Steamships' Atlantic service, in the C.N.R. annual report, which was given in full in our last issue, Sir W. Mackenzie, President, stated that having regard to the organization necessary to be maintained and the demand for accommodation, which on different sailings could not be met, it was manifest that a further addition to the fleet should be made at an early date. He also said that negotiations were pending, and it was hoped that a satisfactory arrangement would shortly be made, whereby all the business offered to the steamship company could be accepted. Sir William, accompanied by D. B. Hanna, Second Vice President, Canadian Northern Steamships, Ltd., is at present in Europe, and it is likely that the matter will be dealt with during their visit.

The steamship Nascopie, which was launched at Wallsend-on-Tyne, Eng., Dec. 7, is being built to the order of Job Bros., Liverpool, and in conjunction with the Hudson's Bay Co. it will be employed in the Newfoundland seal fishery and in the company's work in the Bay, Job Bros. and Co. being the Newfoundland managers. She is 285 ft. long by 43½ ft. beam, and 29¾ ft. deep, fitted with triple expansion engines, with two boilers working under forced draught. She will carry 2,500 tons d.w. on a comparatively small draught, and will have a speed of about 14 knots on trial trip. She is to attain the highest class at Lloyds, is exceptionally heavily built so as to run through ice of considerable thickness, and her fittings for her special trade will be most complete. She will have quarters for nearly 300 sealers, besides the usual accommodation for navigating and engineering staff and crew.

The two steamships which the Allan Line has under construction in Scotland will have a displacement of about 25,000 tons, or 17,000 tons register. The dimensions will be: length, over all, 600 ft.; between perpendiculars, 570 ft.; beam, 72 ft.; depth, molded, 45½ ft. The sterns will be of cruiser form, thus enabling the steering gear to be located under the water line. The machinery consists of four turbines of the Parsons type, arranged in series, these vessels being among the first to have this system. The power will be about 19,000 shaft horse power, giving a speed of about 20 knots an hour. Arrangements are being made so that oil may be used as fuel, as well as coal, should the former be found economically suitable. Passengers will be accommodated on six decks, with capacity for 200 first class, 500 second class, and 1,000 third class passengers. Some of the first class state rooms will have baths attached, and such state rooms will be arranged as single berthed apartments. The social features, in addition to a library, music room, lounge and smoke rooms, will include a gymnasium, verandah, cafe and special card room. The vessels will be heated by electricity, steam or on the thermo-tank system, all three being applied to the first class quarters, the latter two to the second class, and the last to the third class. Anti-rolling tanks will be added to the bilge keels. The cargo capacity will be 3,000 tons, including the refrigerator space of 70,000 cub. ft.

Maritime Provinces and Newfoundland.

Capt. J. M. Allen, who had been engaged in marine life in the Maritime Provinces for a number of years, died at Halifax, N.S., Dec. 11, aged 75.

The Department of Marine has given notice that any of the bell buoys on the north coast of Prince Edward Island will be liable to removal from their stations for the winter at any time after Nov. 1 in each year, without any notice being given.

Hon. H. R. Emmerson, formerly Minister of Railways and Canals, has given notice that he will move in the House of Commons that in connection with an extension of the Intercolonial Ry., a modern steam ferry service be established across the Northumberland Strait for the transfer of cars between the Intercolonial and Prince Edward Island Rys., and that the gauge of the latter railway be changed to standard.

It is reported that the Eastern Steamship Co., operating steamships between St. John, N.B., and Boston, Mass., is to be consolidated with the Metropolitan and Maine Steamship Cos., the shareholders of the first named receiving $3,000,000 in bonds and a similar amount of stock, for their present $3,000,000 stock. It is also stated that representations have been made to the U.S. President on the subject, who has stated that an investigation will be made into the proposals.

Province of Quebec Marine.

J. A. Kane, who has been connected with the shipping business in Quebec for a number of years, died there recently, after a short illness.

V. Chateauvert, J. B. Letellier and N. Belleau have been appointed members of the Quebec Harbor Commission, in place of J. B. Laliberte, G. Tanguay and R. Larue.

It is reported that an arrangement has been made with the Quebec and Levis Ferry Co. for the operation of a ferry service between Quebec and the Island of Orleans during the winter.

The number of vessels which passed through the Lachine canal during the past season was 5,738, an increase of 157 over the previous season. The vessel tonnage was 3,761,323, and the merchandise tonnage 1,546,239.

The Sincennes-McNaughton Co. will, it is reported, place three additional tugs in service next season. Two of these will be built at Sorel, and the third is stated to be under construction in Glasgow, Scotland, and will be similar to the Sin-Mac.

The masters of vessels running into Montreal are forming an association to look after their interests generally. A press report states that nearly all the masters engaged in the local trade have signified their intention of joining, and that Capt. Mondon, of the Richelieu and Ontario Navigation Co., has been elected President for the current year.

The Minister of Marine has introduced a bill to amend the Quebec Harbor Commissioners Act, by providing that the commission shall consist of three members to be appointed by the Government in the same way as the Montreal Harbor Commission. At present the Quebec Commission consists of nine members, five being appointed by the Government, two by the shipping interests, and one each by the Quebec and Levis Boards of Trade.

The United States steamboat Raleigh, which was wrecked near Port Colborne recently, and in which disaster three lives were lost, has become a total loss. It is reported that she was not insured.

Ontario and the Great Lakes.

During the past season the Montreal Transportation Co. is reported to have handled 3,000,000 bush. more grain than in any previous season. The greater part was trans-shipped at Kingston.

The St. Lawrence and Chicago Steam Navigation Co. has declared a 5% dividend for 1911, against 3% for 1910. The dividends in previous years were: 1901, 15%; 1902, 26⅔%; 1903, 10%; 1904, 8%; 1905, 6 and 7, 10%; 1908, 7%; 1909, 8%.

The Port Bruce Fish Co.'s steam tug Governor Morton was destroyed by fire near Port Bruce, Dec. 2. She was built at Chicago, Ill., in 1893, and was screw driven by engine of 6 n.h.p. Her dimensions were, length 51.8 ft., breadth 10.4 ft., depth 4.4 ft., tonnage 15 gross, 10 register.

C. A. Magrath, ex-M.P. for Medicine Hat, Alta.; T. C. Casgrain, K.C., of Montreal, and H. A. Powell, K.C., of St. John, N.B., have been appointed members of the Canadian section of the International Deep Waterways Commission, in place of Sir George Gibbons, A. Geoffrion and A. P. Barnhill.

Toronto press reports stated recently that Capt. Jas. McMaugh, of Toronto, had died in California, and this item was reproduced in our last issue. The report was, however, in error. The death which occurred was of Robert, a brother of Capt. Jas. McMaugh, who went to California to attend the funeral.

The George Hall Coal Co., Montreal, has placed orders for two steel steamboats, specially designed for the coal trade between Charlotte, N.Y., and Montreal. They will be 250 ft. long, with a carrying capacity of 2,100 tons on 14 ft. draught, and with a speed of 12 miles an hour. It is anticipated that they will be ready for service by May 1.

Toronto press reports of Dec. 6 stated that the Niagara, St. Catharines and Toronto Navigation Co. had decided to build a sister vessel to the Dalhousie City, for operation by the spring of 1913, to Port Dalhousie. We have been officially advised that although it is probable another vessel will be built sometime in the future, the report as quoted is incorrect.

Plans for improvements in Belleville harbor are being submitted to the Public Works Department. They show the construction of a cement pier 50 ft. wide, from Church St. into the bay, 770 ft. long, at the end of which a dock, 300 by 75 ft., L shaped, will be built with sheds and cold storage railway accommodation. Provision is also made for dredging the harbor to 12 ft.

The Merchants Mutual Line has placed an order for the building of a lake freighter at Port Arthur. The dimensions will be: length, 257 ft.; beam, 48 ft.; depth, 28 ft. She is designed specially for the bulk and package freight trade between the Great Lakes and Montreal, and is expected to be ready for operation some time during next season.

The Thousand Islands Steamboat Co. is having built at Toledo, Ohio, an additional steamboat, specially adapted for the Thousand Islands service. She will be 175 ft. long by 32 ft. beam, screw driven, with a speed of 16 or 17 miles an hour. She will have accommodation for about 1,000 passengers, and is expected to be ready for placing on her route by June 1.

The Peterborough and Lake Simcoe Navigation Co., Ltd., which was incorporated under the Ontario Companies Act, in 1910, with $250,000 capital, and office at Peterboro, Ont., has assigned to W. Buller, Peterboro. At a recent meeting of creditors it was agreed to advertise the sale of the assets by tender. Bids for the four steamboats, four barges and wharf and warehouse at Ashburnham will be received to Jan. 8.

W. B. Russell, who has the completing of the Newmarket canal in hand, is reported to have stated recently that it was almost finished, the canal having reached to within a quarter of a mile of Holland Landing, being 4½ miles from Newmarket. The work included the building of three locks and the excavation of 900,000 yds. of earth. The cost to date has been stated as $1,000,000.

In our December, 1911, issue, in referring to the proposed lengthening of the Western Navigation Co.'s s.s. Kaministiquia, we inadvertently gave the dimensions of a tug of the same name registered at Port Arthur. The Western Navigation Co.'s vessel was built at Wallsend, Eng., in 1909, and is registered at Newcastle, Eng. She is of full Welland canal size, equipped with engine of 250 n.h.p., driving a screw, her tonnage being 2,173 gross, 1,401 register.

The bill to amend the Canada Shipping Act, recently introduced into the House of Commons has particular reference to the amendment of sec. 477. It is claimed that that section discriminates against Ontario vessels in the payment of pilotage dues in Montreal harbor, and the object of the bill is to place the Ontario vessels on a parity with other vessels. At the request of the Speaker, who considered it a matter which should be proceeded with by resolution, as affecting trade, the bill was withdrawn.

The United States Lake Survey reports the levels of the Great Lakes in feet above tidewater during November as follows:—Superior, 602.06; Michigan and Huron, 579.36; Erie, 571.13; Ontario, 244.50. As compared with the average November levels for the past ten years, Superior was 0.64 ft. below, Michigan and Huron were 1 ft. below, Erie 0.71 ft. below, and Ontario 1.05 ft. below. It was anticipated that during December, Superior would fall 0.3 ft., Michigan and Huron 0.2 ft., Erie 0.1 ft., and Ontario 0.2 ft.

The vessel which is under construction at Detroit, Mich., for the George Hall Coal Co., for the coal trade between Montreal and Charlotte, N.Y., will be of full canal size, with dimensions as follows: length, 257 ft. breadth, 43 ft.; depth, 21 ft. She will be of girder construction, and equipped with triple expansion engines, with cylinders 18, 29 and 48 ins. diar. by 40 ins. stroke, supplied with steam by two Scotch boilers, 12 ft. diar. by 11½ ft. long, fitted with induced draught, and she will be built under the rules of and classed 100*, in the Great Lakes register.

The Ministers of Marine and Public Works visited Toronto, Dec. 12, for the inspection of the harbor. A list of needing improvements was handed to the Ministers for their consideration, and included the closing of the old western channel, extensions to the present western channel, the widening of the approach, and the deepening of the eastern channel, the protection of the south shore of the island, more effective lights and signals, the general deepening of the harbor, provision of necessary equipment at the western channel and a central life-saving station with equipment and permanent staff for the north shore of Lake Onario. The Minister of Marine stated that the matter of lights and signals, the only part which came under his jurisdiction, would be dealt with at an early date, and the Minister of Public Works, whose department is concerned with the remainder of the proposals, promised every consideration regarding the proposed improvements.

Manitoba, Saskatchewan and Alberta.

The Saskatchewan River Coal and Navigation Co., Ltd., has been incorporated under the Saskatchewan Companies Act, with $100,000 capital and office at Prince Albert, to carry on a general coal and navigation business.

The Robert Ackland Co., Ltd., has been incorporated under the Manitoba Companies Act, with $20,000 capital, and office at Winnipeg, to take over the boatbuilding business at present carried on by R. D. Ackland, to conduct a general shipbuilding business, and to operate passenger and freight vessels.

The report of the engineers recently engaged on survey work on the Saskatchewan River, in charge of L. R. Voligny, and which has been submitted to the Public Works Department, states that the river can be made navigable for shallow draught vessels, running between Prince Albert and the Pas. The estimated cost is $1,500,000.

The draft bill for the creation of the proposed commission to administer the harbors of Winnipeg and St. Boniface was discussed at a meeting of the committee on wharfage and dockage, at Winnipeg, Dec. 15. It provides for a commission of not less than five members, three being appointed by Winnipeg and two by St. Boniface, for three years. The details are similar to those dealing with the commission's work in connection with Montreal and Toronto harbors.

A deputation of those interested in the navigation of the Red River, recently appointed to interview the Ministers of Public Works and Marine, in their report to the Winnipeg board of trade, Dec. 7, state that instructions have been given to complete as much of the work of improving the Red River channel as possible before the opening of navigation and it was also promised that other matters would be carefully considered. A bill is to be introduced by the Minister of Public Works to create a harbor board for Winnipeg and St. Boniface.

British Columbia and Pacific Coast Marine.

The Crescent Shipping Co., Ltd., has been incorporated under the B.C. Companies Act, with $50,000 capital and office at Victoria, to own and operate steam and other vessels and to carry on a general freighting business.

The Union Steamship Co. is reported to have taken over the business of the Vancouver Steamship Co. on Howe Sound, including the mail contract. The service will, it is said, be performed by the s.s. Cheslakee in place of the s.s. Tartar.

C. H. Nicholson, Manager, G.T.P. Coast Steamship Co., who returned to Vancouver recently from Victoria and Seattle, is reported to have stated that the local management of the company's dock at Seattle, Wash., has been transferred to F. Waterhouse and Co., whose offices will be there in future.

It is reported that the mail contract between the mainland and the islands has been awarded to the C.P.R., and will be carried out by its coast steamships. It was formerly held by the owners of the wrecked Iroquois, and since that disaster has been continued by a service of gasoline launches.

The repairs on the C.P.R. s.s. Princess Beatrice, necessitated by her grounding on Noble Island at the end of October, have been completed, and in addition she has been thoroughly overhauled. It is stated that she will take the place of the s.s. Tees, which recently ran aground in Kyuquot Sound, or the s.s. Queen City.

Press reports state that the steam yacht Dolaura, owned by Jas. Dunsmuir, director, C.P.R., will probably be purchased by the Dominion Government for the fisheries protection service on the B.C. coast. She was built at Paisley, Scotland, in 1908, and is stated to be on the market for about half her original cost.

The Vancouver Harbor and Dock Extension Co. has announced that work will be commenced about Apr. 1 on the proposed dock construction at Vancouver. C. F. Pretty, President, after a conference with the B.C. Premier, intended leaving for Ottawa to lay the plans and proposals before the Dominion Government.

It is reported that Twohey Bros., who have the contract for grading 100 miles of the Canadian Northern Pacific Ry. along the Thompson River valley, are building a modern light draught river steamboat, to be used in connection with the work. The dimensions will be: length, 135 ft.; beam, 35 ft.; draught, loaded, 3 ft.

Arrangements are being made for the commencement of construction of the B.C. Marine Railway Co.'s dry dock at Esquimalt in the spring. It is stated that it will be largest on the continent, being 1,000 ft. long, 100 ft. wide, 120 ft. wide at the top and 36 ft. deep. The site has been selected at Lang's Cove, adjoining the present shipyards.

The Victoria Lumber and Manufacturing Co.'s steam tug Chemainus was destroyed by fire recently at Vancouver. She was built at Chemainus in 1909, and was screw-driven by engine of 40 n.h.p. Her dimensions were, length 93.4 ft., breadth 22 ft., depth 9.8 ft., tonnage 153 gross, 71 register. She has been raised, and it is stated that she will be repaired and again put into service.

The vessel which the C.P.R. is having built at Victoria for its British Columbia coast service will be 240 ft. long, 38 ft. broad and 17 ft. deep, with accommodation for about 600 tons of freight in addition to passengers. The hull will be of steel throughout and it is expected that she will be launched next fall in time for completion for the spring of 1913. The material is being assembled and the laying of the keel will take place in the spring.

It is reported that the C.P.R. is offering its s.s. Amur for sale, and that her place will be taken by the s.s. Princess Sophia, now under construction at Paisley, Scotland. The Amur was built at Sunderland, Eng., in 1890, and is screw-driven by engine of 150 n.h.p. Her dimensions are. length 216 ft., breadth 28 ft., depth 17.9 ft.; tonnage 907 gross, 570 register. She has been lying at Esquimalt, where she was taken after stranding in the Wrangel narrows last summer.

Material is being assembled at Fraser Mills for the construction of three stern wheel steamboats for operation in the spring between Tete Jaune Cache and Fort George. Two of these vessels are intended for Foley, Welch and Stewart, G.T.P.R. contractors, and the third is for the British Columbia Express Co. The two former will be 140 ft. long with a carrying capacity of 250 tons, and they will be equipped with the machinery from the same owners' two steamboats Conveyor and Operator, which were run last year on the Skeena River. The B.C. Express Co.'s vessel will be 118 ft. long, 25 ft. beam, with a speed of 14 miles an hour.

The C.P.R. s.s. Tees ran aground on a sunken rock in Kyuquot sound, Nov. 29, breaking her propeller blades and bending her rudder post. It is stated that attempts to get into wireless communication with coast stations failed, and that the chief officer and four of the crew who left in an open boat to row to Estevan for aid were lost in the fog, and were picked up in an exhausted condition, Dec. 2, by the Dominion fisheries tug, William Joliffe, sent out to look for the Tees. Eventually the passengers were transferred to the s.s. Salvor, and the Tees was released and towed to Victoria by the company's tug Nanoose.

The C.P.R. s.s. Princess Sophia, which was launched at Paisley, Scotland, recently, is intended for the Vancouver, Victoria and Queen Charlotte Islands route. She is a single screw vessel, 245 ft. long, 44 ft. beam and 18 ft. deep, specially designed for the coast service. She will be equipped with electric lighting installation, wireless telegraphy and steam heating. Freight will be carried on the main deck, the passenger quarters being arranged on the upper, promenade and bridge decks. The christening ceremony was performed by Miss Piers, daughter of A. Piers, Manager, C.P.R. Steamship Lines, Liverpool, Eng.

The Union Steamship Co.'s s.s. Chelohsin, which will shortly be placed in service on the northern coast route, alternately with the s.s. Venture, now under the same control, has recently been completed at Belfast, Ireland, the hull having been built at Dublin. She is 175 ft. between perpendiculars, with 35 ft. beam, and built under the survey of the British Board of Trade and British Corporation, and specially strengthened for her service. The first class passenger accommodation is on the awning and shade decks. The dining saloon is on the main deck with companion way to the awning deck and has accommodation for 60 passengers. There is a large observation room on the awning deck, communicating with all the other decks. The machinery consist of two sets of balanced crank triple expansion engines, supplied with steam by two large boilers at 185 lbs. pressure. The auxiliary machinery comprises centrifugal, circulating, feed, bilge and sanitary pumps, evaporator, etc. On her trial run before leaving Belfast she attained a speed of 14.29 knots an hour, and 13 knots with 500 tons deadweight, in fairly rough weather.

TRADE AND SUPPLY NOTES.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time we wish our readers to distinctly understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pa yor its equivalent Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

The Reid Newfoundland Co. has ordered one double-equipped no. 323A motor from the Westinghouse Electric and Manufacturing Co.

The Robb Engineering Co., Amherst, N.S., has recently sold return tubular boilers to A. Fraser, Clementsvale, N.S., and L. Irving, Billtown, N.S., and a heating boiler to Gorman, Clancey and Grindley, Edmonton, Alta.

John Millen and Son., Ltd., Montreal, held their second annual sales convention there, Dec. 11 and 13, which was attended by their salesmen and a number of representatives of companies, etc., for which they are agents, F. D. Lyman, Manager of the Railway Supply Department, being the convention secretary. The convention work included addresses by the representatives above referred to, and the social features included theatre parties, a supper and a bowling contest.

The Canadian Locomotive Co.'s management has not, it is said, decided whether the proposed enlargement of its plant will be made by additions to the present plant at Kingston, Ont., or by the erection of an additional plant elsewhere. A site has been bought near Montreal, on the south bank of the Lachine canal, as a precautionary measure, in case it should be required, and Hamilton and Welland, Ont., are also being considered. The Kingston city authorities will doubtless do everything possible to hold the business there, and will probably offer a fixed taxation for a number of years, and other inducements.

The Baldwin Locomotive Works, Philadelphia, Pa., has issued record 71 dealing with locomotives built recently for industrial and contractors' service. The booklet gives illustrations and descriptive data of locomotives, suitable for industrial or contractors' service. In work of this character unusual operating conditions are frequently met, and the locomotive must be designed accordingly. Those shown have, in practically every instance, been built to meet special requirements. They cover a wide range in capacity, from light narrow gauge equipment in railway yards or large industrial establishments. In all the designs shown, truck wheels are omitted; and the entire weight of the locomotive (including, in some cases, the weight of fuel and water) is available for adhesion. The number of pairs of driving wheels used in each case, must be sufficient to carry the weight of the locomotive without overloading the track and bridges. The spacing of the wheels must be governed primarily, by the radius of the sharpest curve which the engine is required to traverse. By grouping the wheels compactly, locomotives of the types illustrated can readily be designed to enter the sharp curves and switches usually found on industrial railways. At the same time, maximum hauling capacity is secured by placing the entire weight of the locomotive on the driving wheels.

Toronto Viaduct and Union Station.—Further consideration has been given by the Board of Railway Commissioners to the plans for the viaduct along the Toronto water front and the proposed Union Station. The railway companies, the City Council and the Board of Trade could not agree on certain portions of the plans under consideration, and the various matters were adjourned until Feb. 8, when the C.P.R. will submit plans for a union station, which may solve the difficulties in the viaduct plans which the other plans are said to have developed.

A Dominion Government vessel is to be placed at the disposal of Prof. Barnes, of McGill University, Montreal, in June, for experiments in the Straits of Belle Isle with an instrument for detecting icebergs, which he has invented.

The Dominion Government has been asked by the Alberta and Great Waterways Ry. to disallow the act passed by the Alberta Legislature early in 1911, cancelling the agreement for the construction of the line.

The Fort Churchill Trading Co., Ltd., has been incorporated under the Dominion Companies Act, with $100,000 capital and office at Winnipeg, to carry on a general trading and development business, and in connection therewith to operate vessels, wharves, docks, piers, warehouses, elevators, etc.

The Chaleur Bay Lumber Co., Ltd., has been incorporated under the Dominion Companies Act, with a capital of $200,000 and office at Port Daniel, Que., to acquire the assets of the Port Daniel Lumber Co., to carry on a general lumbering business, and in connection therewith to operate vessels, piers, wharves, etc. The incorporators are,—P. O. Viall, C. R. Taylor, Port Daniel, Que.; L. D. Crear, Rutherford, N.J.; J. W. Vickerman, Cleveland, Ohio, and J. C. McDermott, Wellington, Ohio.

Among the Express Companies.

The Canadian Ex. Co. has been registered under the act respecting foreign corporations, to carry on business in Saskatchewan.

The Adams Ex. Co. is stated to be considering the question of opening an office in Vancouver, B.C., for the handling of import and export freight only.

The Board of Railway Commissioners has approved the standard tariff of maximum mileage tolls between all offices of the Alberta Ry. and Irrigation Co.'s express department.

The Canadian Northern Ex. Co. has resumed service west of Kindersley, Sask., and is receiving shipments for Alsask, Fairmount, Harwell, Marengo, Merid and Pinkham, Sask.

J. D. Chilman, a former employe, and J. Acheson were committed for trial at Hamilton, Ont., Dec. 20, in connection with the recent robbery of about $8,000 from the Canadian Ex. Co. there.

The Board of Railway Commissioners has extended the delivery and collection limits for express companies in Walkerville, Ont., to include all territory bounded on the north by the Detroit River, on the east by Maisonville Road and on the south by Edna St.

The Dominion Ex. Co. is suing A. Dini, a steamship agent in Montreal, for $3,998.59 for money orders supplied to him as its agent. The defence put in by Dini, is that he never sold nor issued any Dominion Ex. Co.'s money orders, nor had anyone any authority to sign his name to such orders.

In connection with the complaint of the town of Montcalmville, Que., before the Quebec Public Utilities Commission, respecting the delivery and collection limits of the Dominion and Canadian Ex. Cos., as mentioned in our last issue, the commission has decided that it has no jurisdiction in the matter, the companies being controlled by the Board of Railway Commissioners.

The British Columbia Ex. Co. is building another steamboat, and will operate it on the Fraser River, between Tete Jaune Cache, at the head of navigation, over the Yellowhead Pass, and Fort George. The company's other vessel is running between Soda Creek and Ashcroft, 200 miles east of Vancouver. A. Hutchison and C. Millar, of Toronto, are President and Manager respectively, and Willis West is Superintendent at Ashcroft, B. C.

The Board of Railway Commissioners passed the following order, 15411, dated Dec. 17, re application of W. J. Guest Fish Co. of Winnipeg, complaining that the Dominion Express Company had increased the rate on fresh fish, exclusive of ice, from Gimli to Winnipeg, from 60 to 80 cents per 100 lbs., and applying for an order directing the company to readjust its fish rates in Manitoba. It is ordered that the Dominion Express Co. forthwith restore, as a special tariff, its so-called Standard Tariff C.R.C. 15, from 26 to 170 miles, inclusive, in effect prior to Oct. 15, 1911, and in so doing, that it define more clearly the points between which the said tariff shall apply.

In accordance with the Board of Railway Commissioners' recent order, as given in our last issue, in connection with interchange business and through waybilling, the express companies have issued instructions to agents, etc., that commencing Jan. 1, shipments forwarded from common or exclusive points destined to offices of other companies in Canada, must be waybilled through to destination. Shipments destined to station shown as star stations in the tariffs, points on railways where there are no agents, and prepaid packages, must be waybilled direct to such stations. On shipments subject to graduate charges and carried between offices in Canada, one or both of which offices being exclusive, the through charge will be the single graduate based on the combined merchandise rate per 100 lbs. from point of origin to destination, by way of the transfer point named in the transfer tariff, which produces the lowest through charge, with a minimum through charge of 60c except that between points where the combined rates on merchandise are less than $2 per 100 lbs. the minimum through charge will be the graduated charge under $2 per 100 lbs., provided that in no case shall the charge on less than 100 lbs. be more than for 100 lbs. at the through rate, nor more than the sum of the local graduated charges. Between common points, where a joint through merchandise rate is in effect, the minimum through charge will be the same as if carried by one company. Agents are instructed that it is important that forwarding offices note on the waybill the transfer point through which the charge is figured, also the 100 lbs. rate of each company to and from the transfer point, the name of the place where the shipment is transferred to or received from another company. Through charges will be pro-rated on the basis of the local merchandise rate of each company. No company, however, will receive less than 10c, except where two or more companies perform service in competition with one company.

Telegraph and Cable Matters.

The Board of Railway Commissioners will sit at Ottawa, Jan. 8, and proceed with the general enquiry into the tariffs of tolls of telegraph companies and the settlement of proper forms for telegraph companies to use.

The Premier stated in the House of Commons recently that the Dominion Government had approved of the proposal to lay a direct cable from Auckland, New Zealand, to Sydney, Australia, and that Canada would pay five-eighteenths of the deficits arising out of its operation.

The Michigan Central Rd. station agents, telegraph and telephone operators in Canada have applied to the Department of Labor for the appointment of a conciliation board to take up matters connected with their working conditions and rates of pay, with a view to arranging a new schedule.

The Board of Railway Commissioners has extended the time within which the North American Telegraph Co., Bell Telephone Co., White Pass and Yukon Route, Canadian Pacific Telegraph Department, Grand Trunk Pacific Telegraph Co., Canadian Northern Telegraph Co., and Great North Western Telegraph Co. may charge the telegraph and telephone tolls which they were, immediately previous to July 13, 1906, authorized to charge, by 7 and 8, Ed. VII., ch. 61.

C. Bright, a son of the late Sir Charles T. Bright, who laid the first Atlantic cable, recently gave an address before the London, Eng., Chamber of Commerce, in which he advocated the appointment of a commission with overseas representation to investigate the question of Imperial telegraphs. It was eventually decided to make strong representations to the Government to cooperate with the various Dominion Governments, and especially with Canada, for the establishment of an independent and strictly all-British transatlantic cable and land line connecting with the Pacific cable.

The following changes of the C.P.R. telegraph officials are announced:—

F. J. Mahon, heretofore Superintendent, Atlantic Division, St. John, N.B., has been appointed Superintendent, Eastern Division, Montreal, vice J. F. Richardson, transferred.

J. T. Tait, heretofore Superintendent, Manitoba Division, Winnipeg, has been appointed Assistant to the General Superintendent, Western Lines, Winnipeg.

J. McMillan, heretofore Superintendent, Alberta Division, Calgary, has been appointed Superintendent, Manitoba Division, Winnipeg, vice J. T. Tait, promoted.

D. Coons, heretofore Inspector, Manitoba Division, Winnipeg, has been appointed Superintendent, Alberta Division, Calgary, vice J. McMillan, transferred.

J. F. Richardson, heretofore Superintendent, Eastern Division, Montreal, has been appointed Superintendent, British Columbia Division, Vancouver, vice J. Fletcher, reported to have been appointed Superintendent of Traffic, Eastern Division, Montreal.

The P. Lyall and Sons Construction Co. has been incorporated under the Dominion Companies Act with $3,250,000 capital and office at Montreal, to carry on an engineering, railway and general contracting business. The provisional directors are:—E. Languedoc, E. R. Perkins, A. C. Calder, S. G. Dixon, J. M. Montle, R. Brodeur, W. Taylor, Montreal.

NOTICE TO CONTRACTORS.

Tenders for Rails and Fastenings.

SEALED TENDERS, addressed to the undersigned, and marked on the envelope "Tender for Rails" and "Tender for Rail Fastenings," as the case may be, will be received at the office of the Commissioners of the Transcontinental Railway, Ottawa, Ont., until 12 o'clock noon of the 24th day of January, 1912, for approximately 14,468 gross tons of 80 lb. steel rails and the necessary rail fastenings.

Tenders must be made on the forms supplied by the Commissioners, which, with information with respect to the deliveries required, may be had on application to Mr. Gordon Grant, Chief Engineer, Ottawa, Ont.

Tenders must be signed and sealed by all the parties to the tender and witnessed, and be accompanied by an accepted cheque on a chartered bank of the Dominion of Canada, payable to the order of the Commissioners of the Transcontinental Railway for a sum equal to ten per cent. (10 p.c.) of the amount of the tender.

The right is reserved to reject any or all tenders.

Newspapers inserting this advertisement without authority from the Commissioners will not be paid for it.

By order,

P. E. RYAN,
Secretary.

The Commissioners of the
Transcontinental Railway.

Dated at Ottawa, December 13th, 1911.

NOTICE IS HEREBY GIVEN that the Grand Trunk Railway Company of Canada will apply to the Parliament of Canada, at its present Session, for an Act confirming and declaring to be legal and binding the agreement made the 1st day of December, 1911, between the Temiskaming and Northern Ontario Railway Commission and the said Company, providing for the joint use by the parties thereto, upon the terms in said agreement set forth, of the line of railway of the Commission between North Bay and Cochrane, and authorizing the said Company to run and operate its trains over and upon that portion of the line of railway constructed by the Commission from a point at or near Nipissing Junction to North Bay.

Dated at Montreal, this 5th day of December, A.D. 1911.

W. H. BIGGAR,
Solicitor for the Applicants.

It holds them all together

"AMERVAN" and "MASVAN"

FERRO VANADIUM

THE MASTER ALLOY

for producing

Anti-fatigue Steel

The Steel of Ultimate Quality

Elasticity, Strength, Toughness, Endurance

VANADIUM Steel has been proved to be the best and, ultimately, the cheapest steel for all classes of high duty service, working against shocks, vibrations and fatigue with extraordinary success and endurance. It forges, machines, welds, case-hardens and lends itself to heat treatment as readily as other steels that do not possess its manifold advantages.

American Vanadium Company

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General Agent

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Thousands of dollars are lost every year through the wasteful use of lubricating oils. The average method of storing and distributing oils in railroads, shops, steamships, etc., is so crude that loss is unavoidable. This condition is not intentional, but is due to the fact that nothing better has been brought to the attention of the officials that would systematize the oil room and eliminate excess loss and labor.

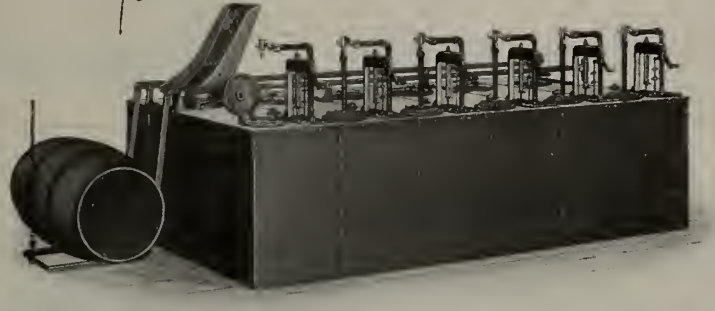
Do you know just how much oil is used and for what purpose? Do you know who obtains oil and in what quantities?

The Bowser Storage System

is self-measuring and metering. It accurately measures the oil and records every drop passing through the pump. It is fitted with a lock so no one can obtain oil except the person authorized.

The oil can be stored underground if desired and delivered in the oil room.

The Bowser all steel roll top cabinet is especially adapted for engine-room purposes. It gives the room a neat and clean appearance, prevents waste, protects the oil from dust and dirt and is fire-proof.



The Bowser System will decrease the oil expense wherever it is installed. Styles to meet all conditions and prices very reasonable.

The Government and hundreds of the largest industries in the world are using Bowser Systems because they pay.

Let us send you bulletins explaining the complete line. Ask for bulletin No 18.

S. F. BOWSER & CO., Inc., Toronto, Ontario

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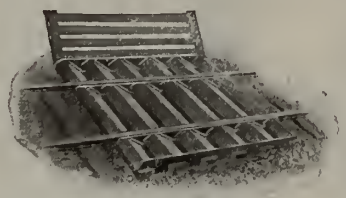
Kalamazoo "PERFECT" Steel Surface Cattle Guard

ONLY GUARD THAT ALWAYS TURNS AWAY ALL STOCK WITHOUT INJURY



Furnished ready-to-place, saving expense of hardwood ties, much excavating and much assembling. Offers no catching points for dragging chains—readily removable during track overhauling—cannot rattle to pieces—proof against corrosion—self-cleansing of snow and rubbish. In short, this is **the perfect guard.**

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Canadian Sales Agent—MUSSENS LTD., MONTREAL

A HISTORY OF THE PAY-AS-YOU-ENTER CAR

AND ITS LESSON

The following cities are using Pay-As-You-Enter Cars: Chicago City Railway, 839 cars; Chicago Railways, 1,328; Public Service Corporation of New Jersey, 466; New York City Railway, 555; Third Avenue Railroad, New York, 550; International Railway, Buffalo, 200; Buffalo & Lake Erie Traction Co., 10; Washington Ry. & Elec. Co., Washington, D.C., 100; Capital Traction Co., Washington, D.C., 51; Municipal Traction Co., Cleveland, Ohio, 180; United Rys. Co. of St. Louis, Missouri, 310; Portland Ry., Lt. & Pwr. Co., Portland, Ore., 25; Columbus Ry. & Lt. Co., Columbus, Ohio, 10; Wichita R.R. & Lt. Co., Wichita, Kan., 14; Jacksonville Elec. Co., Jacksonville, Fla., 5; Dallas Elec. Co., Dallas, Texas, 20; Houston Elec. Co., Houston, Tex., 41; Northern Texas Trac. Co., Ft. Worth, Texas, 25; Ithaca Street Ry., Ithaca, N.Y., 2; Peoria Street Ry., Peoria, Ill., 13; Urbana & Champaign Ry., Champaign, Ill., 3; Mutual Lt. & Water Co., Brunswick, Ga., 4; Rochester Ry. Co., Rochester, N.Y., 25; Ft. Dodge, Des Moines & So. R.R. Co., 2; Muskogee Elec. Trac., Muskogee, Okla., 6; Union Traction Co., Dubuque, Ia., 4; Topeka Ry. Co., Topeka, Kas., 12; United Rys. & Elec. Co., Baltimore, Md., 32; Detroit United Ry., Detroit, Mich., 225; Cincinnati Traction Co., Ohio, 50; Montreal Street Railway, 400; British Columbia Elec. Ry., 30; Calgary Street Railway, 18; Metropolitan Street Ry., Kansas City, Mo., 50; Edmonton Radial Ry., 4; San Antonio Traction Co., San Antonio, Tex., 6; Rockford & Int. Ry., Rockford, Ill.; Cairo Street Ry. & Lt. System, 6; Des Moines City Railway, Iowa, 12; Macon Ry. & Lt. Co., Macon, Ga.; Virginia Ry. & Power Co.; Columbia Elec. St. Ry. & Lt. & Power Co., Columbia, S.C.; Aurora, Elgin & Chicago Ry., Chicago, Ill.; Wichita Falls Traction Co., Wichita Falls, Tex.; Ottawa Electric Ry. Co., Ottawa; Bloomington & Normal Ry. & Lt. Co., Bloomington, Ill.; Corsicana Transit Co., Corsicana, Tex.; Compania Electrica y de Ferrocarriles, Mexico; The Milwaukee Elec. Ry. & Lt. Co., Milwaukee, Wis.; Springfield Street Ry. Co., Springfield, Mass.; Lynchburg Traction Co., Lynchburg, Va.; Chicago & Southern Traction Co., Chicago, Ill.; Calumet & South Chicago Ry. Co., Chicago, Ill.

THE LESSON

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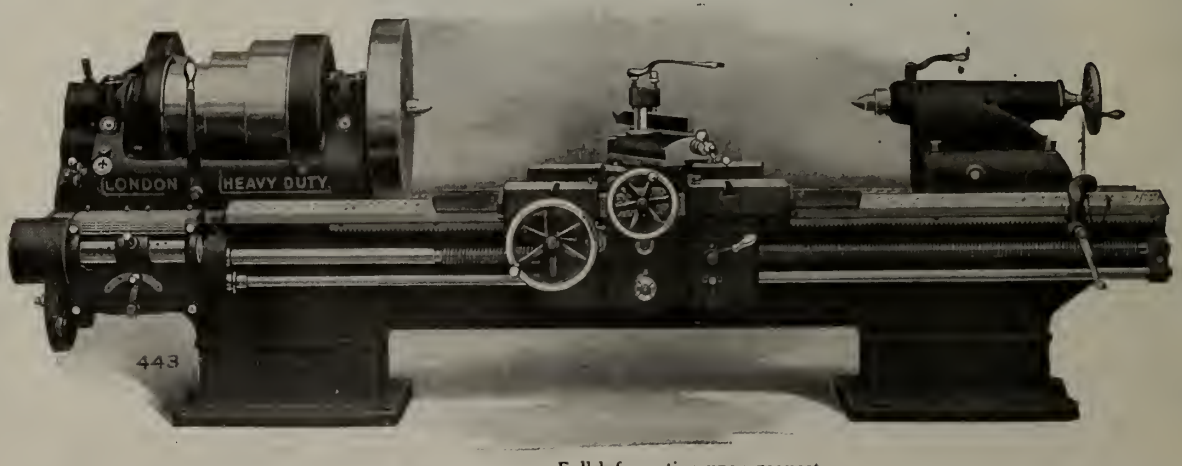

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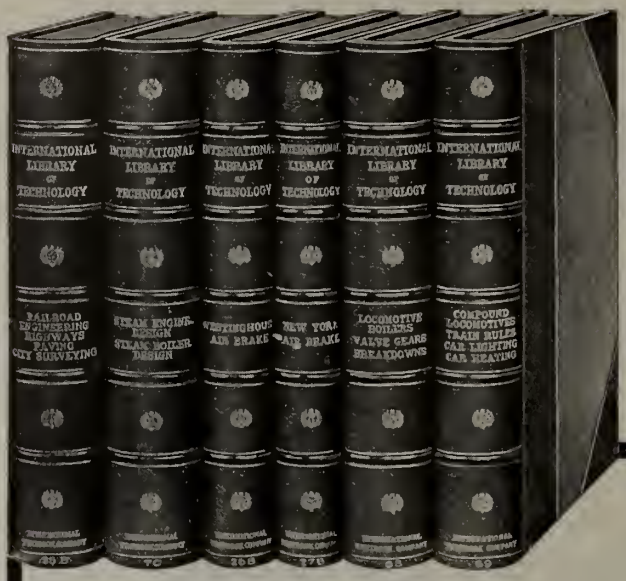

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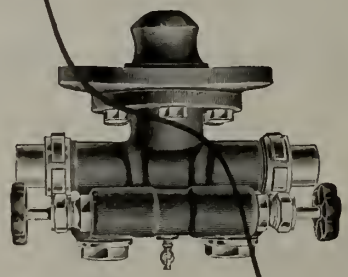

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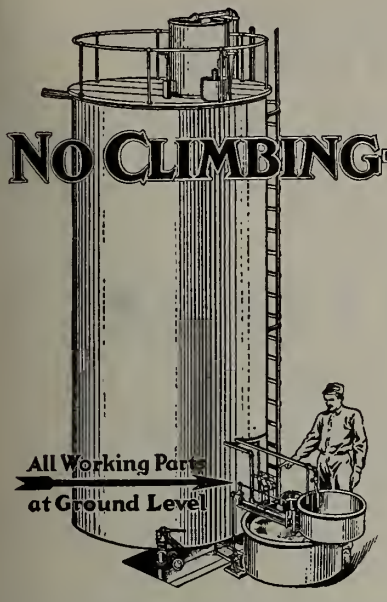

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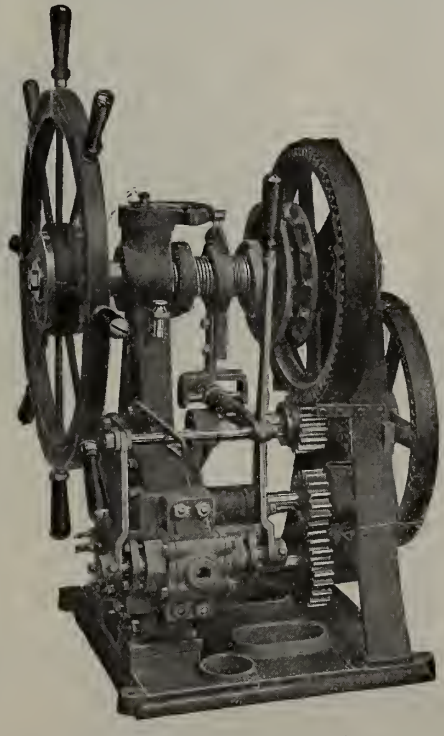

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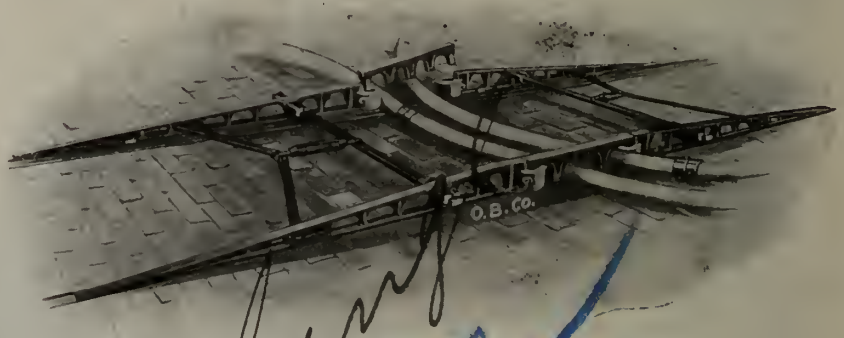

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Dear Mr. Editor,—

Thanks for your kindness in allowing me the privilege of appealing at this Christmas time on behalf of the Hospital for Sick Children, Toronto.

I make this direct appeal to the people of Ontario, for the fathers and mothers of Ontario, outside the City of Toronto, have precisely the same claim for their sick children as regards the privileges of the Hospital, as parents who reside in this city.

In brief the sick children from any place in Ontario whose parents cannot afford to pay, is, on certificate from a municipal officer of any city, town, village or township, treated free.

This is a privilege not granted by any Hospital in the Dominion, or on this Continent.

Let me, in a few words, state that in the last 20 years, since 1891, there have been 4,731 patients from 450 places outside of this city treated free, as the parents were unable to pay for treatment. Last year 384 patients from 234 places outside Toronto were so treated.

The Hospital is not a city but a Provincial institution. The Corporation of Toronto grants $18,000, not only for city children, but towards the maintenance of every patient in the Hospital, and the citizens of Toronto donate an average of $10,000 to the maintenance fund of the Hospital.

It would take more space than you can spare to tell of the good work done for the sick and deformed children of this Province.

Why, in the Orthopedic department in 20 years, nearly 700 children, boys and girls, have been treated for club feet, and about 600 were corrected. Two-thirds of these came from places outside of Toronto, from parents who could not afford to pay.

Surely we have a fair claim for help from the people of this Province.

Every day is Christmas to the child whose little life is saved, or whose crippled limb is straightened with the might of money—your money—and the mercy of the Hospital.

Will you, the reader of this letter, think of what your dollar will do? It helps to restore health and strength, and gives sound limbs and straight feet to crippled boys and girls.

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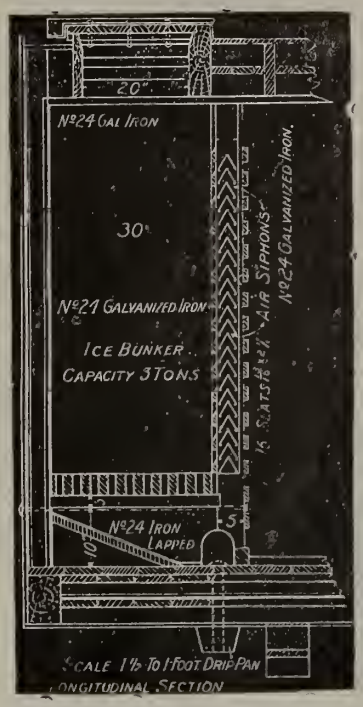

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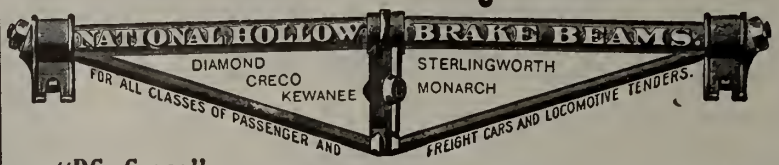

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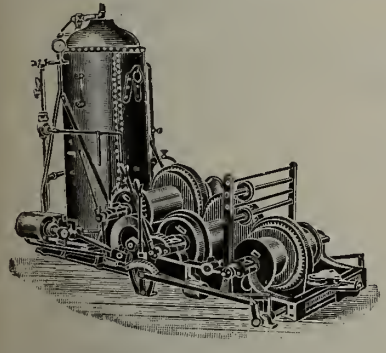

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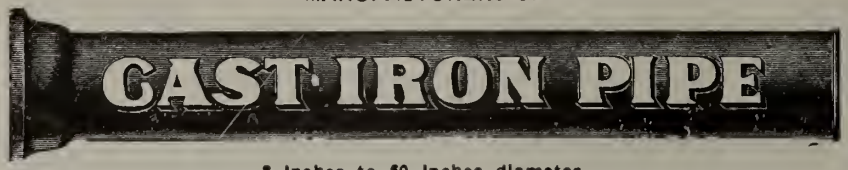

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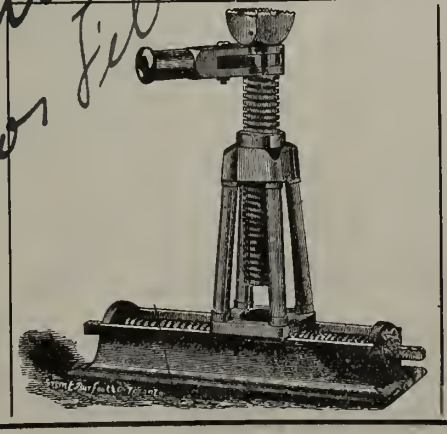

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Notice is hereby given that a dividend of four per cent. (being at the rate of eight per cent. for the year) has been declared upon the capital stock of this Company, and the same will be payable on the 2nd of January, 1912.

The transfer books will be closed from the 15th of December to the 31st of December, 1911, both days inclusive.

The annual meeting of the shareholders will be held Tuesday, the 9th day of January, 1912, at 12 o'clock noon, in the Board Room, Traders Bank Building, Toronto.

By order of the Board.

B. W. FOLGER, General Manager.

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NOTICE.—The Canadian Pacific Railway Company will apply to the Parliament of Canada, at its present session, for an Act authorizing it to construct a railway from a point at or near Sedgewick, on its Hardisty Subdivision, in a southerly direction to a point in Township 40 or 41, Range 12 or 13, west 4th M., in the Province of Alberta, and for other purposes.

Dated at Montreal, this 21st November, 1911.

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Secretary.

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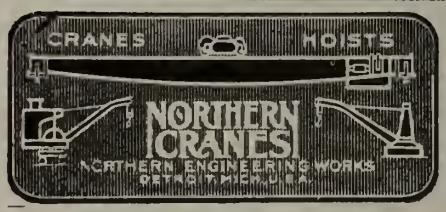

CANADIAN PACIFIC RAILWAY CO.

Issue of New Ordinary Capital Stock.

NOTICE is hereby given that, pursuant to Resolution passed at the Special General Meeting of Shareholders on 7th October, 1908, an issue of $18,000,000 additional Ordinary Capital Stock of the Company, or 180,000 shares of $100 each, has been ordered by the Board of Directors.

The said Stock will be offered to the Shareholders of record at 3 p.m. on Tuesday, the 2nd day of January, 1912, at the price of one hundred and fifty dollars per share, being at a premium of Fifty per cent. over and above the par value thereof, on the basis of 10 per cent. or one share in ten of their respective holdings.

The right to subscribe will expire at 3 p.m. on Tuesday, 13th February, 1912.

Payments will be received at the Bank of Montreal, London, New York, or Montreal, as follows:—

20%, or $30 per share on subscription on or before 13th February, 1912.
20%, or $30 per share on 12th April, 1912.
20%, or $30 per share on 14th June, 1912.
20%, or $30 per share on 16th August, 1912.
20%, or $30 per share on 18th October, 1912.

Interest at the rate of 7% per annum will be paid in October, 1912, from the due date of each instalment to September 30th, 1912, on instalments up to and including that of 16th August, 1912, which have been paid on or before due dates.

All shares of the issue on which instalments have been paid in full on the due dates will rank with the existing stock for the full dividend accruing for the quarter ending 31st December, 1912.

A circular containing the terms of subscription and payment, and enclosing warrants of subscription, will be mailed to the Shareholders on or about the 15th day of January, 1912.

By order of the Board,
W. R. BAKER,
Secretary.
Dated at Montreal, 13th December, 1911.

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McCord & Co. .....Chicago, Ill.
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Polson Iron Works, Ltd. .....Toronto.
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Corbet Fdry. Co., Ltd. ..Owen Sound, Ont.
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Commercial Acetylene Co. .....Toronto.
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Butterfield & Co. .....Rock Island, Que.
A. B. Jardine & Co. .....Hespeler, Ont.
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Northern Electric & Mfg. Co.....Montreal.
Telegraph and Telephone Office Signs
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Goldschmidt Thermit Co .....Toronto.
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Vol. 15, No. 168 TORONTO, CANADA, FEBRUARY, 1912.

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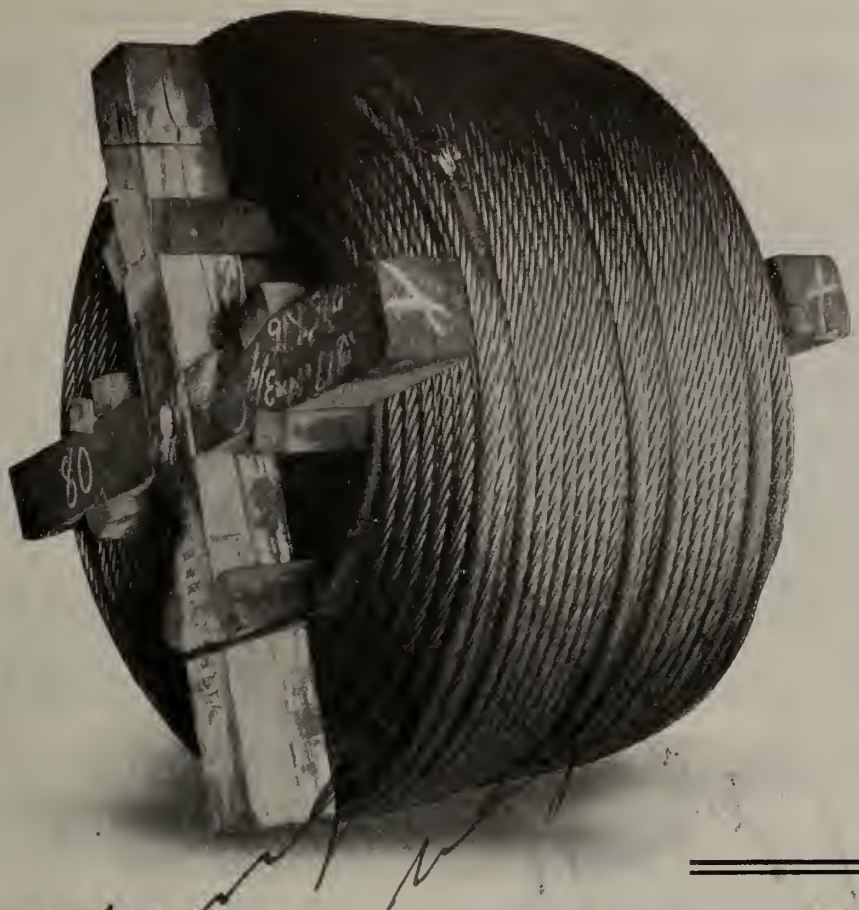

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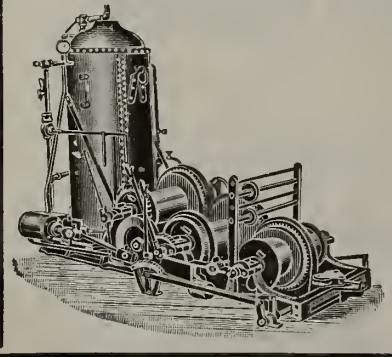

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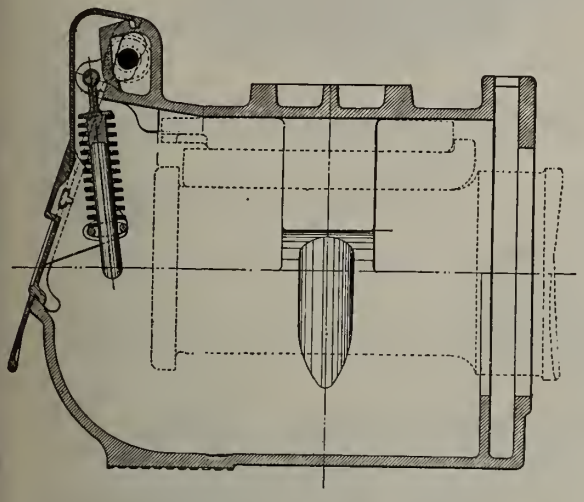

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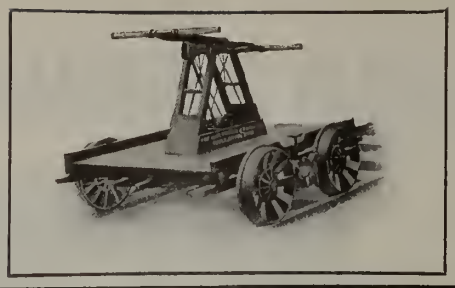

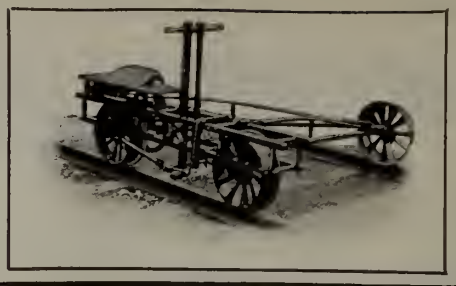

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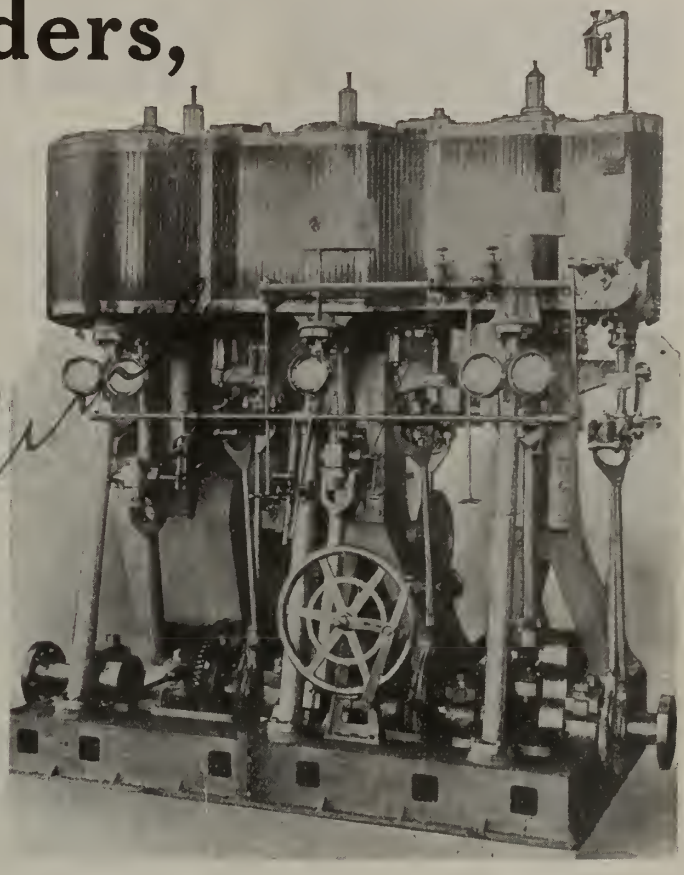

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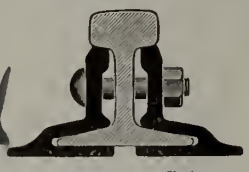
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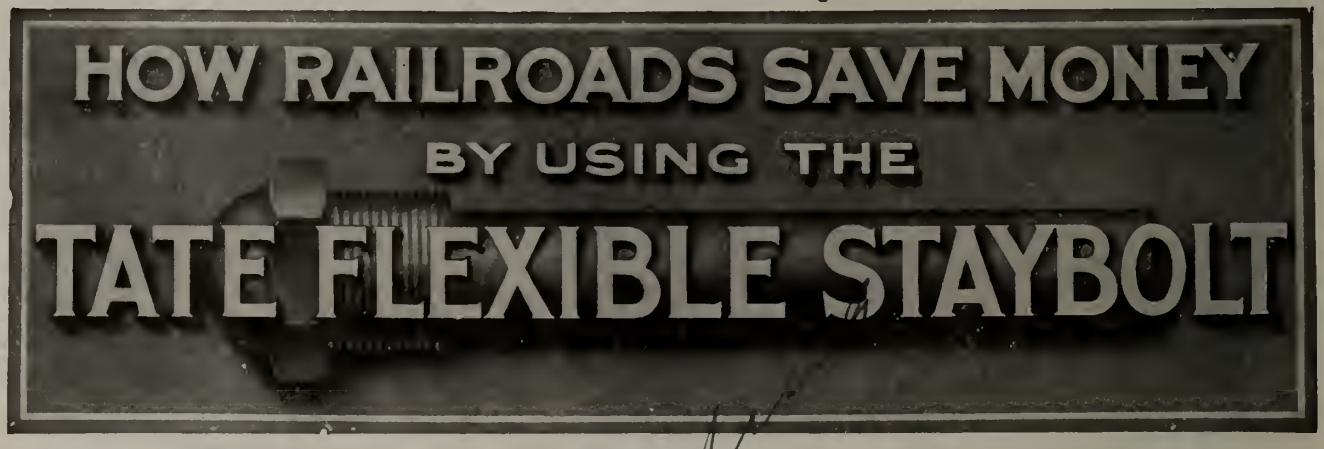

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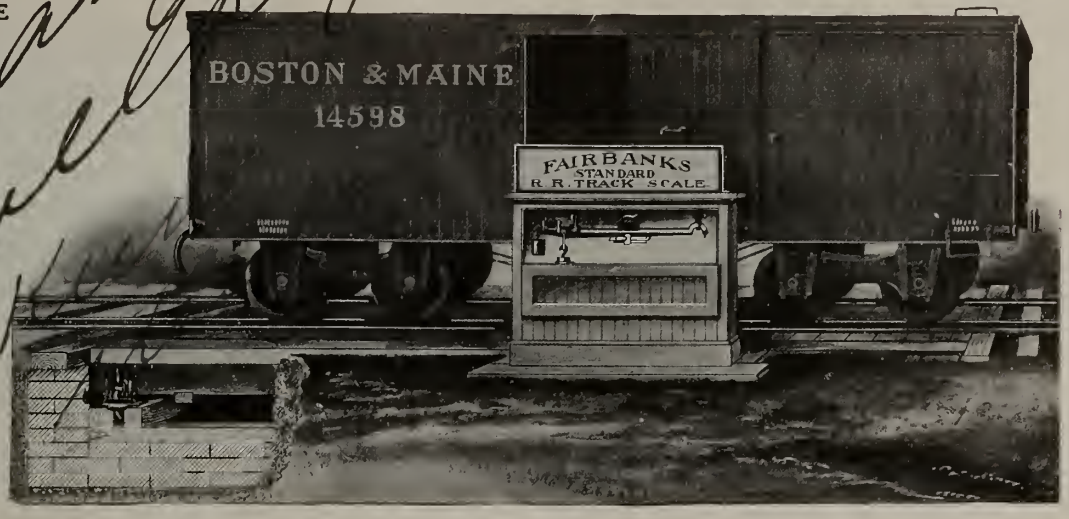

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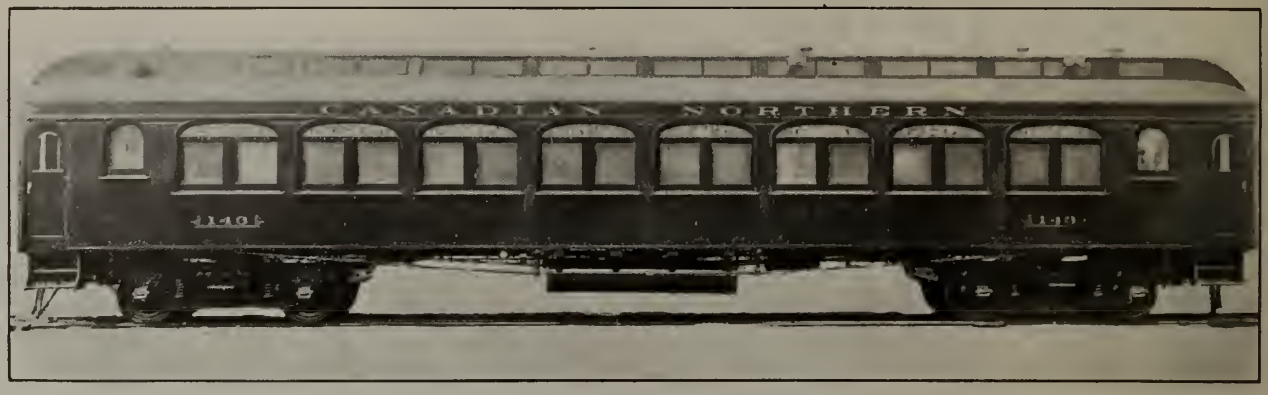

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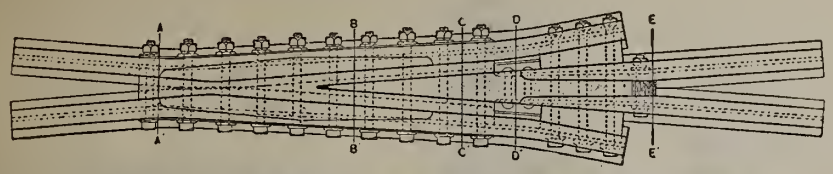

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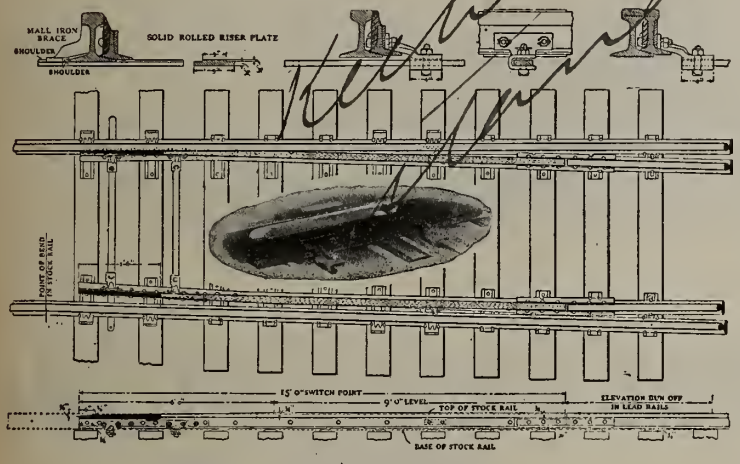

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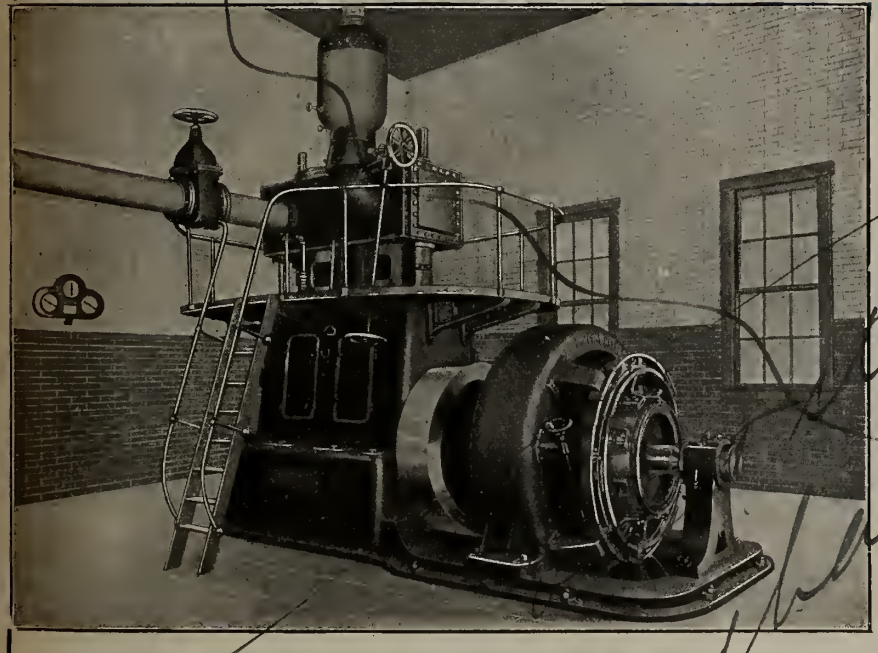

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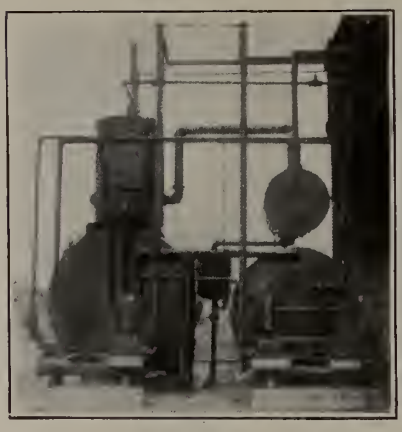

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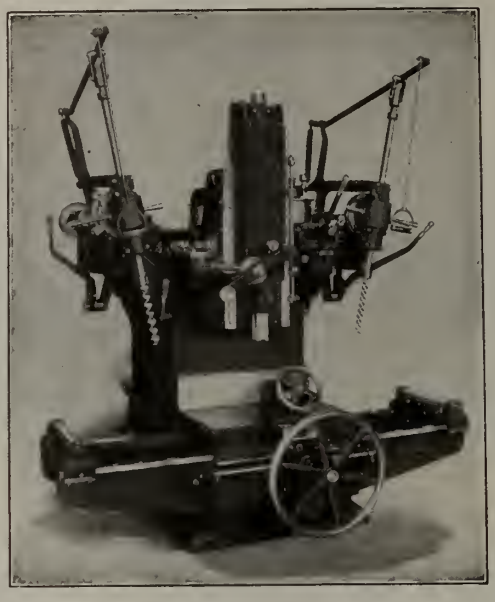

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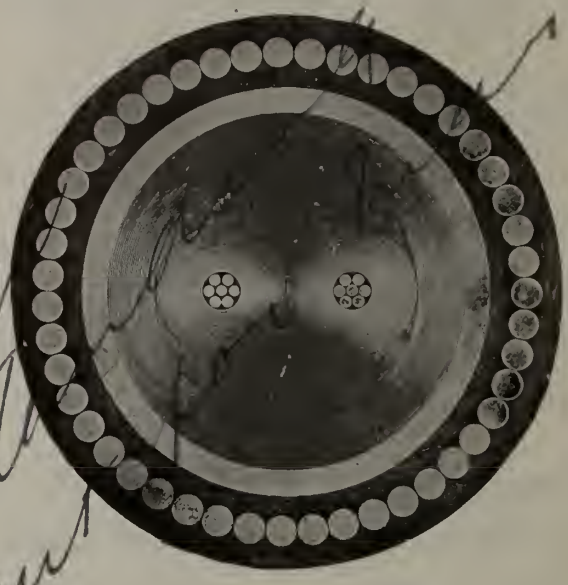

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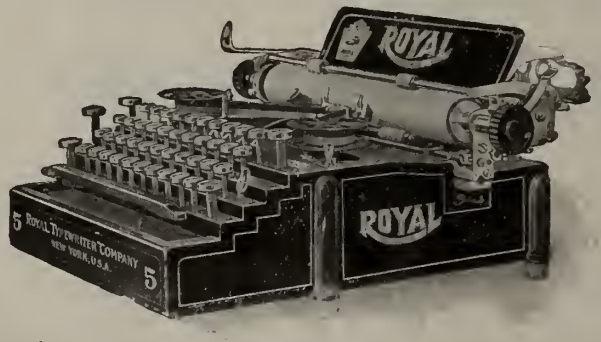

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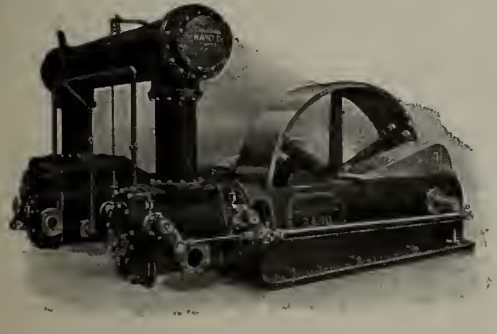

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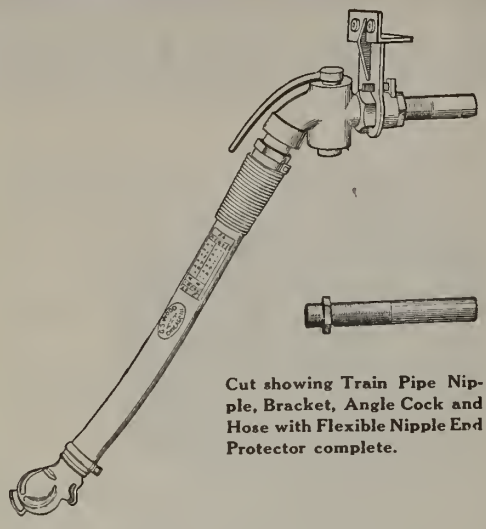

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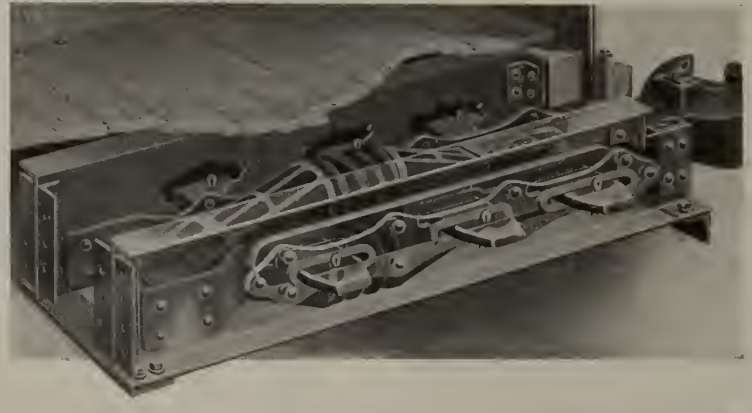

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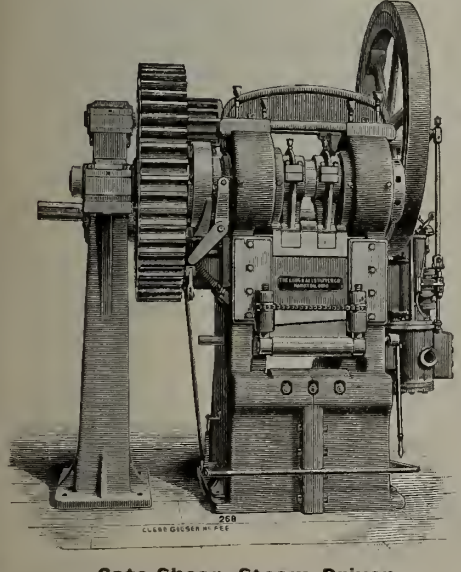

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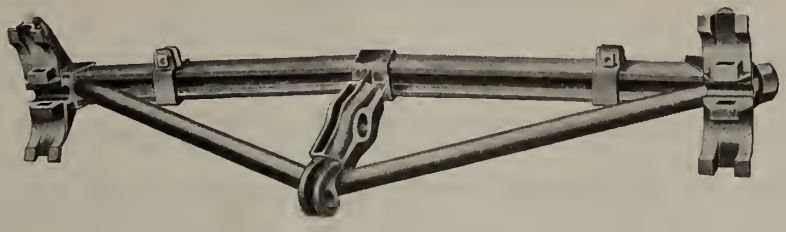

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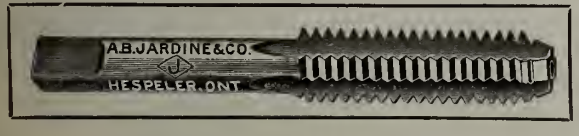

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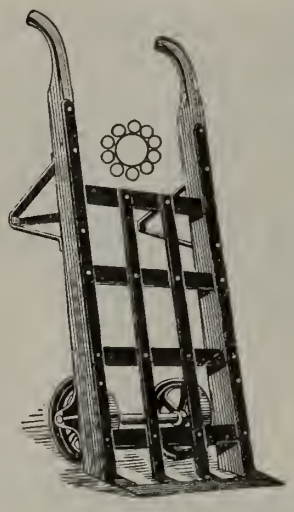

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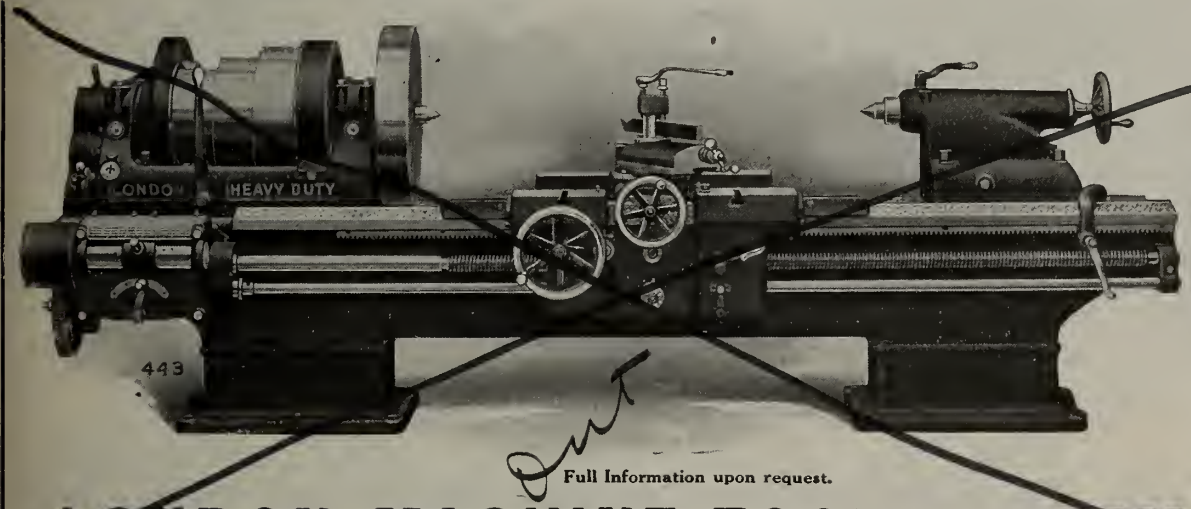

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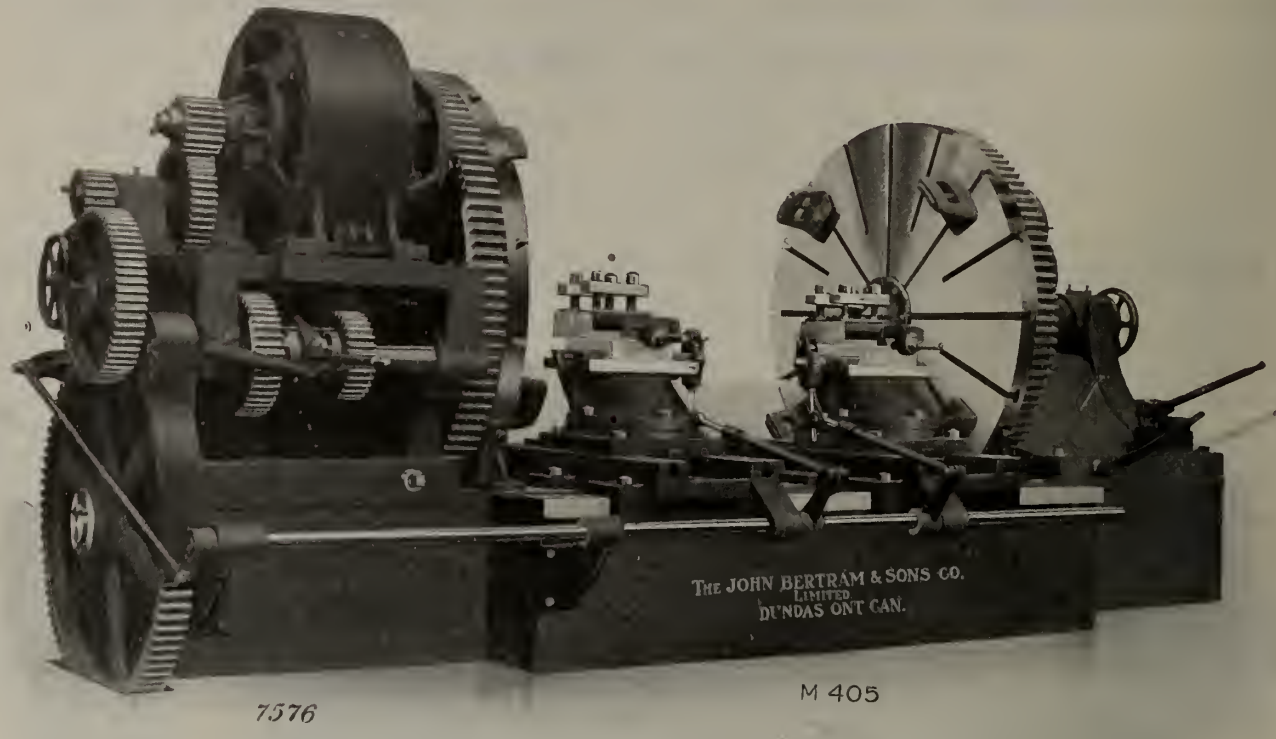

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The Railway and Marine World

February, 1912.

The National Transcontinental Railway Shops at Transcona.

Progress in the construction of the N.T.R. shops at Transcona has been noted in The Railway and Marine World as the work advanced. These descriptions in the various stages of completion were published in Aug., 1909, Aug. and Sept., 1910, and July, 1911. A number of changes, some of which involved considerable rearrangement, have from time to time been made so that the completed scheme, more particularly as it relates to the car department, is materially different from that at first outlined. In view of these changes, and the fact that the shops are now nearing completion, a complete illustrated article describing them in detail has been prepared.

These shops, located at Transcona, some six miles east of Winnipeg, on the chanical Engineer and Machinery Expert, and has since then had entire control of the completion of the locomotive shops and construction of the car shops, together with the selection and location of machinery and equipment placed in the locomotive shops, and to be placed in the car shops, and also of all mechanical equipment along the N.T.R. line. D. A. Evans, who is one of his assistants at Winnipeg, has done very good work in connection with the locomotive shop plant.

As above stated, the original purpose of the shops is to provide for repairs for the N.T.R. east of Winnipeg, which line on completion will be operated by the Grand Trunk Pacific Ry. Co. They will also be used for repairs for G.T.P.R. lines west of Winnipeg, though later on would be capable of a further extension of 100% when traffic conditions should require it.

The various buildings are arranged along a midway running north and south across the property, and are served by a series of standard gauge and industrial tracks. The standard gauges branch off from the yard tracks to the south of the property. Additional communication between the buildings is obtained through the overhead travelling crane shown in fig. 1, which runs the whole length of the midway, serving all the main shops. This crane has 10 tons capacity, and is electrically operated, all exposed parts being covered by hoods in the usual manner. The operator's cage is electrically heated with a heater of the street car type. The runway is of

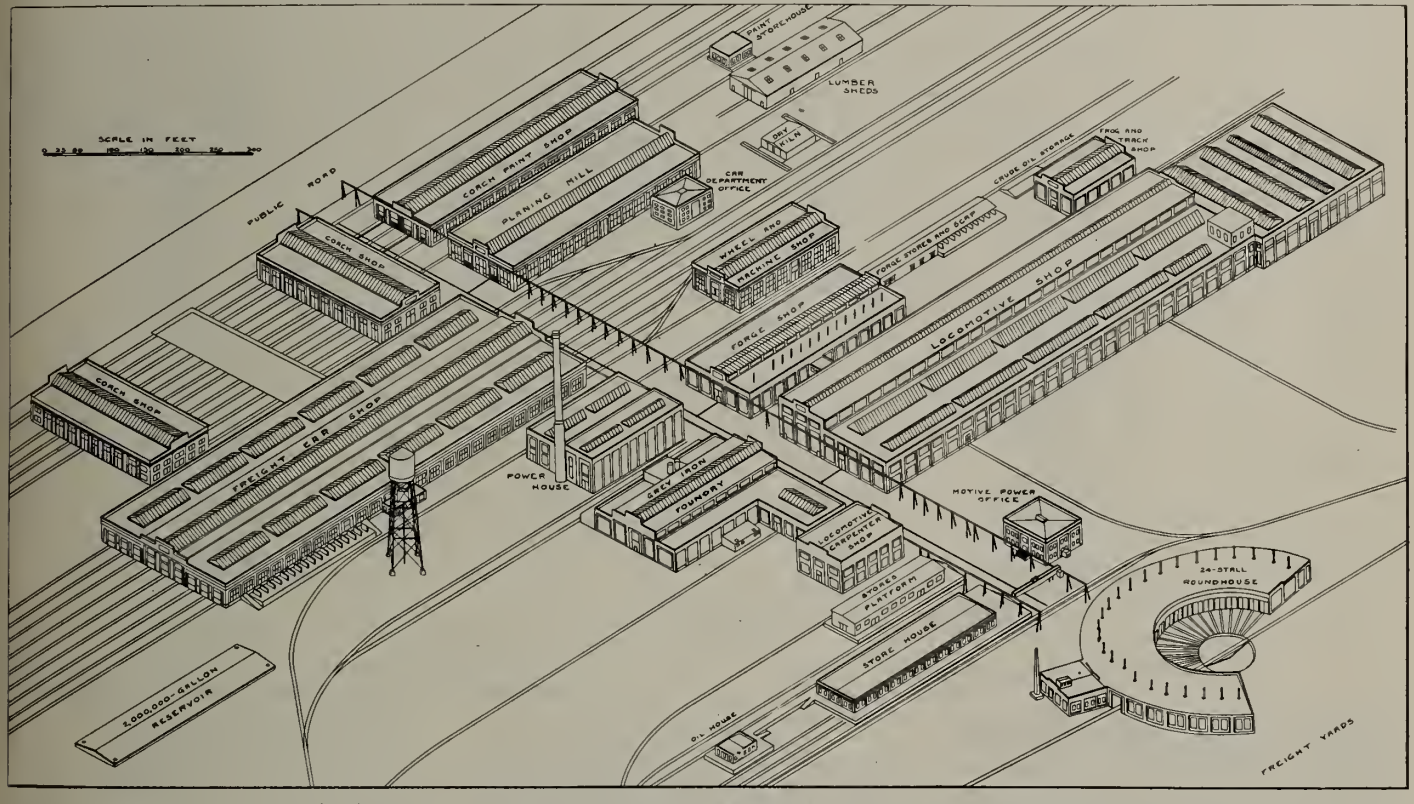

Fig. 1. Isometric Projection of Locomotive and Car Departments. (Copyright.)

N.T.R. main line, are intended to look after the general repairs of 1,800 miles of road, and have been designed with that object in view. In conjunction with the shops to be constructed at Quebec, the whole line from Winnipeg east to Moncton, will be provided for. An idea of their extent may be gained from fig. 1, an isometric scale projection of the shops. It is said that next to the C.P.R. Angus shops at Montreal, they will be the largest in Canada.

The details of the locomotive shop plant were partially developed and constructed under the supervision of F. W. Walker, M.E., Superintendent of Terminal Shops, N.T.R., who, however, resigned on July 1, 1911. W. J. Press, M.E., was, in May, 1910, appointed Me- it will no doubt become necessary for the G.T.P.R. to build shops in the west, as the C.P.R. is about to do at Calgary.

The site chosen is the prairie, and in order to avoid any trouble from flooding during the spring freshets, the floor level of the shops has been raised about 4 ft. above that of the existing prairie by a heavy gravel fill over the whole area occupied by the buildings.

The various buildings have been grouped together as closely as possible to facilitate intercommunication during the severe winter, the intervening distances being made as short as possible. As will be noted from fig. 1, this feature has been carried out very successfully, considering the fact that the designers had in mind the building of a plant that steel construction, the steel columns supporting the girders being carried on concrete piers. Wherever possible, this runway is made a part of the adjoining building, dispensing with columns at these points.

As indicated in fig. 1, the car shops are to the north, and the locomotive shops to the south, the midway passing through each group of buildings. The divisional line is the through track running to the north of the power house, the latter being as centrally located as is feasible to reduce power and heat transmission losses to a minimum. The foundry and forge shops, being used by both departments are also centrally located between the groupings, the buildings that are distinctively car or loco-

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motive being at the north and south ends of the midway respectively.

The buildings, with the exception of the storehouse, oil house and stores platform, are of steel construction with self-supporting steel frames, with concrete foundations and walls up to the windows. The balance of the superstructure masonry is brick, carried up into a parapet wall all around the building, and capped with a concrete coping. The roof drainage is carried down inside the buildings from receiving hoppers in the roof and through running traps to the sewers. All the large buildings are covered with a built-up roofing composed of felt and asphalt covered with gravel. All windows throughout the plant have ⅛-in. thick ribbed glass, and the skylights are glazed with ⅜-in. wire glass. As additional protection against heavy snow loads on the roof, the skylights are carried on steel ribs with rolled copper sheathing to carry the glass. Copper is used throughout for all flushing gutters and ventilators. The completed shops will have a total floor space of a little over 17 acres.

Mercury arc lights are being used for the principal interior shop illumination, with the lamps and reflectors hung high in the shop. This form of illumination is satisfactory, giving an easy, even light with no sharp shadows. In addition, there will be plug receptacles in all the buildings at frequent intervals for the attachment of lamps on cables for the illumination of boiler interiors and similarly hampered places. Daylight illumination is specially well provided for by ample window areas and wide skylights, giving the maximum of light. The steel-construction makes this possible. To utilize this lighting to the greatest advantage, the interiors of all the shops are painted white, so that the lighting is particularly good.

High and low pressure steam, water, compressed air and drinking water, are distributed throughout the various buildings with numerous outlets. The piping distribution system is carried up and down the midway from the power house in a tunnel of sufficient size to permit a passage alongside the pipes, and branches to the various buildings are run from this tunnel in tile conduits packed with asbestos sponge. On entering the building, the piping is carried on the trusses and steel work of the shop. Fuel oil is distributed under pressure from the storage tanks to the furnaces in the boiler, locomotive and forge shops, while an accumulator gives the necessary pressure for the operation of the various hydraulic machines.

The shops are protected from fire by an extensive system of yard piping and fire hydrants, with hose houses at convenient spots. The electric travelling cranes throughout the plant are equipped with alternating-current motors, and are operated directly from the 3-phase circuits from the power house.

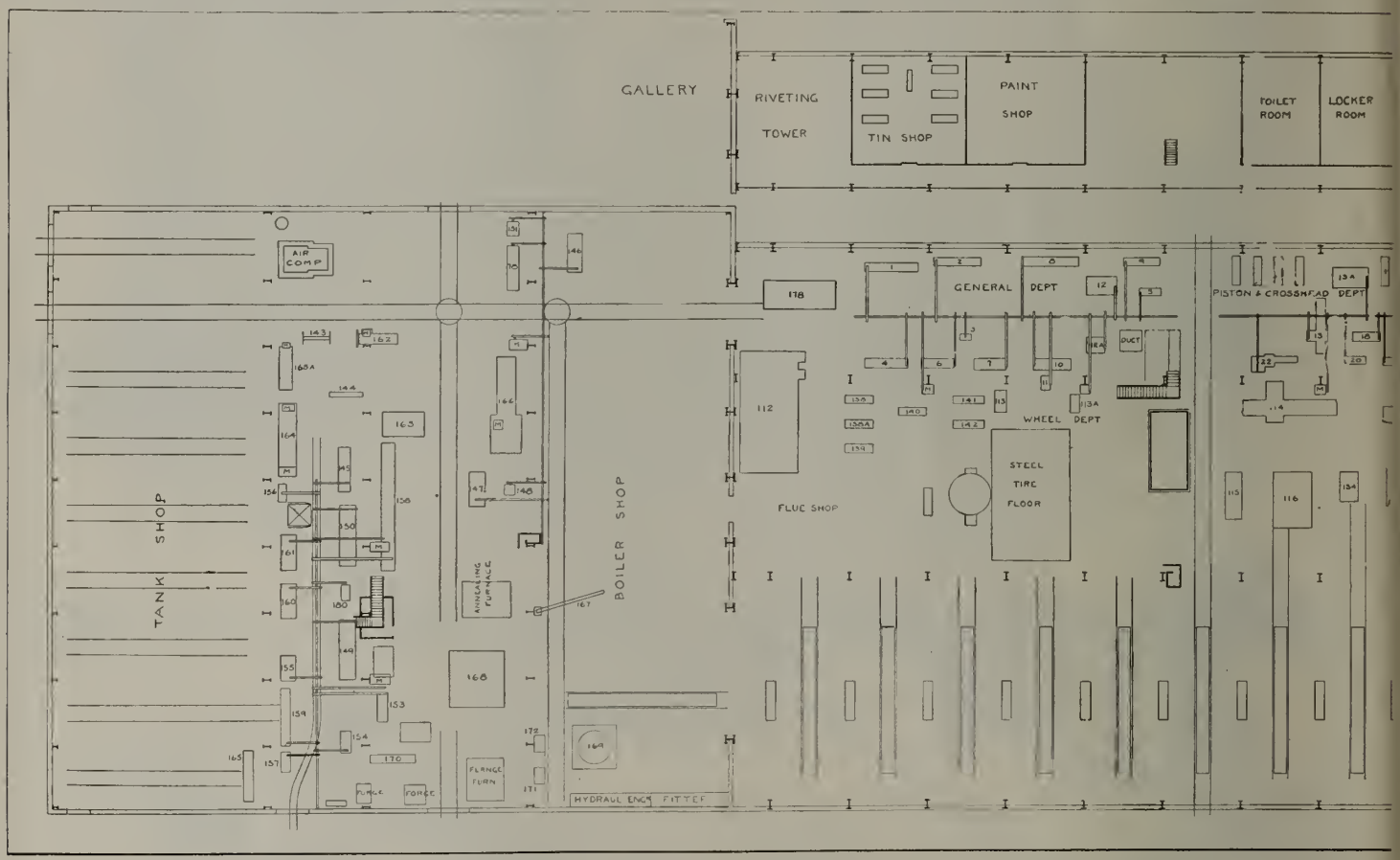


Fig. 2. Plan of Locomotive Machine Shop and Gallery, and

Locomotive Department.

THE LOCOMOTIVE, MACHINE AND ERECTING Shop, a plan view of which is given in the double-page illustration, fig. 2, is 615 ft. long, containing three bays. The main bay, which is 70 ft. wide, with a height to bottom of truss chord of 50 ft., is the section shown in the lower part of the illustration. It contains 25 locomotive pits. There are two entrances to these pits, at the sixth pit from each end. The locomotive, when entered, is picked up by a 120-ton electric crane which spans the 70-ft. bay, carrying the locomotive to the desired berth. This arrangement has certain advantages over the transfer table, and long track erecting floor layouts. A 10-ton electric crane of similar span used for general work, handles the majority of the parts.

Each pit is replete with plug connections for electric light cables for dark

138A Pipe machine.
139 Flue expander.
140 Flue welder and swedger.
141 Hot saw and expander.
142 Cut-off machine.
Staybolt nipper.
Pneumatic staybolt breaker.

The stationary machines of this lot are in a group drive, with the exception of 112, which has an individual motor. (Motor drive will hereafter be designated by "m.d.," unless otherwise noted).

The wheel department, which is next in order in this bay, is provided with all the necessary equipment, including the following machines:

113 32-in. Draw-cut shaper with crane.
113A 12-in. Slotter.

There is also a large steel tire floor centrally located, with a lye vat of sufficient size that driving wheels, side rods, and similar parts may be completely immersed for cleaning off the grease.

The next span is a 60-ft. bay containing all the heavier individual motor-driven machine tools where the bulkier and heaviest parts are handled. This is provided for by two 10-ton cranes for the handling of materials.

At the extreme left of this bay the flue shop is located adjoining the boiler shop contained in an extension to the locomotive shop, and which will be later described. The equipment of this shop is thorough, containing the following machines. (The first column refers to the index number on the illustration by which the machine can be located):

112 Chain rumbler with cleaning chain attachment.
138 Cold cutting-off machine.

Next in order comes the wheel department. In this section there are the following motor-driven tools:

114 60-in. Planer.
115 24-in. Slotter.
116 96-in. Boring mill.
117 Extension gap lathe.
119 600-ton Hydraulic wheel press.
120 90-in. Driving wheel lathe.
121 85-in. Quartering machine.
122 80-in. Wheel lathe.
134 60-in. Radial drill.

To the right of this section comes the balance of the heavy motor-driven machines, classed as a general department, with the following machine tools:

125 60-in. Planer.
126 60-in. Planer.
128 26-in. Draw cut shaper with crane.
129 30-in. Draw cut shaper with crane.
130 72-in. Vertical boring mill.
131 42-in. Vertical boring mill.
5 14-in. Bolt lathe.
6 16-in. Shaper.
7 60-in. Radial drill.
8 32-in. Engine lathe.
9 30-in. Engine lathe.
10 Horizontal boring mill.
11 50-ton Forcing press.
12 52-in. Vertical boring machine.
12A 42-in. Vertical boring machine.

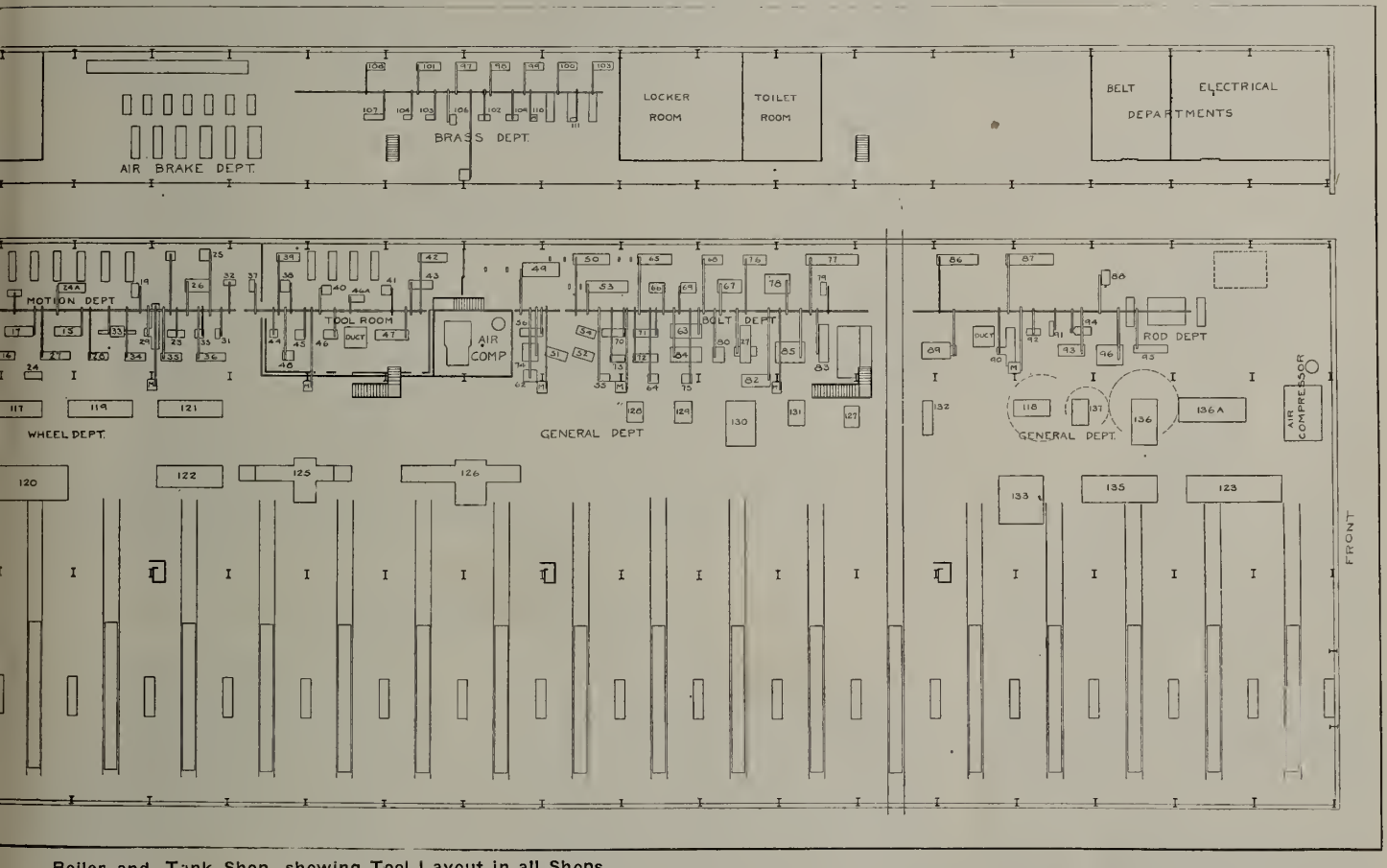
The piston, crosshead and motion department, which comes next in order, is very complete with a wide range of standard tools for this class of work. The 26 machines in this set have group drive divided into two sections with the heavier machines at the left end of the section in one drive. The complete list is as follows:

13 36-in. Planer.
13A Piston grinder.
14 Double emery wheel.
15 36-in. Radial drill.
16 16-in. Bolt lathe with taper attachment.
17 66-in. Radial drill.
36 18-in. Engine lathe with taper attachments.

Alongside this section is the tool room in a closed partition. It has the usual tool room equipment for a shop of this size, as follows:

37 Grindstone.
38 16-in. Universal shaper.
39 14-in. Tool lothe with taper and relieving attachments.
40 6-spdle Drill.
41 2-spdle Drill.
42 18-in. Tool lathe with taper attachments.
43 14-in. Tool lathe with taper attachment and draw-in collets.
44 Twist drill grinder.
45 Reamer grinder with attachments.
46 Tool grinder.
46A 12-in. Speed lathe.
47 22-in. Engine lathe with taper attachments.
48 Milling machine.

An air compressor, electrically operated, in a compartment alongside the



Boiler and Tank Shop, showing Tool Layout in all Shops.

127 Combined milling machine.
132 18-in. Slotter.
118 6-ft. Radial drill.
137 26-in. Draw cut shaper with crane.
136 18-in. Vertical miller.
136A Locomotive rod boring machine.
133 60-in. Draw cut cylinder planer.
135 Special cylinder borer.
123 36 x 36-in. Milling machine.

Along the north side of the shop there is a third bay 40 ft. wide, extending the full length, with a gallery overhead. On the ground floor under the gallery the lighter group-driven machinery is placed as will be described. Commencing at the left, omitting for the present 178, a hydraulic rivetter, there is first of all a general department consisting of the following smaller machine tools, belted to a jackshaft driven from two motors:

1 26-in. Engine lathe.
2 28-in. Engine lathe.
3 Double emery grinder.
4 26-in., 12-ft. Bed engine lathe.
18 48-in. Radial drill.
19 50-ton Forcing press.
20 16-in. Engine lathe with taper attachment.
21 Centreing machine.
22 Milling machine.
23 18-in. Emery grinder.
24 Disc grinder.
24A Link grinder.
25 16-in. Traverse shaper.
26 10-in. Slotter.
27 20-in. Engine lathe with taper attachment.
28 16-in. Engine lathe with taper attachment.
29 20-in. Planer.
30 14-in. Drill.
31 4-in. Hack saw.
32 Buffing machine.
33 Universal grinder with all attachments.
34 16-in. Engine lathe with taper attachments.
35 16-in. Engine lathe with taper attachments.

tool room, in conjunction with the air compressor at the right hand end of the middle bay, supplies all the air required in this shop, thus making it independent of the central plant air compressor in the powerhouse. Moreover, standing connections are provided, connected with the general air distribution for use in case of emergency.

Just past the tool and air compressor rooms is the bolt department, equipped with the machines enumerated:

49 3-in. x 36-in. Hollow hex. turret lathe.

operates under the large crane, and is

50 3-in. x 36-in. Hollow hex. turret lathe.
51 4-in. Hack saw.
52 4-in. Hack saw.
53 2-in. x 24-in. Hollow hex turret lathe.
54 Automatic lathe.
55 Centering machine.
56 14-in. Bolt lathe with taper attachment.

57 Automatic screw machine.
58 Automatic screw machine.
62 Emery wheel.
63 2-spdle. Drill.
64 6-spdle. Drill.
65 Hollow hexagon nut facer.
66 Nut facer with complete attachments.
67 2-in. Bolt cutter.
68 1½-in. Screw machine.
69 2-in. 4-spdle. Nut tapper.
70 14-in. Bolt lathe with taper attachments.
71 16-in. Bolt lathe with taper attachments.
72 16-in. Bolt lathe with taper attachment.
75 6-spdle. Drill.
76 16-in. Engine lathe.
73 Centering machine.
74 1½-in. Triple head bolt cutter.
77 30-in. Engine lathe with taper attachment.
78 2-in. Triple head bolt cutter.
78A 6-spdle. Staybolt threader.
79 Grindstone.
80 16-in. Shaper.
81 27-in. Planer.
82 20-in. Engine lathe with taper attachment.
83 27-in. Planer.
84 2-in. Spindle drill.
85 36-in. Vertical boring machine.

At the front end of the shop is located the rod department with tools as follows:

86 32-54-in. Engine lathe with taper attachment.
87 36-in. Engine lathe.
88 30-ton Forcing press.
89 48-in. Radial drill.
90 Guide bar grinder.
91 Grindstone.
92 Double emery grinder.
93 36-in. Boring mill, turret attachment.
94 32-in. Drill.
95 20-in. Engine lathe with taper attachment.
96 37-in. Boring mill.

Coming next to the gallery, which extends the full length to the shop over the 40-ft. bay, it is here that the departments with lightest machinery, etc., are located. From the left the first compartment is the tin shop, which is very fully equipped with the best tin shop appliances, including formers, folders, shears, groovers, turners, burrers, etc. Alongside this room is the paint shop for the storage of paint for the locomotive department.

Proceeding along the gallery, the next room passed is the lavatory, equipped with the latest and best in shop lavatory utensils. The locker room adjoining contains double tiers of 12 x 12 x 42 sheet steel lockers with expanded metal doors.

Next in order is the air brake department, where all the air brake apparatus is to be tested and repaired. It is fitted out with the usual standard testing devices with the necessary tables and stands as shown.

The brass department, which comes next, contains a series of brass working tools working from an electric group drive. These machines are as follows:

97 18-in. Engine lathe.
98 18-in. Monitor geared head lathe.
99 18-in. Monitor geared head lathe.
100 18-in. Monitor geared head lathe.
101 18-in. Geared head lathe.
102 2-in. Spindle miller.
103 18-in. Monitor lathe with taper attachments.
104 24-in. Radial drill.
105 Turret drill.
106 14-in. Crank-driven shaper.
107 18-in. Engine lathe with taper attachment.
108 16-in. Monitor lathe with taper attachment.
109 Buffing machine.
110 Cock grinder.
111 Bench grinder.

Next to this brass department is a similar set of locker and toilet rooms to those just described. In the corner at the front of the building are the belt and electrical departments.

In addition to the toilet rooms provided in the gallery, there are four urinal stands located at uniform distances down the shop at the columns forming the dividing line between the erecting and electrical departments.

Indirect heating apparatus is installed in the building of sufficient capacity to keep all parts of the shop at a temperature of 60 degs. F. when the outside temperature stands at 20 below zero. Exhaust steam from the powerhouse and the exhaust of the circulating fans is supplied to the heating coils, and the air drawn through these coils is driven by fans through the underground concrete ducts and delivered into the building at floor level through outlets along both walls under the windows.

The flooring of the ground part consists of 3-in. wooden planking spiked to sleepers bedded in bituminous concrete. The gallery floor is of concrete.

THE BOILER AND TANK SHOP is located at the extreme rear end of the locomotive shop, as shown at the left of fig. 2. This shop, 180 ft. in length, has four bays, 60, 50, 30 and 65 ft. wide respectively, running at right angles to the locomotive shop bays. The height of the shop is 36 ft. from the floor to the bottom chord of the roof truss.

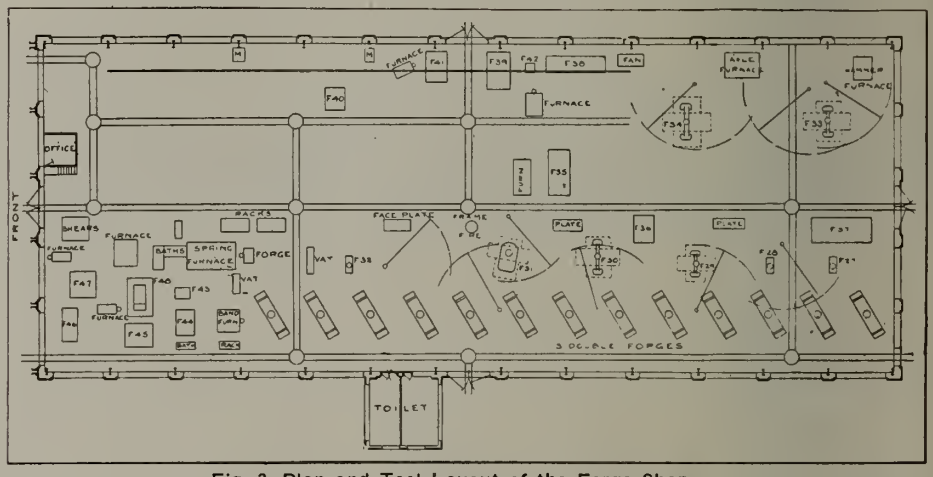


Fig. 3. Plan and Tool Layout of the Forge Shop.

The 60-ft. bay, adjoining the locomotive shop, is for general boiler work for erection purposes. It is served by a 30-ton travelling crane running the length of this bay. At the north end in the end of the locomotive shop through a large opening, located in the usual tower, there is a 17-ft. 6-in. gap rivetter, 178, served by a 20-ton electric crane. This tower is served from the boiler shop by a service track for the transferring of the boilers. At the lower end of the boiler shop bay there is a testing pit, and alongside a 12-in. by 15-ft. hydraulic accumulator, 169. Along the wall are the hydraulic engineers' and fitters' benches.

The second bay, 50 ft. wide, is devoted to heavy machinery and is served by a 10-ton electric crane for the handling of the material. The machine equipment of this bay is as follows:

170 12-ft. Flange clamp.
172 Triplex 3 x 8 hydraulic pump (m.d.)
167 Wall radial drill (m.d.)
168 560-ton, 4-col. Hydraulic forging press.
147 Punch and shear.
148 Grinder.
166 14-ft. Horizontal bending rolls (m.d.)
158 25-ft. Plate planer.
160 61-in. Throat horiz. hydraulic punch.
162 Single end punch and shear (m.d.)
78 2-in. Triple head bolt cutter.
146 4-spdle. Drill.
151 4-spdle. Drill.

In addition to these, there are the forges, flange fire and annealing furnace indicated. All power-driven machines are group drive except where otherwise noted. Like the last bay, there is a standard gauge track running its length with end turntable to transfer to the through track.

The third or 30-ft. bay contains all the lighter machinery, most of which is operated in a group drive. The machines are:

165 200-ton Hydraulic wheel press (m.d.)
157 24-in. Drill press.
154 Small punch.
159 80-in. Rod drill.
153 48-in. Rod drill.
155 12-in. Slotter.
149 Axle lathe with crane.
160 36-in. Car wheel boring machine.
180 2-spdle. Drill.
161 36-in. Car wheel boring machine.
150 Axle lathe.
156 Double emery grinder.
145 7-ft. Belt-driven bending rolls.
164 42-in. Car wheel lathe (m.d.)
165A Car box borer (m.d.)
144 8-ft. Hand lever flanging clamp.
143 6-in. Hand rolls.

This bay has a gallery extending 100 ft. over it up to which the stairs indicated lead. This gallery contains the indirect heating plant for the building, and in addition the locker and toilet rooms. The balance or open section of the bay is served by a 5-ton electric travelling crane.

The rear or 65-ft. bay houses the tank shop stands, where 9 tracks are provided for tender tank repairs. A 20-ton crane spans this bay and handles the necessary materials.

This building is also heated by indirect radiation, a system of ducts and outlets similar to those in the locomotive shop being used. A 3-in. wood floor of similar construction is also used throughout. In the light-machine bay there is also a motor-driven air compressor, making this shop equally independent of the powerhouse for its compressed air supply. Standby connection is also made with the locomotive shop line.

One characteristic particularly noticeable in this shop is the convenient layout of the tools in such a manner that there is no interference from nearby machines while either one is being operated upon. This feature required special attention, considerable study being devoted to the arrangement of tools to

handle the standard sizes of plates and shapes used in boiler and tank practice. This studied arrangement is especially apparent around the group of machines 144, 143 and 162, where standard boiler plates may be readily flanged, rolled, punched or sheared without interference.

In addition to the equipment enumerated in the foregoing for both locomotive and boiler shops, there is considerable equipment of a miscellaneous nature. This includes such items as 6 each of 50, 40, 35 and 25-ton jacks, 90 bench vises, 18 heavy trucks, taps, dies, etc., chisels, pinch bars, sledges, box wrenches, surface blocks and oil burners.

THE FORGE SHOP is the first building north of the locomotive shop building as indicated in fig. 1. The interior arrangement of the tools and machines in this building is clearly shown in fig. 3. It is 260 by 100 ft., spanned by a single truss providing unhampered space for the location of the equipment.

The front of the building is to the left in fig. 3. On entering, the spring department is to the right in the southwest corner of the building. It is equipped to handle spring work for both locomotive and car departments, and has the following machines:

F43 Hydraulic squeezer.
F44 Hydraulic spring bander.
F45 Hydraulic punch.
F46 Hydraulic band remover.
F47 Combined nipper and trimmer.
F48 Tapering rolls.

The necessary furnaces, baths and racks are also provided as noted, and the whole is conveniently arranged. Ample floor space is provided to the north for the storage of the raw and finished product.

Further down the shop on the same side, there is a row of 13 double forges set at an angle as dictated by good practice. Adjacent to these is a row of six hammers, as follows:

F27 200-lb. Hammer.
F28 1250-lb. Hammer.
F29 1500-lb. Hammer.
F30 3000-lb. Hammer.
F31 3300-lb. Hammer.
F32 200-lb. Hammer.

It is here that the medium weight work is handled. In this section of the shop there is also a frame fire and necessary face plate, as well as these two machines:

F36 Vertical hydraulic shear.
F37 Alligator shear (m.d.)

The north side of the shop cares for the heavy work at the rear, where the following two machines:

F34 3500-lb. Hammer.
F34 5000-lb. Hammer.

with accompanying furnaces handle the heavier billets. All the steam hammers and large fires are provided with jib cranes for the handling of the work. Their locations are indicated in the illustration. F35 is a hydraulic bulldozer, with accompanying furnace, and F39 is a 3½-in. forging machine. The balance of large equipment is:

F38 Cutting-off and centering machine.
F42 Emery grinder.
F41 1½-in. Bolt machine.
F40 Hydraulic bar shear.

The balance of the floor space is for the storage of stock, dies, etc.

A small industrial track with necessary turntables, covers the building. At the front there is a foreman's office, while in a small two-story addition from the south side are the locker and toilet rooms.

The steam to the hammers, exhaust, oil and hydraulic piping are carried in concrete ducts through the shop to the various machines. The building is heated by indirect radiation from coils along the walls under the windows.

FORGE STORES AND SCRAP BINS are housed in a frame structure 30 by 220 ft., extending to the rear of the forge shop. The east 100 ft., i.e., the section furthest to the rear, is built with a roofed platform raised 4 ft. above the grades for the convenient handling of material to and from cars. This platform is divided into bins for sorting and storage of scrap. The section not raised is completely enclosed with plank lining inside and drop siding outside, and forms storage for coke, coal and iron stock. The iron stockroom is arranged with an extensive rack system for storing the different stock sizes for use in the forge shop. The coal and coke storage bins are arranged with roof hatches in order that cars may be unloaded by a clam shell and crane from the car and the coal or coke dropped through the roof. Industrial tracks connecting with those in the forge shop provide easy access for the entrance of materials and supplies.

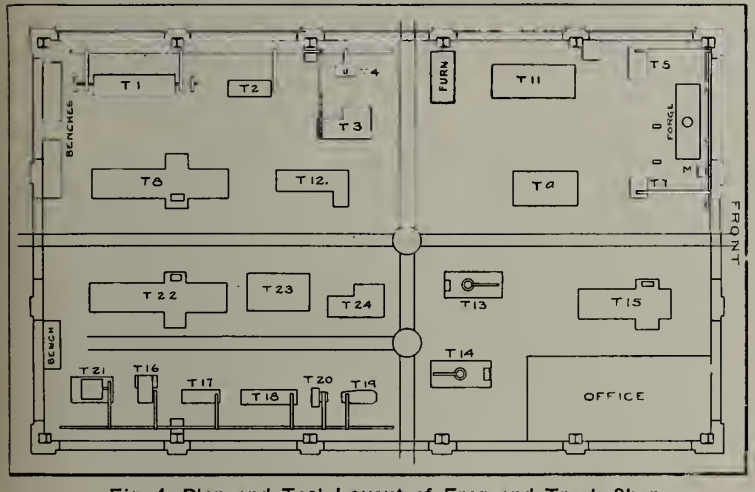


Fig. 4. Plan and Tool Layout of Frog and Track Shop.

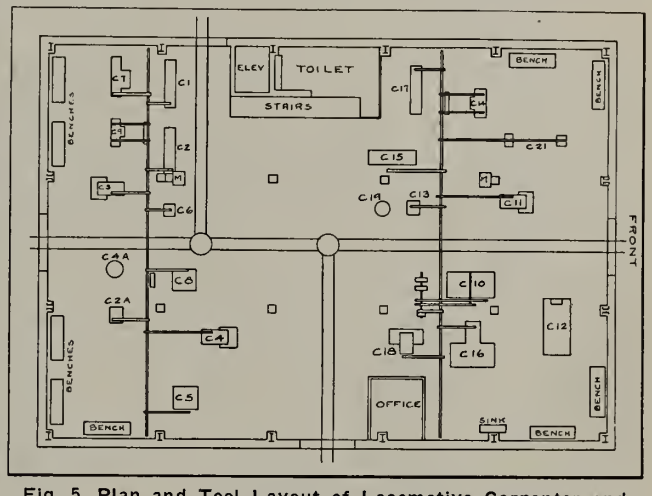


Fig. 5. Plan and Tool Layout of Locomotive Carpenter and Pattern Shop.

FROG AND TRACK SHOP.—This department is located in a building some distance to the rear of the forge stores and scrap bins. The building is 60 by 100 ft., with a 24-ft. clearance between floor and truss, and is spanned by a 10-ton electric travelling crane for the handling of the work. The shop was designed having in view the looking after of all repairs to frogs, switches, interlocking plants, and general track machine work. Fig. 4 shows the layout.

All the heavier motor-driven equipment occupies the body of the building, while the lighter, group-driven machinery is ranged along the walls. The whole is served by a continuation of the industrial trackage before referred to, with necessary turntables for spur tracks. The machinery equipment is as follows:

T1 18-in. Double head traverse shaper.
T2 12-in. Railway frog slotter.
T3 Cold cut-off saw.
T4 14-in. Double emery.
T8 Frog and switch planer (m.d.)
T12 Rail bender for rails up to 100 lbs. (m.d.)
T11 Bulldozer with crane (m.d.)
T5 200-lb. Strap hammer with crane.
T7 125-lb. Strap hammer with crane.
T9 25-in. Throat punch and shears (m.d.)
T15 36-in. Planer (m.d.)
T13 36-in. Radial drill (m.d.)
T14 36-in. Radial drill (m.d.)
T24 Cut-off saw (m.d.)
T23 3-spdle. Drill (m.d.)
T22 36-in. Planer (m.d.)
T21 Milling machine.
T16 16-in. Shaper.
T17 14-in. Bolt lathe.
T18 18-in. Engine lathe with taper attachments.
T20 6 x 36-in. Grindstone.
T19 24-in. Drill.

In addition to this equipment there is the usual miscellaneous material, including blower and motor, anvils and stands, sledges, set of blacksmith's tools, forges and furnaces.

The toilet and locker room is located in the southeast corner of the building, surrounded by an 8-ft. cement wall reinforced by expanded metal, thus allowing the crane to pass over it. The shop floor as in the other shops is formed of 3-in. wood spiked to sleepers bedded in bituminous concrete. Direct radiation from coils ranged along the walls is used to heat this building, owing to its comparatively small size.

THE CRUDE OIL STORAGE building is a 25 by 60 ft. concrete structure close beside the frog and track shop, and owing to the nature of its contents, is built mostly underground, the floor being 8 ft. below the grade, with the side walls projecting only 2½ ft. above the ground. A concrete roof carried on steel beams closes in the building, making it thoroughly fireproof.

Inside, on concrete foundations, there are four iron storage tanks, each with a capacity of about 8,000 gals. of crude oil. Compressed air connections are made to these tanks and the oil is forced out and distributed to the various buildings requiring it.

The tanks are so arranged that the pressure can be cut off and the tanks filled by gravity from tank cars standing on sidings alongside the building. Piping connections to the outside of the building, fitted with lock-up valves, are supplied for this purpose.

THE STORE HOUSE building is located at the southern end of the midway, directly across from the locomotive erecting shop. It consists of a large reinforced concrete platform 4 ft. above grade in order to have car and platform on the

same level for the handling of supplies from the storehouse to the various buildings.

On the platform there is a brick building 60 by 260 ft. with reinforced concrete roof carried on concrete posts. The front portion of this building is fitted up for an office for the storekeeper and clerks, and has a fireproof vault. The balance of the building is equipped with an extensive system of shelving, racks, reels, etc., suitable for arranging the varied stock of materials which the storehouse contains. Side doors along each side of the building give ready access to the interior from the wide loading platforms.

The building is lighted with incandescent lamps and is heated by a system of direct radiation coils. The office portion of the building has maple flooring throughout and the balance has a cement finish on top of the reinforced concrete, the same as the platform.

THE OIL HOUSE stands about 100 ft. to the rear of the store house on a platform 50 by 70 ft., and 4 ft. above the grade the same as the storehouse platform to which it is joined by a connecting platform at the same level. This connecting platform has ramps leading up to it from grade level at both ends.

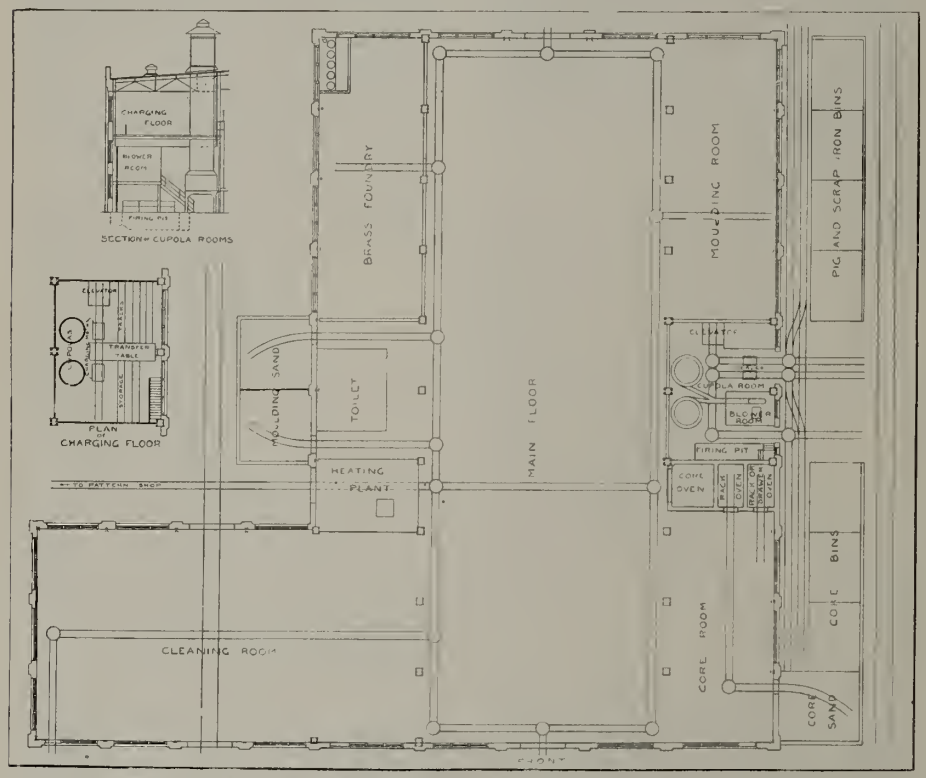


Fig. 6. Plan and Arrangement of Grey Iron and Brass Foundries.

The oil house has a basement below the platform with a 10-ft. headroom. In this basement on concrete foundations are 9 storage tanks for holding the various kinds of oil in stock. An additional tank for holding gasoline is buried outside the building with a pump connection into the building. The tanks are filled either by gravity through fill pipes from tank cars standing alongside the building, or else from barrels poured into fill boxes set in the platform floor and connected to the tank fill pipes. A system of drainage pipes is arranged for cleaning out the tanks.

On the top of the platform there is a small brick building 30 ft. long, with concrete roof and divided into two rooms by a concrete wall. The oil in the tanks below is handled by Bowser measuring pumps located in one of these rooms. The other room is used for storing oil cans, waste, etc.

Connecting basement and outside platform level there is a hydraulic elevator for the handling of barrels and similar material from the basement storage. There is also a stairway to the basement from inside the building, and also a pump running down from the outside.

The building and basement are heated by direct radiation coils and the floor is the same as the balance of the platform. The building is made as fireproof as possible, and the windows are glazed with ¼-in. wire glass.

THE STORES PLATFORM is situated on the midway, alongside the storehouse, and separated from it by two intervening tracks. It consists of a large 56 by 180 ft. reinforced concrete platform similar to those just described. It is carried on concrete posts, and is open below, the deck being at a 4-ft. level. The platform projects 15 ft. into the midway, enabling the midway crane to handle material to and from the other buildings.

On the platform, a light steel framework, enclosed on the sides and ends with corrugated iron and furnished with a roof covered with prepared roofing, furnishes a light protection. A 5-ton hand-operated crane spans the building and has a runway the whole length of the building out on to the front platform through wide crane doors to exchange loads with the midway crane. Access to the building is provided by four doors on the sides and one on each end, opening out to the platform. The building is lighted with incandescent lamps in groups with reflectors.

The stores platform is intended for use as a storage for large, heavy material such as castings and pipe, and thus act as a relief to the general storehouse for this class of material, which will be protected from the weather by the light structure and will be conveniently handled by the small crane.

THE LOCOMOTIVE, CARPENTER AND PATTERN SHOP is a two-storied structure, 70 by 100 ft, facing on to the midway directly north of the stores platform from which it is separated by a track to the latter. It has a self-supporting steel frame on concrete foundation. The upper floor is of reinforced concrete carried on concrete columns. The sides and roof are likewise of reinforced concrete, making a practically fireproof room, as all communications with it are protected by fire doors. It is used as a pattern storage and is equipped with shelving and racks for the purpose.

The ground floor has the usual 3-in. wooden floor and is used as the carpenter and pattern shop, being equipped with the following wood-working machines driven from line shafting:

C1 Pattern-maker's lathe.
C2 Pattern-maker's lathe.
C2A Face lathe.
C3 Band saw.
C4 Band saw.
C4A Wood trimmer.
C5 Small 24-in. planer.
C6 Combined grindstone and revolving oil stone.
C6A Glue pot.
C7 Knife grinder.
C8 Universal saw bench.
C9 2-spdle. Shaper.

The foregoing constitutes the machinery in the pattern section at the left or west end of the shop. The balance below comprises the carpenter section equipment:

C10 Planer, moulder and matcher.
C11 Band saw.
C12 Cut-off saw (m.d.)
C13 Combined grindstone and revolving oil stone.
C14 2-spdle. Shaper.
C15 24-in. Hand planer.
C16 3-spdle. Boring machine.
C17 Wood lathe.
C18 Tenoning machine.
C19 Wood trimmer.
C20 Glue pot.
C21 Swing cut-off saw.

The carpenter section equipment also includes two woodworking air drills with bits, chucks and 50 ft. of air hose.

The pattern shop is intended to look after the manufacture, alteration and repair of patterns and the carpenter shop to attend to the necessary woodwork incidental to locomotive repairs.

The lavatory and locker room is located about the centre of the north side of the room. Alongside are the elevator and stairs for communication with the upstair pattern storage. The stairway is enclosed, as is also the elevator shaft, the latter being of concrete.

THE GREY IRON FOUNDRY is a large building 130 by 200 ft., with a cleaning room annex 60 by 80 ft. It is directly north of the locomotive carpenter and pattern shop, and faces on the midway. The main plan and a couple of the detail views are shown in fig. 6.

The main foundry has a central bay 70 ft. wide and two side bays each 30 ft. wide. The central bay is used for the general moulding floor, and is spanned by a 5-ton electric travelling crane equipped with a 5-ton auxiliary hoist for light lifting. There are also small jib cranes attached to the columns for handling flasks, etc. The 30-ft. bay on the north side has a moulding floor for small castings at the west end, and core room and ovens at the east end, each served by a 1-ton hand-operated travelling crane.

There are three core ovens, two 7 ft. wide, 12 ft. long and 9 ft. high, with shelves and rack cars for general cores, with racks on one side and end, and one 12 ft. wide, 12 ft. long and 9 ft. wide, with racks on both sides and end. The doors of these ovens are of the counterweighted lifting type. The larger oven has a platform car for cylinder cores and other large work, and is served by a 5-ton jib crane. There is also a portable core oven.

Between the two departments on the north side of the building, the cupola room, 30 by 40 ft., is located. In it are two cupolas, 72 and 84 ins. in diameter respectively, and 50 ft. in height. Each cupola has 12 tuyeres.

The scale room for weighing the charges, and the blower room on an

elevated steel platform, are also in the cupola room. The core ovens are fired from this room also, keeping all the ash, etc., in one place. The loaded cars after weighing are raised by a 2-ton pneumatic elevator to the charging floor and are here handled by a couple of pneumatic charging machines, one for each cupola. The charging floor has a steel plate floor, and is laid out with a transfer truck and storage tracks for keeping loaded cars on hand ready for charging while the cupolas are running.

The 30-ft. bay on the south side of the building has a small brass foundry at its west end, enclosed by expanded metal screens 10 ft. high. There are 4 brass furnaces 26 ins. diameter, and one 32 ins. diameter, located in the corner of the building. This small foundry is equipped with regular brass foundry equipment, including tongs, shank, core-maker's bench, chipper's bench, band saw, spine cutter, 2 tumblers, 20 by 32 ins. and 24 by 36 ins. respectively, emery grinder and moulding machine. It is served with a one-ton crane.

The iron foundry has the following additional equipment: 20 charging trucks, 6 coke boxes, 10 steel frame yard trucks, 36 x 60 in., cinder mill, 4 tumbling barrels, 36 x 48 in., 2 emery grinders, exhaust system from tumblers and grinders, core wire straightener, 2 chipper's benches, 4 core-maker's benches, hammer core machine, 2 sand sifters, 6 18 by 18 by 36-in. water tanks, 20,000, 10,000 and 4,000-lb. geared ladles, 3 1,800-lb. truck ladles, 20 250-lb., 10 150-lb., and 20 60-lb. ladle bowls, brake shoe moulding machine, 8 moulding tubs, 90 moulding flasks in 4 sizes, 18 sets of moulding tools and a gravity moulding machine.

The cleaning room is at right angles to the main building, and is spanned by a 5-ton electric travelling crane. In this annex are located the tumblers, grinders, etc., and a service track runs through the room for the loading of cleaned castings right on to the cars for shipment.

The moulding sand is stored in bins on the south side, filled from cars on the service track and distributed by industrial tracks inside the building. Along the north side of the building, between the service track and the foundry, as shown in fig. 6, there is a long galvanized iron shed, roofed in and divided into separate compartments. Here are stored direct from the cars, the coke, pig and scrap iron under cover, and these are brought into the foundry on cars running on industrial tracks, also under cover between the bins and the building. Having both material and handling tracks under cover is a valuable feature in all winter weather.

THE MOTIVE POWER OFFICE is south of the locomotive erecting shop and opposite the storehouse. It is a brick structure with steel interior frame, 60 by 68 ft., consisting of two stories and a basement.

The basement is devoted to a large testing laboratory, lavatories and storage. The ground floor has offices for the department's officials and clerks, and on the first floor are the draughting room, file room, and blueprinting room. A vault is carried up from the basement to roof with vaults on each floor.

The floors are of maple on spruce joists carried on the walls and steel work. The interior is plastered throughout and the halls and stairs have a wood wainscotting. The building is heated by direct radiation coils and has incandescent electric lighting fixtures.

The Canadian Northern Ry. reports a total wheat haul for 1911, of 38,750,000 bush., an increase of about 14,000,000 over the previous year. About 8,000,000 bushels are still in elevators along the line.

Birthdays of Transportation Men in February.

Many happy returns of the day to:—

S. A. Baker, Canadian Freight and Passenger Agent, Chicago Great Western Rd., Toronto, born at Morrisburg, Ont., Feb. 1, 1877.

B. H. Bennett, General Agent, Chicago and North Western Ry., Toronto, born at Cobourg, Ont., Feb. 6, 1858.

F. L. C. Bond, Resident Engineer, G.T.R., Montreal, born there Feb. 21, 1877.

T. Britt, General Fuel Agent, C.P.R., Montreal, born there Feb. 3, 1871.

F. W. Churchill, C.P.R. ticket agent, Collingwood, Ont., born in London, Eng., Feb. 6, 1853.

H. R. Charlton, General Advertising Agent, G.T.R., and G.T.P.R., Montreal, born at St. Johns, Que., Feb. 9, 1866.

F. W. Cooper, Resident Engineer, C.P.R., Montreal, born at London, Ont., Feb. 16, 1880.

R. Crawford, Northwest Agent, Northern Navigation Co., Winnipeg, Man., born at Kingston, Ont., Feb. 21, 1870.

R. W. Drew, Division Freight Agent, Kootenay and Boundary Divisions, C.P.R., Nelson, B.C., born at Kingston, Ont., Feb. 17, 1874.

E. A. Evans, ex-General Manager and Chief Engineer, Quebec Ry., Light and Power Co., Quebec, born at Kensington, London, England, Feb. 26, 1855.

E. H. Fitzhugh, President, Central Vermont Ry., Southern New England, Ry., and Montreal and Southern Counties Ry., Montreal, born in Montgomery county, Mo., Feb. 1, 1853.

L. O. Genest, General Storekeeper, C.P.R. Western Lines, Winnipeg, born at St. Henri, Levis County, Que., Feb. 16, 1856.

T. C. Hudson, Master Mechanic, C.N.Q.R. and Q. & L. St. J. Ry., Joliette, Que., born at Brockville, Ont., Feb. 20, 1873.

W. Jackson, C.P.R. ticket agent, Clinton, Ont., born there Feb. 4, 1860.

C. Gardiner Johnson, Lloyds' Agent for British Columbia, Vancouver, B.C., born at Dumblane, Perthshire, Scotland, Feb. 8, 1857.

R. S. Logan, Vice President, G.T.R., Montreal, born at St. Louis, Mo., Feb. 13, 1864.

G. L. McCrea, Local Freight Agent, C.P.R., Vancouver, B.C., born at Springtown, Ont., Feb. 9, 1876.

D. MacPherson, Assistant to Chairman, National Transcontinental Ry. Commission, Ottawa, born at Bath, Ont., Feb. 2, 1858.

T. McNabb, Master Mechanic, Alberta Ry. and Irrigation Co., Lethbridge, Alta., born in Scotland, Feb. 16, 1849.

J. K. McNeillie, Superintendent, District 1, C.P.R., Farnham, Que., born at Toronto, Feb. 23, 1874.

D. C. Macdonald, Division Freight Agent, C.P.R., Regina, Sask., born at Elmsdale, N.S., Feb. 9, 1874.

C. S. Maharg, Superintendent, C.P.R., Calgary, Alta., born in Dufferin County, Ont., Feb. 4, 1867.

G. A. Montgomery, Superintendent, Algoma Central and Hudson Bay Ry., and Algoma Eastern Ry., Sault Ste. Marie, Ont., born at Bradford, Ont., Feb. 11, 1871.

A. Z. Mullins, Commercial Agent, G.T.R., Grand Rapids, Mich., born at Appin, Ont., Feb. 14, 1862.

M. G. Murphy, District Passenger Agent, C.P.R., Toronto, born at Halifax, N.S., Feb. 26, 1878.

G. J. O'Dowd, City Freight Agent, C.P.R., Quebec, born at Montreal, Feb. 4, 1874.

J. E. Proctor, District Passenger Agent, C.P.R., Brandon, Man., born at Sarnia, Ont., Feb. 17, 1878.

A. H. Robinson, Superintendent, Elgin and Havelock Ry., Havelock, N.B., born at Elgin, N.B., Feb. 2, 1862.

J. E. Robitaille, Accountant and Auditor, Ha Ha Bay Ry., Chicoutimi, Que., born at Quebec, Feb. 17, 1870.

A. E. Rosevear, Assistant General Freight Agent, G.T.R., Montreal, born Feb. 20, 1863.

H. H. Schaefer, Division Freight Agent, Intercolonial Ry., St. John, N.B., born at Cologne, Germany, Feb. 10, 1848.

J. G. Scott, ex-General Manager, Quebec and Lake St. John Ry., Quebec, born there Feb. 13, 1847.

G. Spencer, Superintendent, C.P.R., Sudbury, Ont., born in London, Eng., Feb. 21, 1865.

H. E. Suckling, Treasurer, C.P.R., Montreal, born at Gibraltar, Feb. 27, 1851.

Hugh Sutherland, Executive Agent, Canadian Northern Ry., Winnipeg, Man., born at New London, P.E.I., Feb. 22, 1845.

Sir Wm. C. VanHorne, K.C.M.G., director, C.P.R., and President, Cuba Co., Montreal, born in Will County, Ill., Feb. 3, 1843.

Superheating for Locomotives Instead of Electric Locomotives

The probability of the substitution of electricity for steam as a motive power for railways, on the score of reduced cost of operation, has been somewhat lessened by the extended application of superheat to locomotives. It now looks as though superheat will achieve those economies which, at least in practice on this continent, compounding has failed to secure. The simple engine always possessed certain practical advantages over the compound, and the addition of superheat makes it possible to secure equal and often greater fuel economy in a locomotive of the simple type, than is possible in a non-superheat compound. The increasing application of superheat may easily be set down as the most important development in locomotive practice of the past year. In spite of predictions to the contrary, the weight and size of Canadian and United States locomotives, and, to a less degrec, of foreign locomotives, continue to increase. Today, in the huge engines built for the Santa Fe Ry., surely the limit has been reached. A passenger locomotive for hauling fast passenger trains weighs 188 tons without the tender. The Santa Fe Mallet freight locomotive, with 24 wheels, 20 of which are drivers, weighs 308 tons, and with the tender, 425 tons, its length over all being 120½ ft.

Canadian Steel.—Experiments made at McGill University by J. W. Evans, of Belleville, Ont., reported in Machinery, have apparently demonstrated that the titaniferous iron ore which abounds in Ontario and Quebec can be converted directly into steel by the electric process, and thus made commercially valuable. Tool steel of a superior quality can, it is said, be produced at a cost of about 2 cts. per lb. One experiment was made with a ½-ton electric furnace, into which 230 lbs. of ore was placed and from which 110 lbs. of steel was produced. The steel was poured directly into moulds and cast into lathe and planer tool shapes, which were ready for use after being hardened, tempered and ground.

The Board of Railway Commissioners will, at its sittings in Ottawa, Feb. 6, consider the matter of requiring all railway companies subject to its jurisdiction to equip their locomotives with dump ash pans, or other appliance, to avoid the necessity of enginemen or others going underneath to clean them.

Mechanical Methods and Devices.

Planer Clamp for Switch Points at the Canadian Steel Foundries' Plant.

The two accompanying illustrations show a very handy planer clamp used at the Canadian Steel Foundries Montreal plant, R. Nickle, Master Mechanic, for such work as planing switch points and rails in general. By its use it is possible for the operator to loosen, remove and set up another pair of points ready for planing in five minutes or less.

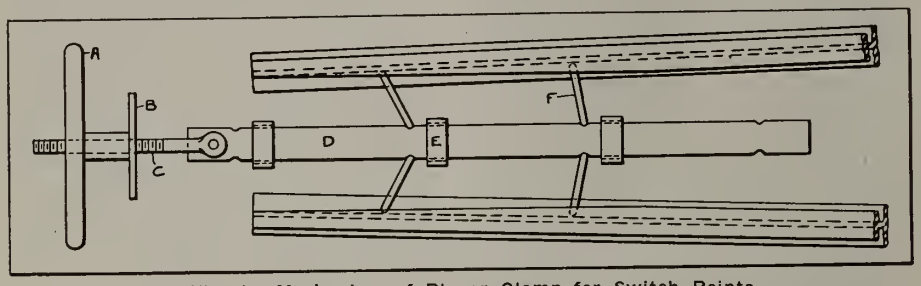


Fig. 1. Mechanism of Planer Clamp for Switch Points.

Referring to figs. 1 and 2, which are similarly lettered, there is a threaded wheel A, bearing against a stationary plate B, bolted to the planer table. A square-threaded bolt C, on which wheel A works, is pin-connected on the other side of plate B to a central bar D passing along midway between the two rails on the table. This bar is guided by enclosed ways E. The central bar D has notched sides, and bearing in these recesses there are short struts F, which when central bar D is drawn back by the hand wheel A, are forced outward against the rail on each side, holding it securely against formed pieces and bolted to the planer table in the proper location to give the requisite taper to the rail edge. These outer holding blocks are so shaped as to fit closely around the rail base, so that when pressed outward against these blocks no further holding down pressure is required.

To replace rails, the hand wheel A is released, loosening struts F, which are removed, allowing the rails to be swung up out of their places. As previously mentioned, very rapid setting up is possible. Not only that, but the device acts essentially as a jig, producing duplicate work with but little care on the part of the operator after the first one has been properly located.

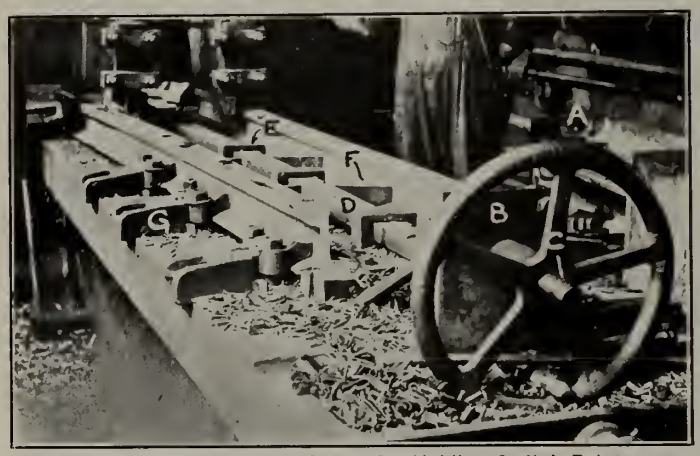


Fig. 2. Planer Clamp for Holding Switch Points.

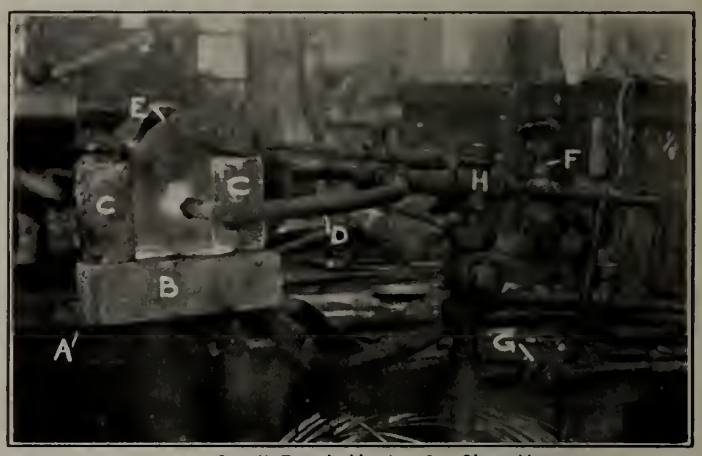
The Goderich Elevator and Transit Co., Goderich, Ont., handled 7,250,000 bush. of grain during 1911, against about 4,550,000 bush. in 1910.

Small Bench Heater at the C.P.R. Angus Shops.

A simple little bench heater using gas is employed at the C.P.R. Angus Shops for heating soldering irons and small parts. The general arrangement is shown in the accompanying illustration.

A bent steel plate A of required form, bolted to the work bench, carries a couple of fire bricks B laid flat upon it, with two more bricks C standing on edge forming a combustion chamber. Mixed gas and air enter this chamber from each side through bent tubes D, on to which plates E are slipped, concentrating the heat in a small intense zone. In or over this flame the soldering iron or article to be heated is placed as shown.

Air entering through, and regulated by, valve F, and gas through and controlled by valve G, mix at H. The proper proportions may be simply obtained by the regulating valves.



Small Bench Heater for Shop Use.

The Union Pacific Rd. has presented to the engineering section of the McGill University, Montreal, a working model of the electrically operated automatic block signal in use on its lines.

During Nov., 1911, eleven employes were killed and 23 were injured in the course of their work in connection with steam railways in Canada. Of the fatalities, three were due to being run over, two each to collisions, to crushing, to falling material and to being struck by locomotives.

Recessing Tool at G.T.R. Point St. Charles Shops.

Babbitt, when used as the lining metal for locomotive eccentric straps, is held in place in the sheave by projecting prongs of babbitt run into holes in the inner face of the strap itself, as all shopmen know. To form the necessary holding recess in the babbitt hole, a neat little tool is used in the locomotive machine shop of the G.T.R. Point St. Charles Shops, Montreal, over which J. Lees is General Foreman.

This tool, shown sectioned in fig. 1 and standing to the left on the jig in fig. 2, consists essentially of a taper-shank body A, pinned in a slot in the end of which are two cutters of form B free to swing radially outward. Their normal position is such that the points fall within the outer surface of the body leaving no projecting edges. The points are of the required shape to give the fan required to the babbitt-holding recess.

A pin of shape C, free to move within limits set by a set screw in the body A fitting into a slot in the side of the shank of C, is held normally in its outer position by a coiled wire spring D in the body of the holder.

The hole to be recessed is first drilled the required depth with an ordinary drill, which is then removed, and the recessing tool introduced in its place. On being lowered into the hole (which is the same size as the body of this tool), the pin C strikes the bottom, and being prevented from proceeding further, forces out the cutters B on its tapered face, as the body continues to lower, the cutting action being thus purely radial.

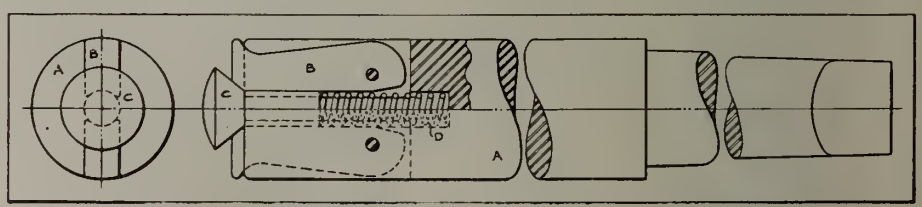


Fig. 1. Tool for Recessing Babbitt Holes in Eccentric Straps.

The jig and process used for this operation are rather interesting, and are shown in fig. 2. The jig, consisting of a square body with a circularly movable plate thereon, is bolted to the side of a radial drill table as indicated. To the movable plate the strap to be drilled and recessed is attached and secured thereto by a clamp. Into the strap a drill jig is placed. In the hole to be drilled and recessed a drill bushing is

slipped, and the movable plate swung around until a level, placed on the face of the drill bushing, indicates that the latter is level. The whole device is securely clamped in this position and the operations proceeded with. Each hole

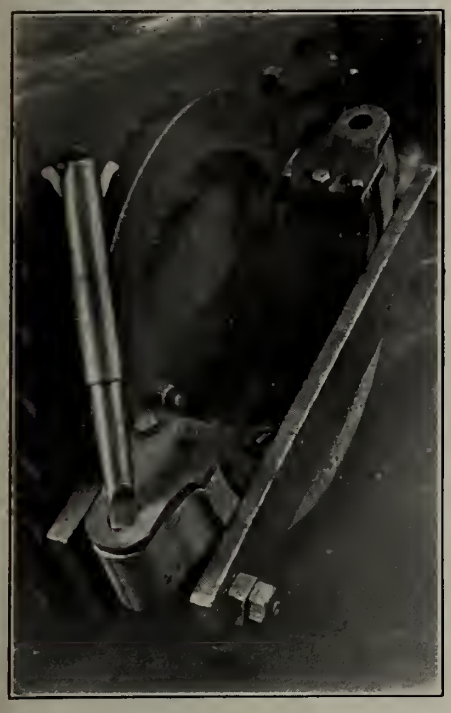


Fig. 2. Jig for Holding Eccentric Straps while Recessing Babbit Holes.

is separately levelled up, drilled and recessed in this manner.

Pneumatic Sledge for Heavy Cutting.

Where there is very much heavy cutting, such as severing staybolts in the firebox side sheets, etc., the employment of a couple of men with sledge hammers proves a slow and expensive means of accomplishing the desired end. To meet the demand for a better method, a heavy pneumatic sledge of the construction shown herewith, was designed and built at the New York Central Lines Beech Grove shops.

The construction of the main portion of the device is very similar to that followed in standard pneumatic chipping and rivetting hammers being made up of a cylinder A in which there is a hardened steel piston B, the latter made a sliding fit in the cylinder. This cylinder body is made of a piece of 4½-in. hydraulic pipe, 4 ft. in length, bored to a 3½-in. diameter. Attached to the lower end is the head C, which holds the operating chisel. Air entering at the top gives the piston plunger its impetus, and air introduced below the hammer raises it for the next stroke.

The manner of controlling the air is interesting and unique. Attached to the upper end of the cylinder there is a chamber D of relatively large size. A direct connection to this chamber is given from the air hose nipple at E through pipe F, with no intervening valves. The chamber serves as a reservoir to fill up rapidly the space behind the piston, so that the latter has full air pressure acting on it. Thus, when the valve G is opened by raising lever H, the cylinder has the large reservoir to draw upon, reducing the pressure fluctuations due to the intermittent action of the hammer; this would be large if the supply pipe led directly to the cylinder.

The piston hammer is raised by means of the by-pass pipe-connection I leading from the air hose to the bottom of the cylinder, controlled by valve J. In service the operator first raises lever G, which impels the piston hammer. At the end of its stroke, this lever G is returned to its normal position and valve J opened, thereby raising the hammer. This is the cycle of operation. To relieve the air pressure in the cylinder ends after the respective strokes, a ⅜-in. hole is provided near each head through which the pressure quickly dissipates.

Grinding in Ball Joints.

Grinding-in Ball Joints at the Intercolonial Ry. Moncton Shops.

The accompanying illustration shows a neat device for the holding of the ball joint while being ground-in to fit it's seat. The device as shown is attached to a small air motor which revolves the ball joint at a good speed.

Consider the holding device. A collar A secured to the revolving shaft has three fingers B pinned to it, and free to swing outward. The shaft itself below collar A is threaded, and over this threaded section an unthreaded washer C fits, movable up or down by a nut D. The washer C has three equidistant slots about ¼-in. deep, of the same width as the fingers B.

When not in use, the fingers B fit into the grooves in washer C. When ready to be used, the whole device is slipped down inside the ball joint to be ground in, the fingers B lifted out of their slots,

Babbitting Journal Brasses.

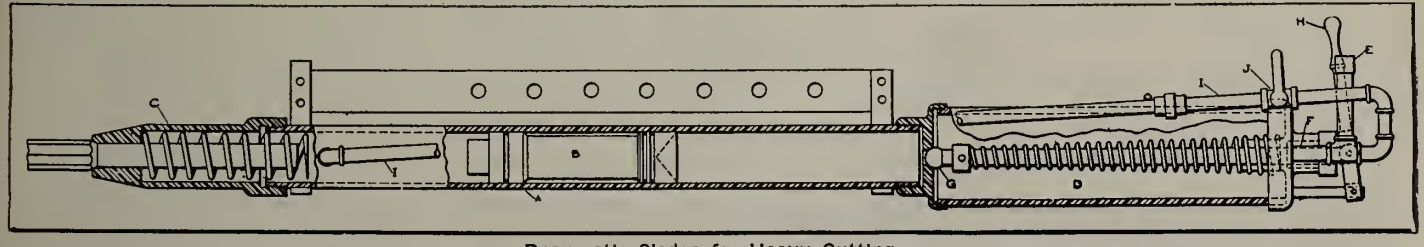
and the washer given a slight turn, the fingers dropping back in place on the outer surface of the washer. Screwing up the nut forces the fingers outward against the inner surface of ball joint, gripping it securely.

To release, the operation is reversed. The nut is loosened, washers twisted around until the fingers fall into the slots, and the device is then readily removed. The slots save a lot of lengthwise movement of the nut.

Babbitting Journal Brasses at the Central Vermont Ry. Shops.

An excellent method of babbitting journal brasses is in use at the Central Vermont Ry. shops at St. Albans, Vt., the method and the rig used being due to Alex. Tuscany, Foreman Moulder, who has charge of this work. The rig in which the actual babbitting is done is of particular interest.

The device used is shown in the accompanying illustration. A battery of four hollow cylinders A, are mounted on a base plate B. The cylinders have side pieces C bolted to them, against which the flat face of the journal brass is pressed. The journal brass is held in position while babbitting by an arm D, fulcrumed to the supporting table at the point E. A weight F, adjustable along the right-angle arm of the fulcrumed arm D, is secured by a set screw at a sufficient offset to maintain a pressure on the back of the brass at



Pneumatic Sledge for Heavy Cutting.

the holding-on member G. Pressure of the foot on the tread H releases the brass.

The mould forms are made hollow, as just mentioned, in order that water-cooling of the poured babbitt may be obtained. From under the table there is a pipe connection to each cylinder through which cooling water flows, passing out through the top pipe indicated, the flow in each case being independently regulated by a valve.

When in operation, the water connection is turned on the desired amount. The brass, already heated in a fire to somewhere around the babbitt melting point, is placed in position on the stand, and the intervening space filled with molten babbitt, which almost instantly sets, being chilled by the water-cooled surface of the mould. The brass can then be taken out at once, no time being lost waiting for the cooling, as required in most methods.

Canadian Pacific Railway Coal Handling Plant at Fort William.

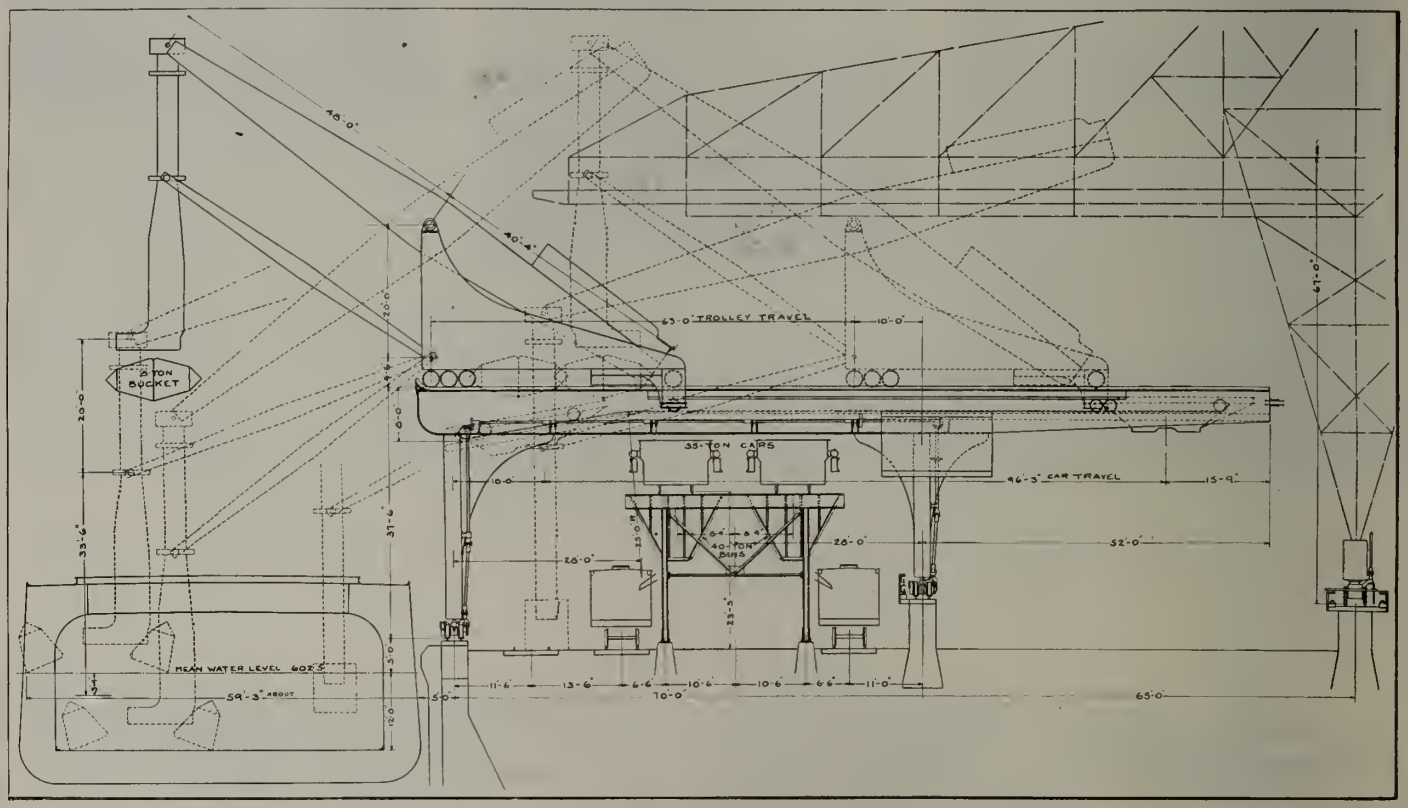
The Canadian Pacific Ry.'s coal handling equipment for its new dock at Fort William, Ont., will consist of two Hulett patented, electrically operated, 8-ton coal unloading machines, one 9-ton rehandling bridge, three 35-ton scale larries, and about 3,000 ft. of bin and trestle system, as well as Christy box car loaders.

The plan of operation of this plant will be as indicated on the accompanying illustration. Coal will be taken out of the boats with the unloaders and deposited at the front of the dock in a so-called bucket car. The unloader will then immediately go back into the boat for another load. While the unloader is securing this load, the bucket car will be drawn back over the bin and trestle system, and the coal deposited in scale larries for distribution into the various bins. Or, if coal is not wanted for immediate shipment, it will be hauled out side through the supporting posts of the trestle, so that they can start at one end of the bin system and work down through, loading all the cars on one side. While these cars are being hauled away and replaced by empties, the box car loaders will be working back, loading the cars on the other side of the trestle, in this manner giving continuous operation. As the contents of each bin will be weighed in to correspond with the capacity of the car, the car, when released, will be at once ready for main line service without further trimming. This weighing feature is a new departure on coal docks, but has been used extensively on lower lake ore docks for the past two or three years and is considered very successful.

The transfer cars, as well as all other machines on the dock, are to be operated by electricity, 220 volts direct current. The same cars will also be used in rehandling coal for storage, running out on the trestle and receiving their load opposite the rehandling bridge, wherever stationed. The trestle will be a double-track system with suitable cross-overs so that cars can be kept in continuous operation. The coal going into the permanent storage will be rehandled out of the temporary storage pile under the rear of the unloaders by the rehandling bridge. The rehandling bridge carrying a 9-ton bucket will have a cantilever covering this storage pile, as well as extending out over the trestle system. The coal will be taken out of the temporary pile, carried back and deposited in the main storage by this bucket. A still further storage will be provided by an extended cantilever on the rear of the bridge. The bridge will be 520 ft. over all and will carry the largest coal bucket ever constructed, the one bridge being ample to take care of all the coal that the two unloaders can remove from the boats. This dock is intended to handle railway coal only, and no attempt is being made to separate grades; in other words, a screening plant will not be required. The unloaders, bridge and transfer cars will all be protected against the breaking of coal, and it is expected that this new dock will be one of the fastest ever constructed, the unloader being of the same general type as the machines now in use on the majority of lower lake ports, for handling ore and having fully demonstrated their high speed and economical operation.

The important feature of this new design is the separation of the unloading from the shipping and rehandling machine. The unloaders, the bin system and the bridge will be all absolutely independent of each other in their operation. The bridge can be shipping out coal from one end of the dock while the unloaders are receiving coal on another portion. The bridge, being of such large capacity, has an opportunity, when there is no boat at the dock to clear the temporary storage and prepare it for incoming boats.

The power for operation will be furnished first as high tension alternating current and be transformed at the dock into a direct current which enables the use of dynamic braking on the machines. These large machines will be



Unloading Mechanism and General Arrangement of C.P.R. Coaling Plant.

controlled under this principle, in a very simple manner, very similar to the operation of the elevator in an ordinary office building, the motors being used for lowering, as well as hoisting the loads. The manual work which will come upon the operator of the machine will be very simple, enabling high speed operation. The coal being handled in large units and prevented at all points from dropping, will be broken much less than with the ordinary grab bucket system. It is expected that this plant will very readily handle the largest boats that are in use on the great lakes, in one day's time—10 hours.

To give an idea of the size and capacity of these machines it may be mentioned that the motor equipment on each of the unloaders will consist of a total of 550 h.p., and the bridge will have motors aggregating 700 h.p.

The unloaders will be built entirely of steel and weigh in the neighborhood of 600 tons each. There will be about 1,800 tons of bin and trestle system. The bridge will be approximately 800 tons. The most modern construction will be used in every detail.

The contract for furnishing the coal handling equipment has been given to the Wellman-Seaver-Morgan Co., Cleveland, Ohio.

The Canadian Pacific Railway Shops Near Calgary.

As officially announced in our last issue, the C.P.R. has let a contract for its western shops, which will be located on the main transcontinental line, about 4½ miles east of the present shops at Calgary, Alta.

THE MAIN LOCOMOTIVE SHOP building will contain the erecting shop, machine shop, blacksmith shop and boiler shop. The erecting shop will be of the transverse lift-over type, and will contain 35 bays of 22 ft. each. Its entire area will be served by travelling electric cranes carried on two levels. It will be of structural steel frame on concrete foundations. The exterior walls up to window sills will be of concrete, and the walls, which are carried on steel members, will be of hollow tile, plastered. It will be heated by indirect fan system distributed by concrete and tile ducts.

TENDER AND WHEEL SHOP.—The department for making repairs to locomotive tenders, steam shovels, lidgerwoods and other maintenance of way equipment will be contained in an L shaped building 80 by 340 ft., and will be equipped with a 20 ton high speed travelling electric crane having two 10 ton trolleys. There will be a depressed track carried along the ends of the wheel storage tracks outside, to facilitate unloading and loading wheels and axles. The building will be of structural steel frame, with steel roof trusses, and its general construction will be similar to the main locomotive shop.

THE STOREHOUSE AND OFFICE BUILDING will be 250 by 60 ft., two stories, with offices at one end three stories high. It will contain an electric elevator, vaults and platform scales. It will be parallel with the main building, the space between to be spanned by a high speed travelling crane, which will handle all material to and from the cars and from the storage place that is provided between the storehouse and the erecting shop. The concrete foundations will be carried up to bring the floor of the storeroom to car door height, and the walls above will be either brick or hollow concrete blocks, supported on concrete foundation walls, the woodwork of heavy timber comprising slow burning mill construction. The building will be heated by an indirect fan system, and sprinklers will be installed for fire protection.

THE OIL HOUSE, 102 by 42 ft., will be similar in construction to the storehouse.

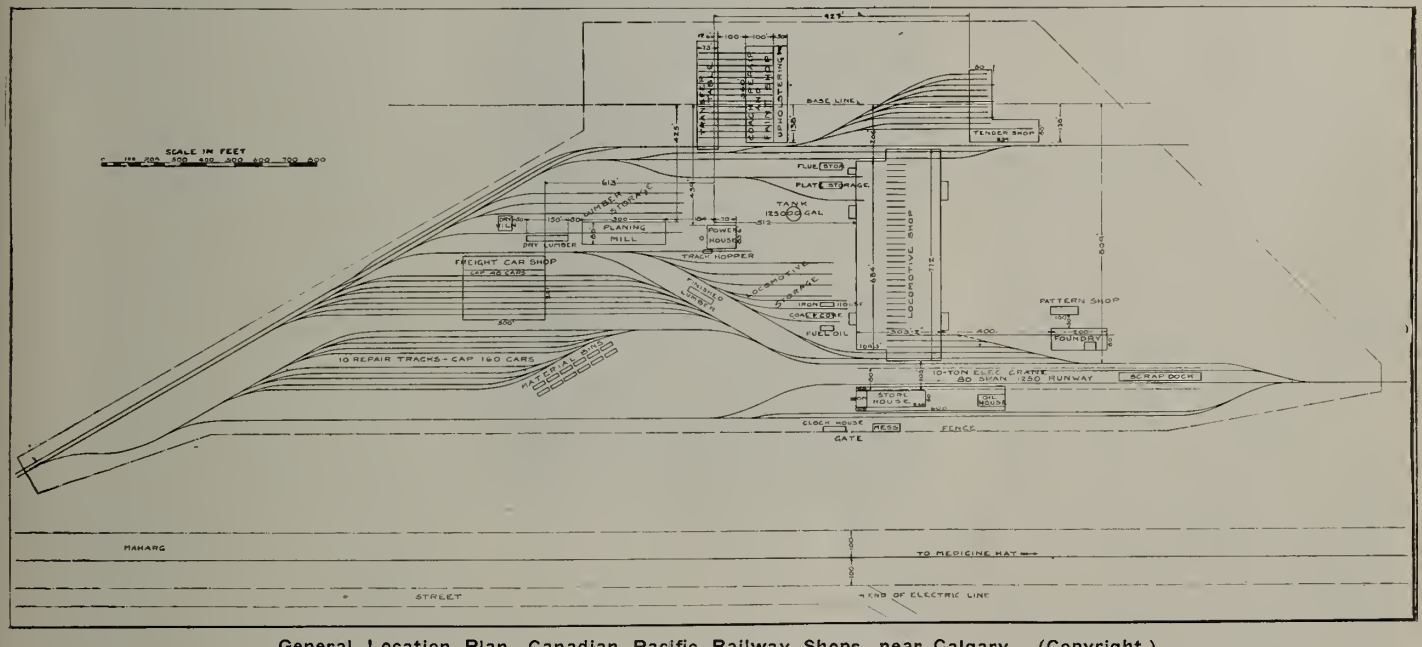
THE FOUNDRY will be 204 by 80 ft., of similar construction to the main building, having two bays, one of these of higher cross section to be served its entire length with a high speed travelling electric crane. Jib cranes attached to building columns will be provided and so arranged that they may be moved from one location to the other if desired, handled by the travelling crane. In the side bay of lower cross section space will be provided for core making and snap moulding floor. The charging floors and cupola will be located in the centre of the low bay. The heating will be indirect fan system distributing through galvanized iron pipes carried overhead. Steam, air and water service, including fire protection and drinking water, will be provided. The location of this building, alongside yard crane, will enable the unloading of scrap and pig iron to be taken care of by the crane. This close proximity of the foundry to the crane will also reduce to the minimum the handling of the castings from the foundry to storage or to the main shop, or loading for shipment.

THE PATTERN SHOP, 100 by 30 ft., for pattern storage and pattern making, will be of similar construction to storehouse.

THE COACH REPAIR AND PAINT SHOPS will be contained in one building 362 by 146 ft., having 15 tracks at 24 ft. centres. It will be of slow burning mill construction, having concrete block or hollow tile walls on concrete foundations. It will be heated with the indirect fan system distributed underground in concrete and tile ducts, and protected from fire by automatic sprinklers.

TRANSFER TABLE AND PITS.—For serving the coach shop there will be installed a 75 ft. transfer table of 150 tons capacity, equipped with an electric motor. The transfer pit and track foundations will be constructed of concrete. This pit will extend far enough at either end of the building to provide entrance and egress at both ends.

THE FREIGHT CAR REPAIR SHOP, 300 by 231 ft., is designed to contain eight repair tracks placed in pairs, giving room for an industrial material track between each pair of tracks. A brick wall will partition off a shop 50 ft. wide along one side, which will contain the blacksmith forges, woodworking and machine tools, the heating plant and foreman's office. The location of this building alongside of the lumber yard will permit of handling lumber so that it can be passed through into the shop without rehandling. An overhead trolley beam will be erected to permit of handling timbers with a trolley into the shop. Material bins will be located convenient to the building for storing material used on the cars repaired in the



General Location Plan, Canadian Pacific Railway Shops, near Calgary. (Copyright.)

shop. The building will be constructed with walls supported on concrete foundations having steel posts supporting steel trusses. The roof will be of the saw-toothed construction to afford good daylight lighting. The general construction of the building otherwise will be the same as that described for the other buildings, including fire sprinklers and indirect fan system for heating.

YARD CRANE.—The entire area, about 80 ft. wide, between the storehouse and the locomotive shop will be served by a high speed travelling crane of 10 tons capacity. The runway for this crane will extend for more than 1,200 ft., passing down alongside of the foundry and covering the space occupied by the scrap dock. One of the storehouse tracks will extend through under this crane, giving ample space for the storage of heavy material alongside of the storehouse, foundry and locomotive shop. By this arrangement heavy material will be unloaded, stored and rehandled to the shop or loaded out again for shipment by the crane, practically eliminating manual labor in the handling of all heavy material.

THE POWER HOUSE, 104 by 84 ft., will have sufficient space for boiler equipment necessary to provide steam for heating the shops, and for such other purposes as steam will be required throughout the shops. The building will have brick walls carried on concrete foundations, with steel roof trusses and supports for coal bunkers. The chimney will be of reinforced concrete or masonry. Overhead bunkers for coal will be provided and concrete dumping pit for unloading coal. An overhead storage bin for shavings will also be provided and another overhead storage bin for cinders, from which bin they can be discharged by gravity into cars alongside of the building.

THE PLANING MILL, 300 by 80 ft., will contain the wood-working machinery, having a track extending through longitudinally to permit of movement of material to the various machines, with the minimum amount of handling. The building will be located so as to be convenient to the coach shop and freight car shop. The lumber yard will be located back of and at one end of the planing mill. The building will be of hollow concrete blocks or hollow tile walls, carried on concrete foundations, with steel roof trusses covered with 4 in. plank sheathing. The heating will be the indirect fan system. Provision has been made for lavatories, metal lockers and suitable piping for distributing compressed air and water, including fire protection and drinking water.

THE MESS BUILDING will be about 150 by 30 ft., of one story, except a portion of the centre, which will be carried up two stories.

MISCELLANEOUS BUILDINGS. — Included in the scheme will be dry kiln, scrap docks, material bins, plate and iron racks, and other miscellaneous buildings in the yard, the details of which have not yet been gone into fully.

The cost of the shops will be about $2,500,000.

We are indebted to J. G. Sullivan, M. Can. Soc. C.E., Chief Engineer, Western Lines, C.P.R., for the foregoing information.

Westinghouse, Church, Kerr and Co., New York, are the contractors.

The C.P.R. recently reported in connection with the eastern movement of grain, that in one day of 24 hours the number of cars of freight moved from Winnipeg eastward was 1,003, and the total number of cars moved to and from Winnipeg on all divisions during that day was 3,389. In the eastward movement, trains consisting of 45 cars were dispatched from Winnipeg at intervals of about an hour.

Large Railway Expenditures to Continue.

Sir Edmund Walker, President, Canadian Bank of Commerce, in his address to the shareholders at the annual meeting recently, said:—

"The extension of the three railways, the Canadian Pacific, the Canadian Northern and the Grand Trunk Pacific has been carried on to a greater extent than at any previous time and the disbursement of money in this connection has materially helped the prosperity of the western provinces. It is likely that these expenditures will continue for some years to come in order to meet the growing requirements of the country."

Approval of Route Plans of Railways Under Dominion Jurisdiction.

The following route plans have been approved by the Minister of Railways. The date of approval was Dec. 21, 1911, unless otherwise stated:—

ALBERTA CENTRAL RY.—Revision between Rocky Mountain House and Yellowhead Pass, about 82 miles.

From main line to Big Horn Coal Fields, about 27 miles.

ALGOMA CENTRAL AND HUDSON BAY RY.—From mileage 83.80 to National Transcontinental Ry. (revision), 92 miles.

CANADIAN NORTHERN ONTARIO RY.—Ottawa-French River line, revision in counties of Pontiac and Renfrew, about 20 miles.

Sudbury-Port Arthur, revision in Algoma district, 18 miles.

Sudbury-Port Arthur, revision in Algoma and Thunder Bay districts, about 95 miles.

CANADIAN PACIFIC RY.—Wilkie-Anglia branch (revision), about 15 miles.

Swift Current, southeasterly, revision between mileage 40 and mileage 102.

Moosejaw southwesterly (revision), 29 miles.

Bassano easterly, 154.08 miles.

Revision of Manitou Lake branch, 48.9 miles.

Shepard to Medicine Hat, 186 miles.

Tantallon to Dysart, 113 miles.

CANADIAN NORTHERN RY.—Moose Jaw-Kindersley Extension further revision, about 132 miles.

Yorkton to Hudson Bay Jct., Sask. (revision), about 27 miles.

Strathcona to Camrose, Alta. (revision), about 9 miles.

Through tps. 1-3, ranges 3-28, w. 4th mer. (Alberta), about 170 miles.

Revision of Maryfield-Lethbridge line, about 240 miles.

Calgary to McLeod, Alta., thence westerly to Kootenay Pass, about 165 miles.

Underhill to Lampman, about 126 miles.

Craven to Yorkton, Sask., about 144 miles.

CANADIAN NORTHERN BRANCH LINES.—Craven towards Hudson Bay Jct., Sask., about 75 miles.

Tp. 23, r. 17 to tp. 29, r. 21, w. 3rd mer., Sask., 46 miles.

EDMONTON, DUNVEGAN AND B.C. RY.—Edmonton to Dunvegan, about 309 miles. approved Dec. 15, 1911.

ESQUIMALT AND NANAIMO RY.—Black Creek to Duncans Bay, about 25 miles.

GRAND TRUNK PACIFIC BRANCH LINES CO.—Lazare to Edgely and Le Bret, about 144 miles.

Edson to Pacific Northern and Omineca Ry. (revision), about 53 miles.

Calgary to Coutts, about 170 miles.

GRAND TRUNK PACIFIC RY.—Mountain Park coal branch, about 27 miles.

Moose Jaw, northwesterly (revision), about 7 miles.

Canora to Etoimami, about 90 miles.

PACIFIC AND PEACE RY.—From east of Bella Coola and Dean Channel to Dunvegan, about 450 miles.

PACIFIC NORTHERN AND OMINECA RY.—From the 6th to the 8th meridian via Pine Pass, about 325 miles.

The St. John and Quebec Railway Contract.

The St. John and Quebec Ry. Co. has entered into a contract with the New Brunswick Government for the building of a railway between St. John and Grand Falls, N.B., practically following the valley of the St. John River all the way. This company was incorporated by the N.B. Legislature, at the same time as the legislation was passed providing that the province would guarantee up to $25,000 a mile the bonds of any company entering into a contract to build the line. This guarantee was made conditional upon the building of a line to a certain standard, the obtaining of a grant under the usual terms from the Dominion Government, and the making of an agreement for the operation of the line as a part of the Intercolonial Ry. system.

The surveys were made under the Provincial Government, and after considerable discussion a route was decided upon which will have a gradient of 0.4% going east and 0.6% going west, as between St. John and Fredericton, and not exceeding 1% between Fredericton and Grand Falls. To provide this gradient, however, it will be necessary to build three large bridges on the line, viz., over the St. John River near Grand Falls, on the lower reaches of the Mistake River, and across the Kennebecasis River at Perry's Point. The cost of these structures delayed the final completion of the arrangements until the Dominion Government agreed to provide the money necessary for their erection, in addition to the usual subsidy. The line will be about 210 miles long, and the final location surveys, prior to starting construction, are being made under the direction of Ross Thompson, Chief Engineer, whose headquarters are at Fredericton, N.B.

The contract for the building of the line was signed on behalf of the St. J. and Q. Ry. Co. by A. R. Gould, President, and J. M. Thomas, Secretary, who hold similar offices in the Aroostook Valley Rd., which has its offices at Presque Isle, Me., and are also associated with the Aroostook Falls power development project. The Aroostook Valley Rd. is at present in operation as an electric railway between Presque Isle and Washburn, Me., about nine miles. The company has a charter authorizing the purchase of the C.P.R. Aroostook branch and the extension of the existing line from Washburn to the western boundary of the State, a little over 80 miles. This route, as projected, passes a short distance south of Fish River Lake, crosses the Allegash River south of the falls, and proceeds by way of Umkaskers and Round Lakes to the International boundary in the vicinity of Frontier Lake. Here it is proposed to make connection with a line to be built from Quebec, which it is generally understood is the Quebec and St. John Ry., which was originally projected from Quebec to near Edmundston, and thence via the valley of the St. John River to St. John, but which subsequently had the route changed for one from Quebec to the International boundary. It is claimed that by the use of this combined route, the shortest possible line will be obtained between Quebec and St. John. (See St. John Valley Ry., Jan., pg. 23.)

The Kent Northern Ry., which runs from Kent Jct., on the Intercolonial Ry., to Richibucto, N.B., 27 miles, is said to have been sold to Toronto parties.

Transportation, from a Railway Superintendent's Viewpoint.

By U. E. Gillen, Superintendent, Middle Division, Grand Trunk Railway.

The word "transportation" is defined as the act of transporting, conveying or carrying something from one place to another. When a member of a railway club, or a person engaged in railway service, hears or thinks of the word transportation, he is apt to think, by reason of his association or employment, that it means the moving of passengers, mail or express, package or carload freight by a steam locomotive.

If he considers what mind conceived the idea, his thoughts revert to those whose genius has done so much for transportation, among others, Geo. Stephenson, who is credited with having invented the first successful steam locomotive in 1815; S. F. B. Morse, who invented the telegraph in 1835; Geo. Pullman, who invented the car bearing his name in 1863; Geo. Westinghouse, who invented the air brake in 1869; A. G. Bell, who invented the telephone in 1876; and if in Canada, he is also likely to think of the man at the head of each of the three leading railways of the Dominion, each of whom has done much in the way of providing good transportation facilities.

The transportation rules in use on the principal Canadian railways have been approved by the Board of Railway Commissioners. Each class of employes governed by those rules is required to commit to memory and write correctly the answer to each question in an examination book and pass a satisfactory oral examination before a competent rule instructor. In addition to the rules referred to a working timetable is provided for the government and information of employes only; it is the authority for the movement of regular trains subject to the approved rules, it contains the classified schedules of trains with special instructions relating thereto, and on single track designates trains in a certain direction, as indicated by timetable headings (unless otherwise specified) superior to trains of same or inferior class running in opposite direction.

The transportation department is the largest and perhaps the most important of the many departments on any large and well organized railway. We have evidence of this in our Government statistics, which show that, in 1910, the gross earnings of railways in Canada were $173,956,217.13; operating expenses $120,405,440.42. The latter amount is divided as follows:—

Transportation	48.94%
Way and structures	22.45%
Equipment	21.59%
Traffic expense	3.63%
General expense	3.39%

The principal transportation or operating officer usually has charge of maintenance and construction. This should be so, if for no other reason than that all work of maintenance and construction should be subservient to train movements.

The work of arranging train schedules, assigning car equipment, locomotives and men to the various trains, districts and terminals, the loading of locomotives over each district, in each direction, having due regard to the class of locomotives used, the weather conditions, the class of train to be handled, the maximum gradient over which the load is to be hauled; the shifting of locomotives and train crews from one terminal to another with a view to providing a locomotive and crew so that all regular trains can leave on time; also for extra trains as fast as enough cars accumulate for a full train or the business offered justifies the running of a train short of full tonnage, and at the same time give men sufficient rest, eight hours out of every 24 and avoid keeping a man on duty more than 16 hours, or a locomotive, locomotive crew or train crew at a foreign terminal longer than necessary to make running repairs to locomotive and allow men sufficient rest, investigate the cause of any delay to a train which prevents it from making schedule time, investigate the cause of accidents of every description directly or indirectly due to, or connected with a locomotive or car movement in yard or road service (take immediate action, so far as it is possible to do so, to avoid similar delays and accidents), make wire and written reports to general officers regarding delays and accidents, examine new employes as to their qualifications, instruct employes in their duties, and assign them to their various positions. This is a part of the daily work

P248 U. E. Gillen,
Superintendent, Middle Division, Grand Trunk Railway.

of a transportation or operating officer who is on the firing line, that is, the man whose jurisdiction is confined to one or more districts or a division, and the greatest degree of success cannot be obtained without system, supervision, organization and co-operation.

SYSTEM.—In order that the best use may be made of every locomotive, and that cars may be moved without unnecessary delay, it is important that some system be used to keep posted as to the location of every locomotive, the total number of loads and empties at each station to move, the direction they move and whether or not they are through cars or local cars.

The different classes of service can be provided most economically and satisfactorily if a certain type of locomotive is assigned to a certain train or service, it is, therefore, obvious that much care must be exercised in the assigning of locomotives, and in order to properly assign or provide a locomotive you must readily recognize its class by the number and know the location of every locomotive at any hour of the day or night.

Different methods have been adopted by different officials for obtaining the necessary information about locomotives and cars. The method or system which the writer is most familiar with and regards as most satisfactory and complete, provides for a careful check and record of each locomotive twice daily. The report is compiled in the train dispatcher's office and shows the number of every locomotive recorded on train sheet that is on the road at the time report is compiled, and the terminal to which the locomotive is destined. In addition to this a report is received from each locomotive foreman on the division, giving the numbers of all locomotives at his terminal, the numbers of all locomotives available or for which order has been accepted, the numbers of locomotives in yard, transfer and pilot service, the numbers of locomotives crippled that will be out of service more than 12 hours, and the numbers of locomotives under repair that will be available for service within 12 hours. The numbers thus collected, plus those in big shop, will correspond with total assignment. At the same hour information is collected from locomotive foreman about locomotives, the general yardmasters at all terminals and the agent at principal junction points and stations make a report of the number of loads and empties on hand to move and their destinations. The information is transmitted by the use of symbols with the view of imparing the information by using the least number of telegraph characters.

Example:—"A" means all locomotives at the terminal.
"B" means all locomotives available or for which order has been accepted.

In compiling the report the sender would say "A" 1, 2, 3, 4, and 5, "B" 2 and 4, the figures indicating the numbers of the locomotives.

As to the time these reports should be compiled. I consider the best results can be obtained if reports show the conditions at 5 a.m. and 5 p.m. The train dispatcher, chief train dispatcher, trainmaster, superintendent, or anyone who is directly interested in, and responsible for moving cars and handling locomotives, is then in a position to know the situation immediately after coming on duty in the morning and shortly before leaving the office at night.

The car situation at the smaller telegraph stations is known by referring to the daily telegraphic car report, which shows the loads and empties on hand to move and the direction they move, the number and kind of loaded cars on hand to be unloaded, the number and kind of empty cars required for loading. The same information is obtained from non-telegraph stations by having the conductor of the wayfreight train in a specified direction wire the report from the first open telegraph office.

SUPERVISION.—No man, no matter in what capacity he is employed, whose duty it is to plan, direct, or supervise, should be burdened, as many are, with a class of work that could and should be done by a cheaper man.

ORGANIZATION of forces is highly essential, in order that a united effort may be made to accomplish the same result.

CO-OPERATION of the various departments means success for every department, which is most desirable.

The transportation department men should be, and I believe are, strong advocates of co-operation; they are dependent on the locomotive department for locomotives, and on the car department for cars; without engines and cars they are helpless.

The transportation department is charged with the responsibility for the

proper assigning and handling of locomotives and the moving of cars. Every locomotive and car out of service when needed increases the operating expenses, therefore, I think, the locomotive department should be assessed for every locomotive failure, also for every locomotive held out of service beyond a reasonable time. The car department should be assessed for every car breaking down in service, under fair usage, or held out of service beyond a reasonable time, and the amounts credited to the transportation department. I also think the fuel department should be assessed and the various departments credited with every item of expense directly or indirectly chargeable to poor coal. I say various departments, because I have known of serious damage to locomotives and cars resulting in interruptions to traffic, directly due to poor coal, and, perhaps, indirectly due to neglect on the part of certain employes under very extenuating circumstances.

The cost of operating is constantly increasing, due to increase in wages and increase in cost of materials used by railway companies. It has been said the increased expense is offset by the increased business. The facts are, according to the Railways and Canals Department report for a period of 12 years, 1899 to 1910, inclusive, the earnings per train mile increased 70.8%, and during the same period the cost of running a train one mile increased 80.8%. The average cost per train mile in 1899 was $0.779; in 1910, $1.409. In 1910 the average revenue per passenger per mile was 1.866 c.; this rate was .055 below the figures for 1909. The average revenue per ton per mile, which is accepted as representing the freight rate earned by all railways combined was .739 c.; this was .012 higher than the rate for 1909; it was also .067 lower than the rate for 1907. The aggregate passenger revenue for 1910 was $46,018,879.56; the number of passengers handled was 35,894,575. The average revenue per passenger from ticket sales was $1.282; revenue from freight amounted to $116,229,894.06; tons hauled was 74,482,866. The freight handled is classified as follows:—Products of agriculture, 17.31%; products of animals, 3.71%; products of mines, 35.11%; products of forests, 17.54%; manufactures, 13.44% merchandise, 3.39%; miscellaneous, 9.50%. The same authority tells us that 12 roads showed net earnings amounting to $52,041,937.00, or 97% of the total for all lines in Canada; also that 24 railways in Canada in 1910 showed a deficit or managed merely to make ends meet.

These figures and statements reflect and emphasize the necessity for economy. How railways can economize without impairing the service is worthy of our best thought. The cost per train per mile cannot be reduced under existing conditions; it will likely continue to increase; the average tons per car is 17.13; average cars per train 18.15; average tons per train 311. Can we not increase the load per car and cars per train, thereby reducing the number of cars in service and trains run, without detriment to the service? I believe we can, and as the majority of the lightly loaded cars are those containing package freight, l.c.l. shipments, usually handled by wayfreight trains, let us consider them first. It is not infrequent to see a wayfreight train start out of a terminal with l.c.l. shipments in half a dozen or more cars loaded at as many different places; the tonnage and shipments in those cars could probably be handled in about half the number of cars if the shipments were carefully loaded, and with the view of getting all shipments for the same place in one car and in the order in which the various stations are reached; it would save cars, overtime, loss and damage to freight. The suggested reloading and transhipping should be done by the station staff at the terminal from which the wayfreight train starts.

Are the through lines not running more trains than necessary to properly handle the business, and if so, why? The average number of cars per train and average tons per train indicate that many locomotives are handling less than two-thirds of a load, and I believe the principal reason is, to move at a high rate of speed certain shipments that represent but a small percentage of the total tonnage handled.

All manifest trains are run at reduced tonnage, and on some through lines, so many manifest trains are run that it is seldom necessary to run a through dead freight train. Does the business warrant the railway companies in providing such expensive service, and do the consignor and consignee make the same effort to expedite the movement of such shipments? I think not. A recent check of 100 cars of fruit showed that the consignee used on an average more than five days per car in unloading, and a recent check showed that an average of more than seven days per car was used in unloading 100 cars of team track delivery freight, other than perishable shipments, calendar days counted in each case.

The yardmaster's idea is to get the cars out of his terminal with as little delay as possible, without due regard for the work necessary to get the train through the next terminal. In many cases time and money would be saved by holding cars at the first terminal 10 or 12 hours, or, if necessary, 24, to get enough cars for a through train, a train that would pass several terminal points without having to set out or pick up a car except to reduce or add to the tonnage of the train; the time lost at the initial terminal would frequently be more than offset by the saving effected in switching at several different terminals.

The present practice of not advising consignee about his shipment until it arrives at destination, and then allow him 24 hours to give placing order causes delay to car and shipment; it also frequently results in heavy expense in switching movements that could be lessened or entirely avoided if cars for a given point were handled in train lots, the billing reference wired or telephoned to the agent at destination, and placing order obtained prior to the arrival of car.

The foregoing paper was read before the Canadian Railway Club in Montreal recently.

Branch Lines in the Maritime Provinces.—Hon. H. R. Emmerson, M.P., ex-Minister of Railways, brought before the House of Commons, Jan. 10, a resolution favoring the taking over such of the various branch lines now connected with the Intercolonial Ry. as would serve as direct and profitable feeders of the same. The Minister of Railways in a general way endorsed the principle of the resolution, and said: "The Government will be prepared to take them over after investigation to find out what branch lines on the I.R.C. can be taken over that will become feeders of that road, and not milkers of it. It will take them over on a fair and equitable basis.

Railway Lands Patented. — Letters patent were issued during Nov., 1911, in respect of the following railway lands in Manitoba, Saskatchewan, Alberta and British Columbia:—

	Acres.
Calgary and Edmonton Ry.	640.00
Canadian Pacific Ry.	19.54
Grand Trunk Pacific Ry.	46.89
Qu'Appelle, Long Lake and Saskatchewan Rd. and Steamboat Co.	1,286.00
Total	1,992.43

Canadian Northern Railway Earnings, Expenses, Etc.

Gross earnings, working expenses, net profits, increase or decreases, compared with those for 1910-11, from July 1, 1911 :—

	Earnings.	Expenses.	Net Earnings.	Net Increase
July	$1,475,900	$1,114,300	$361,600	$13,400
Aug.	1,420,600	1,105,900	314,700	51,700
Sept.	1,576,400	1,157,000	419,400	38,200
Oct.	2,028,900	1,348,500	680,400	99,900
Nov.	2,001,500	1,336,300	665,200	106,300
	$8,503,300	$6,062,000	$2,441,300	$309,500
Inc.	$1,712,100	$1,402,600	$309,500	....

Approximate earnings for December, $1,831,400, against $1,255,400 for Dec., 1910; approximate earnings for two weeks ended Jan. 14, $530,600, against $372,000 for same period 1910.

Canadian Pacific Railway Earnings, Expenses, Etc.

Gross earnings, working expenses, net profits, increases or decreases, compared with those for 1910-11, from July 1, 1911 :

	Earnings.	Expenses.	Net. Profits.	Net Increase
July	$ 9,661,818.14	$5,958,789.81	$3,703,028.33	$218,408.74
Aug.	10,421,904.42	6,346,333.41	4,075,571.01	383,898.68
Sept.	10.049,084.97	6,131,638.17	3,917,446.80	5,847.16
Oct.	11,207,991.99	6,526,887.24	4,631,104.75	175,944.23
Nov.	10,570,694.80	6,583,328.31	3,987,366.49	250,244.23
	$51,911,494.82	$31,546,976.94	$20,364,517.38	$1,034,343.84
Inc.	$4,829,125.67	$3,794,782.63	$1,034,343.04	.....

Approximate earnings for December, $10,568,000 against $8,603,000 for Dec., 1910; approximate earnings for two weeks ended Jan. 14, $2,951.000, against $2,503,000 for same period 1911.

The mileage operated was increased during December to 10,832.

Grand Trunk Railway Earnings, Expenses, Etc.

The following figures show the earnings and expenses of the G.T.R., C.A.R., G.T. Western Ry. and D.G.H. & M.R. for Nov., 1911, as compared with those for Nov., 1910:—

GRAND TRUNK RAILWAY.

	1911.	1910.
Earnings	$3,152,800	$2,989,500
Expenses	2,489,200	2,340,100
Net earnings	$ 663,600	$ 649,400

CANADA ATLANTIC RAILWAY.

	1911.	1910.
Gross earnings	$ 188,100	$ 176,700
Expenses	163,800	138,800
Net earnings	$ 24,300	$ 37,900

GRAND TRUNK WESTERN RAILWAY.

	1911.	1910.
Gross earnings	$ 534,200	$ 477,100
Expenses	424,600	427,800
Net earnings	$ 109,600	$ 49,300

DETROIT, GRAND HAVEN AND MILWAUKEE RY.

	1911.	1910.
Gross earnings	$ 226,000	$ 202,200
Expenses	160,000	136,000
Net earnings	$ 66,000	$ 66,200

TRAFFIC RECEIPTS OF THE SYSTEM.
Aggregate from July 1 to Dec. 31:—

	1911.	1910.
Grand Trunk Ry.	£4,133,320	£3,696,455
Canada Atlantic Ry.	225,032	199,456
Grand Trunk Western Ry.	704,053	627,425
Detroit, Grand Haven and Milwaukee Ry.	252,834	218,388
Totals	£5,315,239	£4,741,724

It has been decided, commencing with the January statement, to include in future monthly revenue statements, the balance of income from rentals, outside operations and hire of equipment, the balance of revenue from these sources having been previously shown in the half yearly accounts, but not included in the monthly revenue statements.

The Temiskaming and Northern Ontario Ry.'s Porcupine branch is reported completed to Schumacher, in the Pearl Lake district.

The Quebec and Saguenay Ry. is being sued by J. Slevin, for $17,500 damages alleged to have been sustained through the railway running its line over his property without an agreement having been previously reached.

Rebuilding the C.P.R. Bridge over St. Lawrence River at Lachine.

The major portion of the new bridge being constructed across the St. Lawrence River at the Lachine rapids has been completed, and it is expected to finish the work in the coming summer.

Traffic on this portion of the line—the section from Montreal to Farnham on the main line to St. John, N.B., and Halifax—has increased tremendously, not alone due to the great expansions of the C.P.R., but also to the increased business handled by the St. Lawrence and Adirondack Ry. and the Rutland Rd., two units of the New York Central Lines, which also reach Montreal over this Lachine bridge. These conditions made it imperative to double-track the line from Montreal to Farnham if the traffic was to be handled expeditiously. This included double-tracking the bridge.

The old bridge, nearly three-quarters of a mile in length, was erected in 1886, a year after the completion of the transcontinental line, and was then considered a most remarkable feat in bridge-building. Webster's Dictionary cites it as an example of cantilever bridges, while an article in a magazine of 1888 describes it as "a remarkable structure, light, airy, graceful, with many interesting features." But, while sufficient to meet all requirements of that time, 26 years ago, rolling stock has increased in size so greatly during that period that the capacity of the bridge was not considered sufficient, resulting in its replacement entirely by a complete new double-track bridge of a heavier and more modern construction, designed by P. B. Motley, M. Can. Soc., C.E., Engineer of Bridges, C.P.R.

A little consideration will emphasize the big task undertaken in this project. The bridge is located at the upper end of the Lachine rapids, crossing between Lachine and the Indian village of Caughnawaga. At this point the current is quite rapid, running up to 8 and 10 miles an hour, even exceeding this in the spring when the ice floes come down. These difficulties were successfully overcome, work having been continuously pushed forward for more than a year, through the winter season. To facilitate work as much as possible the pier additions were all made on the downstream side.

The original bridge had 17 spans from the Lachine end as follows: 3 shore girders 80 ft. long, 7 ft. deep; 8 river girders 240 ft. long, 35 ft. deep; franking span 270 ft. long; 2 cantilever spans 407 ft. long; franking span similar to the other side of cantilever, and 1 girder 240 ft. long, 35 ft. deep. It was decided to change the design to the extent of making the first four 240-ft. spans on the Lachine end into eight 120-ft. spans by building new abutments as shown in figs. 2 and 3, and by replacing the two cantilever spans by heavy girders. Building new piers at the Lachine end to shorten the spans was considered the best plan, for at that end of the bridge the water is shallow, the navigable section of the river being beneath the cantilever spans of fig. 1.

The plan adopted at the Lachine end for building the piers, was to drive piling around the place for the pier, forming a cofferdam, and after removing the water, to build up a concrete foundation to water level, on which the masonry was laid. This concrete foundation extends 18 ins. beyond each side. The new piers were built as complete as possible, around the old 240 ft. spans bridge, and the extension of the old piers in a similar manner as indicated in fig. 2. The building of the piers in deep water is shown in fig. 4.

A different method of building the piers was followed in the deeper water. A caisson was sunk at the outer point of the new section of pier, and from this outer stationary point, a coffer dam was built around to the existing position of the pier, work proceeding as before.

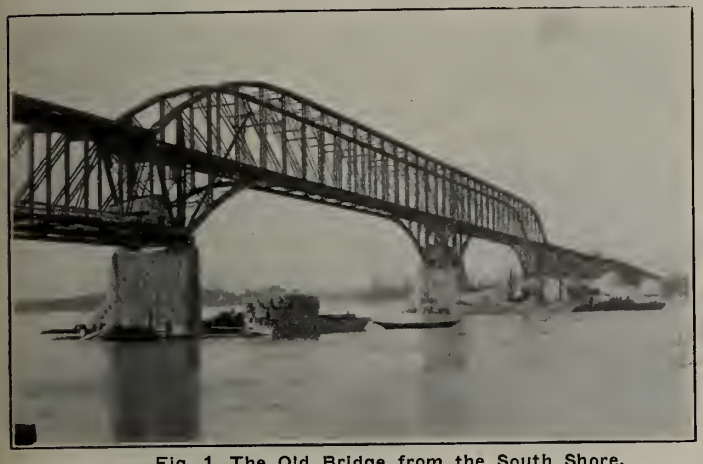


Fig. 1. The Old Bridge from the South Shore.

Fig. 2. New and Old Bridges from the Lachine Shore.

The first steel work was done for the Lachine end, up to which point the line had been double-tracked, facilitating the removal of work train, crane, etc. A light truss of the form shown on the further track of the first span in fig. 3 was built across on the piers to be spanned. This formed a temporary supporting beam, on which the permanent beam was built up piecemeal. When completed, this temporary truss was taken out and moved to the next span. Construction work was carried on by a heavy travelling crane on the existing bridge. This procedure was followed until the eight 120-ft. spans were completed. Traffic was then diverted on to this new section of the bridge, a cross-over near the end of the new section carrying the tracks back to the old section not yet replaced. The old spans were then removed, a temporary span being also employed for this purpose. The piers up to this stage are shown in fig. 5.

An ingenious method of constructing and placing the new spans was adopted, the method being shown in fig. 6. Each girder of the span is built up separately on the piers, close alongside the existing span where it is easy to get at the parts while being built together.

Fig. 3. Construction Work with Old Spans Removed.

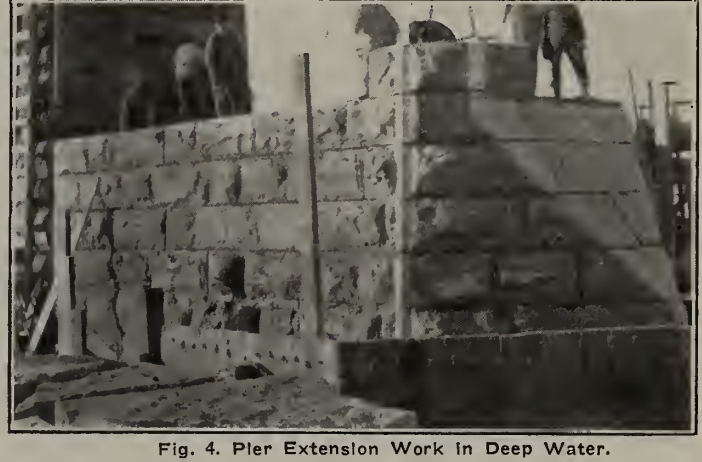


Fig. 4. Pier Extension Work in Deep Water.

On completion, by means of a block and tackle from the end of a projecting pole (fig. 6), the girder, supported on rollers, is rolled out to its location, and the inner girder built in the same location.

The Foundation Co. built the piers, and the Dominion Bridge Co. had the contract for the steel work. The latter company, having its construction works near by, needed no field shop. The Foundation Co., however, has quite an extensive shop on the south side of the river. As shown in fig. 1, there is a small industrial railway running out to the first water pier, supported on the

Fig. 5. New Spans and Uncompleted Piers, looking towards Lachine Side.

Fig. 6. Method of Locating Outer Girders of New Spans.

lower chord of the existing truss. On the Lachine end, there is a more elaborate system of staying out to the new piers, where more work was done. A couple of tugs and several scows were used for the carrying back and forth of materials for the isolated piers.

Work on the balance of the bridge, including the replacing of the cantilever spans, will be completed in the spring. All the work is being carried forward under J. H. Barber, M. Can. Soc. C.E., of the C.P.R.'s engineering department.

White Pass and Yukon Railway Company's Annual Meeting.

At the recent annual meeting of the company, in London, Eng., apology was made for the late date at which the meeting had been called, which was due to the hope that the proceedings regarding rate matters, now before the Board of Railway Commissioners, would have been concluded. The report showed that income tax was about £1,000 higher than in 1910, and that the dividends on shares in the local companies were about £8,000 less, and the profit for 1911 about £7,500 less than in the previous year. The sinking fund is now about £183,000, against £157,000 in 1910, the net profit being £40,871. Deducting from this, £18,285 for the sinking fund and £13,750, representing a dividend of 1% on the ordinary shares, there is a balance of £8,836, which is carried forward to the current year's accounts.

C. C. Macrae, Chairman, in referring to the rate question at present being dealt with by the Board of Railway Commissioners, said he thought it wise to say as little as possible while the matter was sub judice. The position was, that last spring the Board made an order, which, if enforced, would have had a serious effect on the local companies. Proceedings were taken to have the order reversed, and eventually an order for a re-hearing was granted. This was fixed to take place in November last, and took place on Dec. 6, after an adjournment in consequence of the death of the President, S. H. Graves, and it was later adjourned to Jan. 22 to enable another petitioner's case to be heard. He believed that the orlginal order was made under a misapprehension of the governing facts, and hoped that the outcome of the hearing would be that the Board had no intention to deprive the capital invested of a fair and reasonable return, having regard to the risks run, and to all the conditions pertaining to the construction, maintenance and operation of a railway in semi-arctic regions.

O. L. Dickeson, whose appointment as President, in succession to the late S. H. Graves, was announced by the Chairman, said that the gross earnings were down owing to the unsettled state of the Dawson market, due to the pending decision of the Board of Railway Commissioners on the question of rates, but although the gross earnings were lower, the net receipts had not decreased in the same ratio. By increasing the number of boats, the company had been enabled to carry all the tonnage to its destination, and it was encouraging to know that negotiations were under way, whereby the company expects to furnish oil fuel for dredge operations to take the place of the diminishing supply of wood.

C. C. Macrae and E. F. North were re-elected directors for the current year.

British Columbia's Railway Policy.

In an interview at Victoria, Jan. 8, Premier McBride is reported to have stated that the Government's railway policy would be announced in the course of a few weeks. This statement was made in reply to a deputation which waited upon the Government to urge the importance of building a line from Vancouver to the Peace River district, in support of which project public meetings have been held in Vancouver and other places in the province during the past three months.

The Legislature opened Jan. 11, and press dispatches state that the Government policy includes the building of a line to connect Vancouver with the northern parts of the province. The question whether the line will be built and operated by the Government has not been definitely settled, but as several companies already hold charters covering the territory, it is probable that the Government will build the line and arrange for its operation. It is reported that three firms have been negotiating with the Government for the building of the line. (See Vancouver and Peace River Ry., Jan., pg. 23.)

The Canada and Gulf Terminal Ry., R. Dupont, Traffic Manager, has been admitted to membership of the Eastern Canadian Passenger Association.

The Railway to Hudson Bay.

The Dominion Parliament has voted $1,166,666.66 on account of construction work on the railway from Pas Mission to Hudson Bay, a contract for the building of the first section of which has been let to the, J. D. McArthur Co. Winnipeg.

J. D. McArthur, in an interview at Winnipeg recently, stated that there would be no disturbance of the contract he had for the building of the first section of 185 miles of the line from Pas Mission. As the result of his interview with members of the Government, he would have a large force of men at work during the winter cutting out the right of way, and getting in supplies. In the spring the grading gangs would be sent out to begin the actual work of construction.

Work has been resumed by Mackenzie, Mann and Co. on the construction of the bridge across the Saskatchewan River at Pas Mission. The piers to carry the superstructure have been completed, and the plant and material for the steel spans were reported as being in transit, Dec. 30.

Speaking at Winnipeg, Dec. 29, the Minister of the Interior is reported to have said that the project would certainly be carried out.

J. D. McArthur had a further conference with the Minister of Railways, at Ottawa, Jan. 12, and the Minister stated in the House of Commons, Jan. 16, that he had under consideration an alternative route for the line. The Government had not yet ascertained whether Fort Churchill or Port Nelson was the better harbor on Hudson Bay, but in view of the urgency of the work and unanimity of opinion endorsing it, he had ordered construction to proceed. He believed, however, that another expedition would be necessary to definitely settle the harbor question. He had no doubt that the line could be built within two or three years. He had another project in view if the Hudson Straits were not found satisfactory for the running of boats. There would, he said, be two strings to the bow by establishing a line of boats from the port chosen across James Bay to the Nottaway River in Quebec, by which grain could be transferred to the National Transcontinental and shipments made from Atlantic ports. This, the Minister pointed out, would cut the haulage distance from Prince Albert and such points in the west by over 600 miles.

A deputation from Prince Albert, Sask., waited on the Government, Jan. 12, and asked for the building of a line from Prince Albert, Sask., to Split Lake, the terminal point of the section of the line under contract from Pas Mission. Consideration of the proposal was promised.

RAILWAY DEVELOPMENT.

Projected Lines, Surveys, Construction, Betterments, Etc.

Alberta Central Ry.—The Board of Railway Commissioners has approved location plans for the main line from mileage 100 to 140 west of Red Deer, Alta., and for the location of a branch from mileage 135 on the main line to the Big Horn Range coal fields, 28 miles.

We are officially advised that the Alberta Central Ry. has been taken over by the C.P.R.

The Alberta, Peace River and Eastern Ry. Co. is applying to the Dominion Parliament to extend the time within which it may build its projected railway. Grand and McCarthy, Ottawa, are solicitors for applicants. (July, 1910, pg. 547.)

Algoma Central and Hudson Bay Ry.—We are officially advised that during 1911 the company laid track on the extension of its line between Pangissin and Hobon, on the C.P.R. transcontinental line, as follows:—From mileage 81.6 to 99, a distance of 17.4 miles, and between mileage 115 and 153, a distance of 38 miles. It also completed the work on the branch line from Magpie Jct., on the Michipicoten division, to Magpie Mine, 9.42 miles; and laid about 10 miles of sidings, including yard track, at Sault Ste. Marie, Ont. The work on the main line to the C.P.R. transcontinental line is expected to be completed by August next. Progress is also being made on the extension of the line from Hobon, on the C.P.R., to the National Transcontinental Ry., 99.16 miles, and this work it is expected to have completed by Aug., 1913. The contractors are the Superior Construction Co., Espanola, Ont., the principals of which are T. J. Kennedy, Espanola, and J. D. McArthur, Winnipeg. A reconnaissance survey has been made for a further extension of the line from the National Transcontinental Ry. to Hudson Bay. (Jan., pg. 21.)

Bagotville and St. Lawrence Ry.—The Quebec Legislature is being asked to incorporate a company with this title to build a railway from Bagotville to Murray Bay or Baie St. Paul, Que., and from one or other of the two latter places by the most direct and advantageous route to Quebec. L. A. Cannon, Quebec, is solicitor for applicants.

British Columbia and Dawson Ry.—The company in an amended notice is asking the Dominion Parliament to extend the time within which it may build the lines authorized to be constructed by the act of incorporation of May, 1911, and to build three branch lines. The only variation from the previous notice is that the third line is to be from Vancouver to the main line at or near Lillooet. (Jan., pg. 21.)

British Pacific Coal Fields Co.—In connection with the development of the company's property on Graham Island, it is reported that a line of 1.5 miles will be built from the collieries to a deep water port. W. G. McMorris is Managing Director.

Bruce Mines and Algoma Ry.—Application is being made to the Ontario Legislature for authority to build a line from Rydal Bank station northerly and easterly to Hannah Bay, or other point on James Bay, Ont.; to build branch lines not exceeding 12 miles in length, and to extend the time within which the already authorized lines may be built. Lennox and Lennox, Toronto, are solicitors for the company. (July, 1911, pg. 645.)

Canada and Gulf Terminal Ry.—No new construction was undertaken during 1911. The company has under consideration the extension of its line from Matane, the present terminus, to Gaspe Basin, Que., 189 miles, and from St. Flavie, the junction with the Intercolonial Ry., to St. Eleuthere, near the Quebec-Maine boundary. (June, 1911, pg. 505.)

Central Ry. of Canada.—A Montreal dispatch of Jan. 21 says:—"It is announced that preparations are complete for the building of this line, and that the first section from Montreal to Ottawa will be completed by the end of this year, while the further portion, from Ottawa to Georgian Bay, will be built shortly after. The company has changed its original plan, and the route, instead of passing through St. Benoit, will follow along the shore of the Lake of the Two Mountains, passing through St. Placide and Oka, crossing from the mainland to Ile Jesu at St. Eustache, and reaching the Island of Montreal at Cartierville. It will then parallel the Riviere des Prairies, crossing the C.P.R. tracks at Jacques Cartier Jct., and reaching the Harbor Commissioners' line on the waterfront at Tarte pier. This will be the freight entrance into the city. A passenger entrance is planned from the west, and it is expected that the terminus will be the G.T.R.

Churchill and Athabasca Ry—Application is being made to the Dominion Parliament to incorporate a company with this title to build a railway from Fort Churchill, on Hudson Bay, westerly to Lake Athabasca, Alta. Bishop, Pratt and Delavault, Edmonton, Alta., are solicitors for applicants.

Dominion Atlantic Ry.—The Board of Railway Commissioners has approved revised location plans for the line from the west side of St. George St., Annapolis, N.S., to the west side of Allen's Creek, 2790.5 ft., and for the rebuilding of the bridge across Allen's Creek, (Dec., 1911, pg. 1137.)

Edmonton, Dunvegan and British Columbia Ry.—We are advised that the press reports that a contract had been let to G. H. Webster, Calgary, Alta., for the construction of the first section of this projected railway were premature, that the matter is not yet definitely settled, but that it is expected a decision will be reached early in Feb. T. Turnbull, Edmonton, Alta., is Chief Engineer. (Jan., pg. 21.)

Esquimalt and Nanaimo Ry. — The first through train over the extension to Port Alberni was run Dec. 20, R. Marpole, Vice President, taking a party of C.P.R. officials, including Vice President Bosworth, over the line.

The Board of Railway Commissioners has approved location plans for the extension projected from Black Creek to near Duncan's Bay.

Several conferences have been held between the railway, municipal and provincial authorities as to the disposal of the portion of the Songhees reserve, Victoria, which has been reserved for railway terminal purposes. The C.P.R. interests claimed to have premier rights, but the Premier said the matter must start anew. A union terminal is favored, and —. Holman, who designed the terminals at Seattle, Wash., has been authorized to draw up plans for a union terminal. (Jan., pg. 29.)

Fraser River Bridge.—The Minister of Public Works for British Columbia, speaking at Vancouver recently, said the Government railway bridge over the Fraser River at New Westminster was spoken of as a "white elephant" when it was first built. But the traffic over it has increased so largely that the question of building another bridge to accommodate the Great Northern Ry., and the other railways that were heading towards Vancouver, would have to be considered in the near future. Unfortunately the pres nt bridge had been so planned that it would be impossible to add more trackage, consequently a new bridge would have to be built. (See Fraser River Bridge, Mar., 1911, pg. 207.)

Fredericton and Grand Lake Coal and Ry. Co.—A meeting of directors was held in Fredericton, N.B., Jan. 10. In an interview, Sir Thos. Tait is reported as having stated that the railway will be built this year. Local press reports state that tenders for the building of the line are under consideration, and that it is likely a contract will be let at an early date. Sir Thos. Tait is reported to have purchased outright or to have acquired a controlling interest in additional coal areas in the district to be served by the projected railway.

We are advised that Sir Thos. Tait has taken over the company's charter and has been elected President. (Dec., 1911, pg. 1137.)

Ha Ha Bay Ry.—We are officially advised that track was laid during 1911 on the main line from Riviere du Moulin bridge to Laterriere village, Que., 10 miles, and that the building of a branch line from Mathias Jct. to Jonquiere village, five miles is under consideration.

A press report states the company has under consideration a project for the building of a line from Mathias Jct., Chicoutimi to Roberval, Que., about 125 miles. There is a charter for the building of a railway under the title of the Roberval and Saguenay Ry., and the section of the Ha Ha Bay Ry., already built, would, with the projected Mathias Jct.-Roberval section, give the connection between Roberval and the Saguenay River. (Oct., 1911, pg. 935.)

High River, Saskatchewan and Hudson Bay Ry.—High River and Hudson Bay Ry.—At a meeting of the Saskatoon, Sask., Board of Trade, Jan. 2, reference was made to this projected railway. The route proposed is from an at present unsettled point on the western boundary of Alberta, near tp. 15, northeasterly to Saskatoon, and thence to Pas Mission, connecting there with the Dominion Government railway to Hudson Bay. (Jan., pg. 21.)

Hudson Bay, Peace River and Pacific Ry.—A special meeting of the shareholders was called to be held at the offices, 408 McArthur Building, Winnipeg, Jan. 22, for the purpose of authorizing the sale of a further block of stock. H. W. Adcock is Secretary. (Dec., 1911, pg.. 1137, and Aug., 1911, pg. 733.)

Intercolonial Ry.—The Dominion Parliament has voted the following sums to be expended upon capital account:—

To increase accommodation	$ 14,583.33
To strengthen bridges	26,250.00
Truro, N.S., Increased accommodation	29,966.66
Mulgrave, N.S., Improvements	17,500.00
Moncton, N.B., Office building	28,291.66
Fredericton, N.B., Improvements	10,500.00
Campbellton, N.B., Improvements	15,750.00
Hampton, N.B., Spur line	8,750.00
New Glasgow-Guysboro, N.S., line	583,333.33
Dartmouth-Dean Settlement, N.S., line	583,333.33
Alva-Baddeck, N.S., line	116,666.66

(Jan. pg. 21.)

Kettle Valley Lines.—Application is being made by the municipality of Penticton to the British Columbia Legislature for an act confirming a bylaw granting a bonus to the Kettle River Valley Ry., for building its line in and through the corporation limits.

J. J. Warren, President, on a recent visit to Victoria, B.C., is reported to have stated that 30 miles of line at the Merritt end had been completed, and that construction had so far progressed on other sections that it was expected to have the entire line built by the middle of 1913.

Surveys are being made for the location of the projected line from Vernon to Penticton. (Jan., pg. 22.)

The Iron Range Ry. Co. is applying to the Ontario Legislature for an extension of time within which it may build the lines authorized to be constructed by chap. 277 of the statutes of 1908. Dowler and Dowler, Fort William, Ont., are the solicitors. (April, 1910, pg. 271.)

Joliette and Lake Manuan Colonization Ry.—Press reports, Jan. 11, state that construction is being proceeded with on a section of the line between Joliette and Lake Manuan, Que., and that it is expected to have about 60 miles of track laid by the end of the year.

The company is said to be considering plans for the extension of the line southerly to Montreal, and it is stated that the line will cross the Back River and enter the city by a route entirely new among the city's railway connections. (Jan., pg. 22.)

London and Port Stanley Ry.—Speaking at the inaugural meeting of the London, Ont., city council, Jan. 8, the mayor said he had reason to know that an offer would shortly be made by a company for the electrification of the line. The prospective offer was a reason why the city should take up the question of studying the matter of controlling the road directly, and making it an up-to-date radial line.

The line is being operated under a lease by the Lake Erie and Detroit Ry., the Canadian end of the Pere Marquette Rd., which lease is about expiring. It is said that the Lake Erie Coal Co. is the company from which the proposition to electrify the line will come, and that it desires simply to have the right to haul coal trains over the line, leaving the city free to make such arrangements with other companies for the operation of passenger and general freight trains as may be desirable. (Dec., 1911, pg. 1139.)

Michigan Central Rd.—We are officially advised that the work going on at the locomotive house at St. Thomas, Ont., consists of an addition of 16 stalls to the 24 built in 1910. This will make a 40 stall house. The work is about completed. The building is of concrete and brick, 95 ft. in depth, with the stalls spread 14 ft. centres on the inner circle. (Jan., pg. 22.)

Minnesota and International Ry.—Press reports state that arrangements are being made for the purchase of the line from Funkley to Kelliher, Minn., owned by the Crookstown Lumber Co., and its extension from Kelliher to Winnipeg, Man. It is also reported that new and heavier steel is to be laid from Brainerd to Kelliher this spring, and that when the entire work is completed the Northern Pacific Ry. will operate a direct and fast service between Minneapolis and Winnipeg. The M. and I. Ry. is a subsidiary of the Northern Pacific Ry., which owns or is interested in charters authorizing the building of a number of lines in Manitoba. (Dec., 1907, pg. 889.)

Minnesota, Dakota and Western Ry.—United States press reports state that it is proposed to build an extension of this line from Thief River Falls to International Falls, Minn., this year. The company has in operation a freight service over a line from International Falls to Lowan, Minn., 23 miles, and makes connection with the Duluth, Rainy Lake and Winnipeg Ry. at Falls Jct., Minn., and with the Canadian Northern Ry. at Fort Frances, Ont. E. W. Backus, Minneapolis, Minn., is President, and the head offices are at International Falls, Minn.

Montreal and Northern Colonization Ry.—Application is being made to the Quebec Legislature for an extension of time for the building of the line already authorized from Montreal to a junction with the National Transcontinental Ry. It is also desired to have power to secure an entrance into Montreal by means of a tunnel. (May, 1911, pg. 411.)

Montreal Transcontinental Ry.—Application is being made to the Dominion Parliament to incorporate a company with this title to build a railway from Montreal, northerly and northwesterly to the National Transcontinental Ry., at or near Lake Victoria, Que. C. L. deMartigny, Montreal, is solicitor for applicants.

Moose Mountain Ry.—The Alberta Legislature is being asked to incorporate a company to build a railway from about 3½ miles west of Cochrane, and 26 miles west of Calgary, westerly and southwesterly to the base of Moose Mountain, about 20 miles. Millican and Millican, Calgary, Alta., are solicitors for applicants.

The Mountain Park Coal Co., which has been incorporated under the joint stock companies act, with office at Edmonton, is applying to the Alberta Legislature for authority to build a colliery railway from its coal properties in tps. 45 and 46, ranges 23 and 24 west of the 5th meridian, to a junction with the Grand Trunk Pacific Ry.'s Alberta coal branch and the Canadian North Western Ry. Brazeau line, or either of them. Short, Woods, Biggar and Collisson, Edmonton, Alta., are the solicitors.

Ottawa, Abitibi and Hudson Bay Ry.—Application is being made to the Quebec Legislature to incorporate a company to build a railway from Hull northwesterly along the Coulonge River valley to the Grand Lake Victoria, thence to the National Transcontinental Ry., near Mattagami, and thence to James Bay. H. S. Ross, Montreal, is solicitor for applicants.

Ottawa, Montreal and Eastern Ry.—The Dominion Parliament is being asked for an extension of time within which the line and bridge or tunnel across or under the St. Lawrence River near Montreal, authorized to be built by chap. 141 of the statutes of 1910, may be constructed. Power is also sought to have the capital stock increased to $10,000,000. Laflamme, Mitchell and Chenevert, Montreal, are solicitors for applicants. (May, 1910, pg. 353.)

Prince Edward Island Ry.—The Dominion Parliament has voted the following sums to be expended upon capital account:—

Original construction	$ 583.33
Line, O'Leary to West Point	29,166.66
Line, Kensington to Stanley Bridge	58,333.33

(Jan., pg. 23.)

Quebec and Saguenay Ry.—Application is being made to the Quebec Legislature for an act to renew all the rights conferred on the company by chap. 55 of the statutes of 1906; ratifying and confirming the organization of the company, and all the acts of the directors prior to the passing of that act; declaring that the company may build a line from St. Joachim, near the terminal of the Quebec Ry., Light and Power Company's line, following the shore of the St. Lawrence River as far as Ste. Irenee and Malbaie, on to the Saguenay River, and across the same to the eastern boundary of the province, as well as branch lines; and extending for three years the time within which the line now being built to Murray Bay may be built, also extending for seven years the time within which the rest of the line may be built.

A. H. N. Bruce, Chief Engineer, is quoted as having stated in an interview Jan. 3, that surveys would be started at an early date for the location of the section of the line from Baie St. Paul to the Chicoutimi district, about 80 miles. The route will be through the primeval forest to Ha Ha Bay and the Grande Discharge. (Jan., pg. 23.)

Quebec Bridge Construction.—The Dominion Parliament has voted $1,166,666.66 on account of the building of the bridge across the St. Lawrence River near Quebec, and a further sum of $320,833.33 as a refund of the subsidies voted by the Quebec Legislature and the city of Quebec to the old Quebec Bridge and Ry. Co. in aid of the building of the bridge which collapsed. (Sept., 1911, pg. 831.)

Rat River Ry.—Application is being made to the Quebec Legislature to incorporate a company with this title to build a railway to be operated by steam, electricity or other motive power, from the copper mine of the East Canada Smelting Co. in Weldon tp., to St. Gerard, Que., on the Quebec Central Ry. Cate, Wells and White, Sherbrooke, Que., are solicitors for applicants.

Tobique Valley Ry.—A deputation from Windsor county waited on the New Brunswick Government. Jan. 4, and urged the subsidizing of an extension of the T.V.R. from Plaster Rock to Riley Brook. The company, under the title of the Tobique and Campbellton Ry., proposes to extend the line from Plaster Rock, via Riley Brook, to a junction with the International Ry. of New Brunswick. The section of the line at present built to Plaster Rock is operated under lease by the C.P.R., and it was stated that any further extension would be similarly operated. (See Tobique and Campbellton Ry. in C.P.R. Betterments, Oct., 1909, pg. 739.)

The Toronto, Hamilton and Buffalo Ry. built during 1911 two additional spur lines in Hamilton, Ont., viz.:—the Westinghouse spur, 0.42 mile, and the Grasselli spur, 0.57 mile. (Sept., 1911, pg.. 855.)

Winnipeg, Salina and Gulf Rd.—Press reports state that application has been made to the State Government of Kansas, for authority to issue bonds to provide funds for the building of the Kansas section of the proposed line from Kansas City, Mo., to Des Moines, New Mexico. It is also proposed to build a line from Omaha City to Oklahoma City, Okla. (See Midland Continental Ry., Sept., 1911, pg. 855.)

American Boiler Manufacturers Association.—The 24th annual convention of this association, together with its associate members, and the Supplymen's Association, will be held in New Orleans, La., March 12 to 15. Some very important papers will be presented, and there will be other important business of interest to all boiler manufacturers, and to supply houses dealing with the boiler and tank industry. An extensive programme of entertainment has been arranged, and a large number of boiler manufacturers and supplymen is expected to be in attendance. Information relative to rates, hotel accommodations, etc., will be furnished by F. B. Slocum, Secretary, Supplymen's Association of the American Boiler Manufacturers Association, Continental Iron Works, Brooklyn, N.Y.

St. Boniface Stock Yards—The Public Markets, Limited, is being organized in Winnipeg to take over and control the union stockyards at St. Boniface, Man. The company will represent the three railways, the shares being divided among them as follows:—C.P.R., 3,334; Canadian Northern Ry. and G.T. Pacific Ry., 3,333 each. The directors will be F. W. Peters, Assistant to the Vice President, for the C.P.R.; J. R. Cameron, Assistant General Manager for the C.N.R., and H. H. Brewer, General Superintendent for the G.T.P. Ry. It is expected that the yards will be opened for business by Oct. 1.

The Canadian Northern Railway's Montreal Entrance.

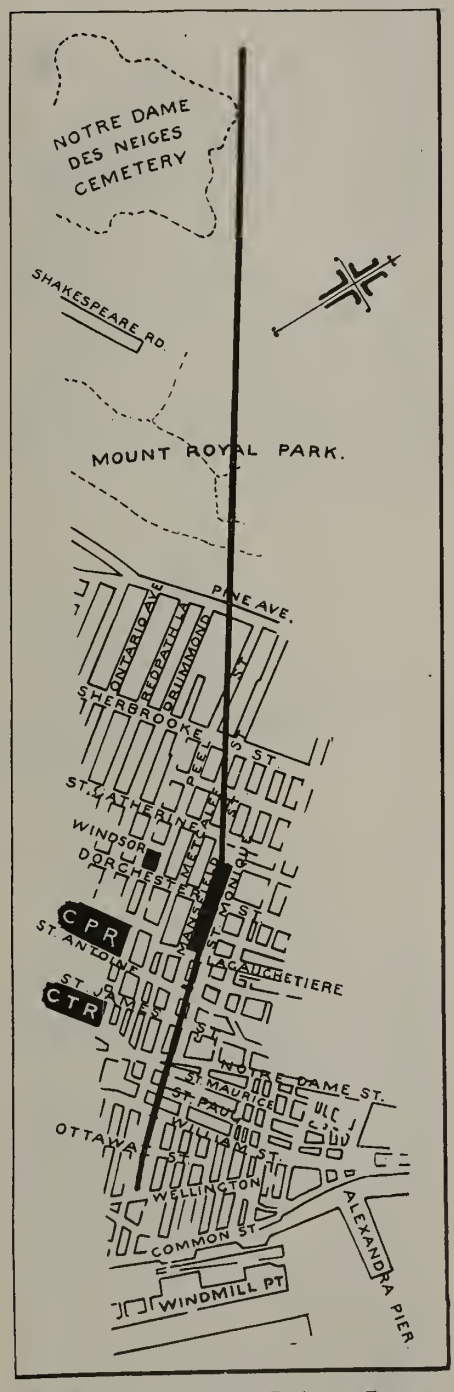
One of the many problems which the Canadian Northern Ry. management has had to solve in its very romantic history has been its entry into Montreal. The problem was this: Given two rich and powerful trunk roads firmly entrenched, one of them for over 50 years, the other for 25, how is a new and struggling railway only a little over 10 years old, scarcely known to the east, except as the owner and sponsor for some 600 or 700 miles of unprofitable road in the province of Quebec, to gain a foothold in a city where property is held for miles out from its centre at so many dollars per square foot, and where the level street crossing has been condemned for 20 years or more. To come in alongside the existing roads was a matter of prohibitive cost, and it meant only destruction to existing interests everywhere. Nobody wanted it or felt the need of it, and for ten miles out at least it would be only a dead line, incapable of creating any new traffic for itself or of sharing in the existing business.

Something better than this had to be looked for. It was possible to get into the outskirts of the city no doubt, but what chance was there in such a situation of competing with the two roads above mentioned, giving the best service perhaps that any city on the continent possesses—to Toronto, to Ottawa, to Winnipeg, to Vancouver, and to every point of importance which the Canadian Northern touches. It was a central location which the occasion demanded, or nothing at all. This was the problem presented to the C.N.R. staff, and the following is an account of how it was solved, and the various steps and arguments taken and used in the solution:—

The C.N.R. had a bridge over the Ottawa River at Hawkesbury, acquired through the Great Northern Ry. of Canada, and as the C.P.R. short line monopolized the south bank of the Ottawa to Vaudreuil, it seemed most reasonable that the line should use this bridge and come down from the west on the north side, especially as by doing so it would have a monopoly of the trade of several small towns, such as Carillon, St. Andrews, St. Placide, St. Benoit, and a portion of that of St. Eustache. Arrived at the latter point it was obviously essential to cross the Back River, skirt along it behind the mountain, and join the existing line out of the east end of the city, and through it get access to the freight yard in Maisonneuve and the Harbor Commissioners' transfer track.

This was obviously the first step, and in itself this gave the road a fairly good position from a freight standpoint, especially as the backbone of the island was crossed at a low elevation, and by gradients only one-third of those obtaining on the C.P.R., but this was no solution of the passenger traffic problem. No one would want to travel 118 miles from Ottawa, for instance, and be landed three miles from the centre of Montreal when he could go 112 on the C.P.R. and be landed directly at that centre. But the problem had become narrowed down. The data were now: A suitable spot in the centre of the city and a line running past at a distance of six miles or so. How can the two be connected? Any bright schoolboy would answer, "Drop a perpendicular from the point on to the straight line," and this is just what the Canadian Northern did, but the line crossed over a mountain top 800 ft. high. A bold spirit said tunnel it, but the financiers shook their heads and laughed. Where was the money to come from, and if it could be got, how was the interest to be paid by a struggling road even after it was completed? The question was a hard one to answer, and it was not fully answered until six years after, when the question had become urgent.

But in the meantime the following arguments had been presented and weighed. First, Montreal has grown continuously up and down the narrow strip between the mountain and the river until its length is ten miles, and its breadth less than two, a most awkward shape for a city. The wealthier residents, in their effort to get away from



The Canadian Northern Railway Entrance to Montreal, showing Station Site between Mansfield and St. Monique Sts.

the dust and smoke and heat, had climbed up the slopes of the mountain to the very top and gone out to Lachine and Dorval, and had even pushed past the end of the mountain at Snowdon and Outremont; but the beautiful western slope towards the Back River remained undeveloped, because inaccessible without a long ride of 40 minutes from the business centre. Obviously the tunnel when built would do more than bring the C.N.R.'s long distance traffic into town; it could be developed into a most important factor in the building up of a greater and more compact Montreal by bringing these desirable lands within ten minutes of the city's heart. This traffic would in itself probably be profitable, but further than this it was bound to enhance the value of the lands in question. Why should not the C.N.R. itself profit by the enhanced value. Why should the real estate men be the only gainers from a vast expenditure of money to which they would not contribute one cent? Here then was the key of the problem of financing, if only the lock would be found which it fitted, and the astute financiers very soon found the lock and opened the door of the financial safe. But this is a story by itself, and a romantic one, which will be told some day.

There were other arguments and other schemes more or less closely allied. It was proposed, for instance, to come in on the north slope of the mountain, where the cutting would be comparatively light, and where merely depressed tracks arched over with concrete and steel could be used. It was concluded that this would be cheaper, but an investigation did not show that this would be the case. It was contended that it would be more quickly constructed, but even this seemed to be doubtful, for the quicker construction depended on the work being started at and carried on from a number of different points simultaneously and this entailed the carting away of an immense quantity of material through the city streets for several miles—a matter of both great difficulty and expense. Another serious drawback was that this northern route led only to an uptown station north of Phillips Square, which meant a dead end station for all time, because continuation eastward towards the river meant crossing St. James St., and the district between it and the harbor at their very busiest and most congested portions—a matter of prohibitive cost and difficulty. As a matter of fact there was only one narrow belt which could be traversed, that is between the two existing railway terminals and Victoria Square, and this belt, butting up against the canal basin on the east, happened to be one of the most attractive situations for a freight terminal in all Montreal.

This last consideration settled the choice of route. The arguments could not be controverted, and this decision narrowed the choice of a terminal passenger station down to very small limits, viz., to a site near St. Catherine St. and somewhere between Dominion Square and Beaver Hall Hill. The existence of the big St. James Cathedral on the one side, and Birks', Rea's, and some other expensive buildings on the other, narrowed this still more; the offer of the large unbroken block of land to the east of Dorchester St., belonging to the Joseph estate, at a reasonable price, the existence of another block immediately west, covered almost entirely by second rate and old buildings, finally settled the matter and brought the choice of site to a focus.

A further consideration was the levels of the different streets to be crossed. Grade crossings of any of the main thoroughfares were not to be considered, either in the interest of the city or the railway, and it so happened that it was only on this line they could be well avoided. At the end of St. Monique St., for example, Lagauchetiere is about 40 ft. above St. Antoine, and St. James about 5 ft. lower. This admits of the line coming out under the former and above the second with a sufficient clearance, and over the third with a liberal margin. St. Antoine rises south, Lagauchetiere and St. James do not. So that

even the difference of a block would have made a great difference in this respect.

The above steps in the argument led then to the choice of route which may be briefly described as follows:—The line from Ottawa crosses the Riviere des Prairies, or Back River, near Ste. Dorothee, to the Island of Montreal and skirts along its east or right bank to Cartierville, where a large block of land has been secured for a divisional point and shops. It then goes on in the same direction to near Jacques Cartier Jct., where the freight line mentioned above leaves the tunnel line and proceeds to a junction with the C.N. Quebec Ry. line near the Montreal Locomotive Works at Longue Point. The tunnel line, of which the profile is shown herewith, deflects sharply to the right and ascends directly towards the centre of the mountain on a gradient of 40 ft. to the mile to a point about half a mile south from the C.P.R.'s Outremont yard, where the grade reverses its direction and carries the line under the tracks of the older road and into the heart of the old volcano. At this tunnel portal will be Northmount station, and it is probable that half a mile further on there will be a shaft and an elevator down to a subterranean substation somewhere near the St. Catherine's Road. From there on, the depth below the surface becomes very great, as much as 600 ft., but it may be considered commercially practicable in the future to sink a similar shaft from the lookout station in the Mountain Park, which would allow of the abolition of the present unsightly inclined railway up the north face of the mountain. The grade again approaches the surface at Sherbrooke St., where it is some 80 ft. underground, and at St. Catherine St. about 50 ft.

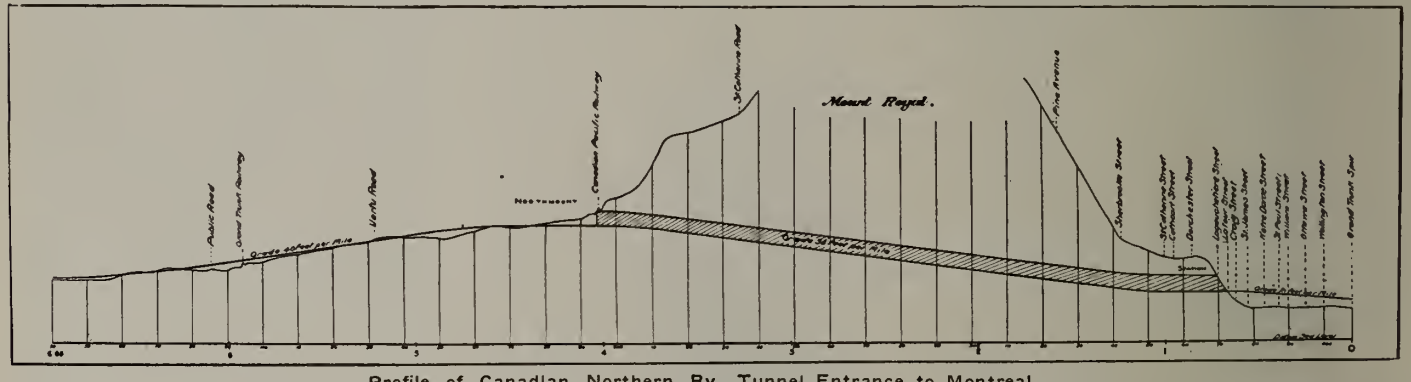
Between St. Catherine and Lagauchetiere Streets on the west and east, and between St. Monique and Mansfield Streets on the north and south, will be the main station, with tracks depressed, as above mentioned, 50 ft. below street level. The station will be exactly similar in principle to the Pennsylvania Rd. Station in New York City. The line will emerge into daylight immediately after crossing Lagauchetiere St. and will then run on a high level above St. Antoine, St. James, Notre Dame St. and other streets, to near the Lachine canal basin. A freight yard will be provided for between Nazareth and Dalhousie Streets. Practically the whole of the property required for these purposes has already been acquired by the company. An elevated freight yard seems at first sight a very extravagant arrangement, but when one reflects that the amount of material to be disposed of from the east end of the tunnel and station ground will be sufficient to fill an area of 10 or 12 acres to a depth of 20 ft. the arrangement will be seen to be one of economy rather than the reverse. The company's plans, however, are not entirely settled in this respect.

It will be seen from the foregoing that the company's plans, while bold and somewhat original, are by no means extravagant or fanciful. A subway has been talked about for years back, approximately along the line of St. Catherine St., to relieve the surface congestion and has now become a necessity. The scheme under discussion would, as far as its suburban traffic is concerned, be supplementary to this and is designed to pass under it. Provision will be made for the transfer of passengers from one to the other without their going out of doors at all, or climbing to street level.

The tunnel will be double tracked throughout and as a matter of course will be electrically operated and well lighted. Through the rock sections both tracks will run in the same tunnel. In the earth approaches it may be more convenient to put two separate tubes side by side, but this is unlikely, as the rock is known to be near the surface throughout.

The scheme in its entirety is expected not only to give the C.N.R. the most up-to-date terminal station in any Canadian city, but to form quite a factor in the fuller and more complete development of Montreal.

We are indebted to H. K. Wicksteed, B.A.Sc., M. Can. Soc. C.E., Chief Engineer of Surveys for Mackenzie, Mann and Co., for the information contained in the above and for the accompanying plan and profile.



Profile of Canadian Northern Ry. Tunnel Entrance to Montreal.

DOMINION LEGISLATION.

A bill entitled "An act respecting the Canadian Northern Tunnel and Terminal Co., Ltd.," which has been introduced in the House of Commons, sets forth that the company is incorporated under The Companies Act and declares the undertaking to be a work for the general advantage of Canada. It authorizes the company to construct a tunnel for one or more railway tracks, from a point in Montreal, generally westerly under Mount Royal, with the necessary approaches, air shafts and other outlets, and of tubes and terminals and works incidental to its operation, also lines to connect the company's lines with those of the C.N. Ontario Ry., the C.N. Quebec Ry. and the Montreal Harbor Commissioners. Before constructing lines along any highway, or public place, the consent of the municipality interested must be given by bylaw. Securities not to exceed $20,000,000 may be issued. The construction of the tunnel, or railway, shall be commenced within two years after the passing of the act.

The Minister of Railways for British Columbia has approved of the increase of the directors of the Canadian North Eastern Ry. from five to seven.

The Department of Railways and Canals received tenders to Jan. 29 for the supply of 650,000 tons of bituminous coal for the Intercolonial Ry., and 13,000 tons for the Prince Edward Island Ry.

Great Northern Railway Lines in Canada

Fort William-Port Arthur, Ont.—It was reported in Port Arthur, Ont., Jan. 4, that an English syndicate had acquired 900 acres of land, partly within the municipality of McIntyre, and that this had been done in the Great Northern Ry interest. Countenance is given to the report by the presence in the city of the engineers attached to the G.N.R. staff, and the fact that they have been prospecting in the neighborhood for a considerable time past, making surveys for lines converging on this property. It is stated that a line will be built to the International boundary, and find an outlet at Duluth, Minn., and that another line will be built to Winnipeg to connect there with the Midland Ry. of Manitoba. Beyond these reports nothing is known of the project.

Midland Ry. of Manitoba—Midland Great Northern Ry.—The G.N.R. operates its trains from the International boundary over the Canadian Northern Ry. from Emerson, and then on to its own line from near Oak Point into the new freight terminals on Isabella St., Winnipeg. The work at the terminals was expected to be fully completed by Jan. 20.

Wenatchee to International Boundary.—It is reported that an agreement has been reached with the Washington State authorities as to the right of way for the projected line from near Wenatchee northerly to Oroville, a station on one of the sections of the Vancouver, Victoria and Eastern Ry. which bends into the state, and that construction will be started within six months.

Vancouver, Victoria and Eastern Ry. and Navigation Co.—Tenders are being asked for the dredging at the proposed new piers on the company's Burrard Inlet water front, Vancouver. It is estimated that 150,000 cubic yards of material will have to be excavated. (Jan., pg. 27.)

Grant, Smith and Co. and McDonnell, Limited, has been incorporated under the Dominion Companies Act, with a capital of $100,000 and office at Vancouver, B.C., to carry on a railway and general contracting business, and to take over as a going concern the business of Grant, Smith and Co. and McDonnell. The provisional directors are: Grant Smith, Angus McDonnell, J. Sims, Vancouver, B.C.; E. V. Hauser, W. E. Hauser, New York city.

Manitoba Public Service Commission.—Speaking at Winnipeg, Jan. 4, Premier Roblin stated that a measure will be laid before the Legislature at the forthcoming session to establish a public service commission for the province. It is intended to bring under the control of this commission steam and electric railways, gas and electric light companies, telegraphs, telephones, elevators, and any other public utility or public service that may be considered in the interests of the people of the province.

Traffic Orders by the Board of Railway Commissioners.

The dates given for orders are those on which the hearings took place and not those on which the orders were issued.

Rates on Macaroni, Spaghetti and Verrmicelli.

15635. Nov. 21, 1911.—Re application of the Transportation Bureau of Montreal Board of Trade, on behalf of Montreal Wholesale Grocers' Guild, under sec. 321 of the Railway Act, for an order reducing the classification of macaroni, spaghetti and vermicelli from 2nd to 4th class for less than carloads, and 4th to 5th class for carload shipments. It is ordered that a supplement to Canadian Classification 15 be issued, reducing the carload rating of macaroni, spaghetti, and vermicelli, from the 4th to the 5th class, to become effective not later than Jan. 15, 1912.

The Regina Rate Case.

15659. Dec. 19, 1911.—Re order 12520 dated Dec. 10, 1910, made upon application of city of Regina, Sask., directing Canadian Pacific and Canadian Northern Ry. Cos. to publish and file new freight tariffs, as provided in the order, to take effect not later than Apr. 1, 1911. A stay having been granted to permit the railway companies interested to appeal to the Supreme Court of Canada from the order, and the appeal having been dismissed by the Supreme Court, it is ordered that the effective date of the new freight tariffs required to be filed under the order be changed to Apr. 1, 1912.

Interswitching at Brandon.

15672. Dec. 22.—Re order 14606, Aug. 21, 1911, fixing, subject to provisions of order 14107, and general interswitching order 4988, July 8, 1908, the toll of the Brandon, Saskatchewan and Hudson's Bay Ry. for service of interswitching traffic transferred to it by the Canadian Pacific or the Canadian Northern Railways, for delivery to the C.N.R. or the C.P.R. respectively, at Brandon, Man.; and the application of the Brandon, Saskatchewan and Hudson's Bay Ry. to amend the order to provide for a charge covering certain empty movements where C.P.R. cars are being returned home by the C.N.R., and the C.N.R. cars are being returned home by the C.P.R. It is ordered that order 14606 be amended by adding after paragraph 4 the following paragraph:

4. (a) On empty cars transferred between the C.P.R. and the C.N.R., on which the Brandon, Saskatchewan and Hudson's Bay Ry. does not receive loaded revenue under the provisions of this order, the Brandon, Saskatchewan and Hudson's Bay Ry. toll shall not exceed $2 a car; the toll to be collected from and paid by the C.P.R., or the C.N.R., or both, as may be mutually arranged by the said companies.

White Pass and Yukon Route Rates.

15719. Jan. 2.—Re application of British Yukon Ry., British Columbia Yukon Ry., and Pacific and Arctic Ry. and Navigation Co., for a rehearing, pursuant to the order of the Governor in Council, dated June 16, 1911, and of the Board's order of Jan. 18, 1911; and re application on behalf of Dawson Board of Trade, under sec. 63 of the Railway Act, and the rules governing the procedure before the Board, for an order directing commissions to issue to take evidence in a foreign country, in connection with the said application. It is ordered as follows:—Commissions may issue directed to W. M. Tisdale, attorney at law, Redlands, Cal., and J. P. Hartman, attorney at law, Seattle, Wash., named by and on behalf of the complainant for the examination, viva voce, of witnesses on behalf of the said complainant at Redlands and Seattle aforesaid, before the said commissioners. The respondent companies shall, within three days after the service of this order upon their counsel, F. H. Chrysler, K.C., file with the Board the names of agents at Redlands and Seattle, who shall represent them and upon whom the commissioners herein appointed may serve notice of the time and place for the taking of evidence authorized under the commission. In the event of the failure of the respondent companies, through their counsel, to appoint such agents, or the failure of the agents to attend at the examination before the commissioners, upon notice, the said commissioners may proceed to execute their commissions as therein authorized. Upon the execution of the said commissions and the examination of the said witnesses and before Feb. 1, 1912, the said commissions and the depositions of the said witnesses and all proceedings taken upon the said commissions shall without delay, after the said commissions shall have been executed, be transmitted to the Secretary of the Board of Railway Commissioners for Canada, at Ottawa.

Rates on Hay.

15724. Nov. 21, 1911.—Re application of Montreal Board of Trade Transportation Bureau, on behalf of shippers of hay in Montreal, under sec. 323 of the Railway Act, for an order disallowing the increased rates on hay from Ontario and Quebec to eastern U.S. points, published by the Grand Trunk, Canadian Pacific, Canadian Northern Quebec, and Quebec, Montreal and Southern Railway Companies, to become effective Oct. 16, 1911, and reinstating the rates which were in effect before that date. It is ordered that the tariffs published and filed by the Grand Trunk, Canadian Pacific, Canadian Northern Ontario, Canadian Northern Quebec, Quebec, Montreal and Southern, Central Vermont, Ottawa and New York, Central Ontario, Thousand Island, and Lotbiniere and Megantic Railway Companies, and the New York Central and Hudson River and Rutland Railroad Companies, increasing the rates on hay and straw from Ontario and Quebec to eastern points, the effective date of which was (by order 15080, Oct. 12, 1911) postponed until Jan. 1, 1912, be disallowed.

A GENERAL PURCHASING AGENT'S VIEW.

Adolph Butze, who recently retired, after having been General Purchasing Agent of the Grand Trunk Railway for 16 years, writes:—

"I can assure you I will only be too glad to always have The Railway and Marine World to keep me posted as to what is going on in the way of railway news. I know of no paper to keep me better posted, and I assure you that I wish you every success and prosperity."

General Inquiry into Western Freight Rates.

15754. Jan. 2.—Re rates for freight traffic upon railways operating west of Port Arthur. Whereas many general complaints and petitions have been made to the Board against existing freight rates charged by railway companies operating west of Lake Superior, and the Board had been delaying the consideration thereof until the final determination of the Regina rate case; and whereas the Supreme Court of Canada has dismissed the appeal of the Canadian Pacific and Canadian Northern Ry. Cos. from order 12520, Dec. 10, 1910, re application of city of Regina, requiring the discrimination in favor of points in Manitoba, and against points in Saskatchewan and Alberta, to be removed by reducing the class freight rates from Port Arthur and Fort William, and points east thereof, to the said points in Saskatchewan and Alberta, and the said dismissal having left the Board free to undertake a wider investigation; and whereas the tolls of railway companies operating in British Columbia are already the subject of enquiry by the Board, upon the complaints of the Vancouver Board of Trade and the United Farmers of Alberta; and whereas the Board is empowered by the Act, upon its own motion, to hear and determine any matter or thing which, under the Act, it might enquire into, hear, and determine upon application or complaint; therefore it is declared to be advisable that a general enquiry be at once undertaken by the Board into all freight tolls in effect in Manitoba, Saskatchewan, and Alberta, and in Ontario, west of and including Port Arthur, with the view that, in the event of its being determined that the tolls, or any of them, are excessive, they shall be reduced as the Board may determine. The Board will sit at Ottawa on Feb. 13, to consider the procedure upon the enquiry and give directions with reference thereto.

Car Ferry and Standard Gauge Railway for Prince Edward Island.

The Prince Edward Island Ry. is 3½ ft. gauge, and is owned and operated by the Dominion Government. Connection with the mainland is maintained by Dominion Government icebreaking steamships during the winter, and by privately owned steamships, subsidized by the Government during the open season of navigation. It has always been claimed by the province that one of the terms upon which it entered Confederation was that adequate provision should be made by the Dominion for continuous connection with the mainland, and there has been a constant agitation going on for improved facilities. About 20 years ago a project was under consideration for the construction of a tunnel, and from 1896 onward the project was discussed in and out of parliament. The late government declared itself in favor of the building of a tunnel, but took no active steps toward carrying out the project. Some years ago an alternative project for the operation of a car ferry was put forward, but nothing was done to further it. This company proposed to transfer standard gauge cars to the Island for loading and unloading, thus saving at least one handling of the freight.

An Ottawa dispatch, Dec. 28, stated that an announcement had been made by the Premier that the Government had determined to undertake the establishment of a carferry service between the Island and the mainland, and that the proposal of the Government would involve the change of the narrow gauge on the island railway to standard. We have since received confirmation of this from the Prime Minister.

At a meeting held in Charlottetown, Jan. 5, a resolution was passed endorsing the project and the standardizing of the gauge of the railway on the Island. W. B. Mackenzie, Chief Engineer of Government railways, who spoke, said that a car ferry was feasible, but it would require to be more powerful than any now in existence. The points between which the ferry would operate were being considered. As to the suggested tunnel its cost would be enormous; the total length, including land tunnels, would be about 12 miles, and at the point where the tunnel would come under the water of the strait there would be 150 ft. of water between the top of the tunnel and the surface.

The main estimates laid before the House of Commons, Jan. 11, contain an appropriation of $400,000 to provide a car ferry, and make the necessary alterations incidental thereto, including change from narrow to standard gauge.

Canadian Pacific Railway Construction, Betterments, Etc.

Megantic, Que.—Press reports state that engineers are endeavoring to locate a new divisional point nearer the International boundary than Megantic, Que., and that Lowelltown will probably be selected. In a recent interview D. McNicoll is reported as having stated that the divisional headquarters had been moved from Farnham to Sherbrooke, Que., with advantage, and that the question of the removal of the terminals at Megantic to a more suitable centre was under consideration.

St. Martins Jct.-Ste. Therese Grade Revision.—The Board of Railway Commissioners has approved plans for the grade revision between St. Martins Jct. and Ste. Therese, Que., and the carrying of a double track across six highways between the two points.

Ontario Division, Block Signal.—We are officially advised that it is intended to instal a block signal system on the Ontario division between West Toronto and Bolton, Ont., on the Owen Sound-Sudbury line, and on the Toronto-Windsor line between Islington and Streetsville Jct., Ont. It is expected that the work will be started at an early date.

Campbellford, Lake Ontario and Western Ry.—The plans for this line, which will give an alternative route into Toronto, were filed Jan. 10. The new line starts at Glen Tay, on the present Montreal-Toronto line, to which point the second track has been completed from Montreal, and proceeding southwesterly crosses the Kingston and Pembroke Ry. at Parham, and continues southwesterly to Belleville, thence keeping along the shore line south of the Canadian Northern Ontario Ry.'s Toronto-Ottawa line, passes through Brighton, Colborne and Grafton, and joins up with the C., L.O. and W. Ry. location, which was previously approved by the Government. This shows a route along the shore line passing through or near Cobourg, Port Hope, Newtonville, Newcastle, Bowmanville, Oshawa, and thence keeping midway between the G.T.R. and the Canadian Northern Ontario Ry. to a junction with the present line near Leaside Jct.

Georgian Bay and Seaboard Ry.—This recently completed line from Port McNicoll, Georgian Bay, to Bethany Jct., on the Montreal-Toronto line, was passed for traffic by the Dominion Government's inspecting engineers at the end of 1911. The section from the Bay to Coldwater Jct., about 14 miles, has been operated for some time, and a through service is now being operated over the entire line of 88 miles. A description of the terminal facilities at Port McNicoll was given in our last issue.

South Ontario Pacific Ry.—There have been deposited with the Secretary of State at Ottawa a duplicate of a mortgage securing an issue of bonds for the building of this line from Guelph Jct. to Hamilton, Ont., 16.3 miles, and a duplicate of the lease of the same to the C.P.R. for 999 years from Jan. 1.

Collingwood Southern Ry. — Press reports state that C.P.R. engineers are making surveys out of Collingwood for a line to Baxter, on its Toronto-Sudbury branch, and from Collingwood to Utopia, also on the Toronto-Sudbury line.

Manitoba Division Construction. — The new lines under construction in the Manitoba Division include an extension of the branch from Lauder, now ending at Tilston westerly to the provincial boundary, 3.2 miles; an extension of the branch from Virden, now ending at Two Creeks, to McAuley, on the Kirkella-Lanigan line, 23 miles, and a line from Lauder, southeasterly direction to Boissevain, 36 miles.

Saskatchewan Division Construction.—The new track exclusive of second track and sidings laid on the Saskatchewan Division during 1911 totalled 257.4 miles, and was distributed as follows:—Ageura to Viceroy, on the extension westerly from Weyburn, 23.8 miles; Silton southerly to Valeport on the line south from Bulyea, 7 miles; Imperial southerly to Valeport on the Regina-Colonsay line, 59 miles; Moose Jaw Jct. southerly to Dunkirk, 26.8 miles; from near Anglia to Conquest, 53 miles, on the Moose Jaw-Lacombe-Kerrobert line; from Wilkie Jct. to Cutknife, 27.8; from Swift Current Jct. southeast to Neville, 27 miles; Swift Current northwest to Cabri, 27.8 miles. Steel was laid on 17.3 miles of second track, and there are 5.9 miles under construction between Pasqua and Caron. The extensions under construction are as follows:—Provincial boundary near Tilston westerly to Alida, 21 miles, on the extension from Lauder; an extension of 2.2 miles on the extension of the line westerly from Weyburn; Estevan to Neptune, on the Estevan-Forward line, 55 miles; from Dunkirk to Expanse, on the extension southwesterly, 8.2 miles; from Outlook to Conquest on the Moose Jaw-Lacombe line, 8.0 miles; from Kerrobert to near Tramping Lake, 25 miles; from Wilkie southeast to Kelfield, 35 miles; from Cutknife northerly on the branch from Wilkie, 4.2 miles; from Neville to Vanguard on the branch from Swift Current southeasterly, 18.0 miles, and an extension of two miles on the branch from Swift Current northwesterly.

Lauder Extensions.—The Board of Railway Commissioners has approved revised location plans of the branch from Lauder, Man., between mileage 32.28 and 54.63 in Sask. This line will link up with the Stoughton-Weyburn line at Griffin, Sask.

Weyburn to Lethbridge Branch.—The Board of Railway Commissioners has authorized the opening for traffic of the extension of this line from Ogema, mileage 52.2, to Viceroy, mileage 75.85, Sask.

Moose Jaw to Pasqua, Sask., Second Track.—The Board of Railway Commissioners has authorized the opening for traffic of the second track between Moose Jaw and Pasqua, Sask., mileage 127.68 to 134.43.

Swift Current to Brooks. — The Board of Railway Commissioners has approved of revised location plans of this branch to mileage 35.32, and has authorized the opening of the branch for traffic from mileage 0 to 33.

Wilkie-Anglia Branch.—The Board of Railway Commissioners has approved of location plans for this branch from mileage 24.90 to 40.66, and has authorized the crossing and diversion of 14 highways between the same mileages, in Saskatchewan.

Manitoba Lake Branch.—The Board of Railway Commissioners has authorized the opening for traffic of the Manitou Lake branch from Wilkie to Cutknife, Sask., mileage 0 to 29.8.

Alberta Division Construction. — The company laid 96.3 miles of new track, exclusive of second track and sidings, during 1911, on lines in Alberta, distributed as follows:—Lethbridge to Aldersyde, 56.8 miles; Castor to Coronation, on the extension of the Lacombe branch easterly; and Nightingale to Standard, 17.5 miles, on the line from Irricana easterly. The lines at present under construction are the extension of the Lacombe branch easterly from Coronation to Monitor, 38 miles, and from Bassano to Irricana, 36 miles.

Medicine Hat, Alta.—Press reports state that work was started Jan. 4 on the enlargement of the bridge across the river at Medicine Hat, Alta., so as to enable a second track to be laid over it.

Calgary Shops.—The bylaw confirming the agreement between the Calgary city council and the C.P.R. with respect to the establishment of shops there was carried by 535 votes to 21, Jan. 9. Under the agreement the company agrees to build car shops at a cost of not less than $2,000,000, and to maintain the same for 21 years, and to convey to the city not less than five nor more than 10 acres as a site for a sewerage disposal plant. The city will release the company from the necessity of maintaining the present car shops, and agrees to have the city boundaries extended so as to take in the lands on which the new shops are to be built, to open up certain highways, and do other works, the most important of which is the extension of the city electric railway to the shops. A second bylaw providing for the extension of the electric railway, the sewage system and the water system to the site of the shops was carried on the same day by 537 votes to 18. A full description of the new shops, with ground plan, is given on another page of this issue.

Strathcona-Edmonton Bridge.—F. W. Peters, Assistant to the Vice President, was in Strathcona, Alta., recently to discuss with the city council the question of the approaches to the high level bridge now under construction over the Saskatchewan River. The principal point in connection with the matter arises out of the high bank necessary. The city desires that the C.P.R. should assume responsibility for the maintenance of the roadway for a number of years in case the bank should slip.

British Columbia Division Construction.—The new track, exclusive of second track and sidings, laid on the British Columbia Division during 1911, totalled 35 miles, 10 miles being on the Waldo branch, and the remainder on the Kootenay Central Ry. between Colvalli and Fort Steele, B.C. The lines under construction at the end of the year were the Kootenay Central Ry. from Golden south to Spillawachen Landing, 42.0 miles, and Fort Steel to Skookumchuck Creek, 21 miles; a branch from Three Forks to McGuigan, 3.6 miles, and a spur line of 3.2 miles at Port Moody.

Rossland Branch.—We are officially advised that the company has under consideration plans for the electrification of its Rossland branch. Recent press reports state that the section of the line to be electrified will be from Castlegar to Rossland.

Port Moody to North Vancouver.—A route plan has been filed with the Department of Railways at Ottawa, for a line from Port Moody, along the north side of Burrard Inlet, to North Vancouver. The plan shows a line starting at mileage 115 on the main line, Cascade subdivision, and terminating at the shore line at D.L. 555. The North Vancouver council, Jan. 9, asked the Minister of Railways not to approve of the plans until the council could be heard on the matter. (Jan., pg. 28.)

The principal new work to be done on the Western lines this year, for which over $20,000,000 has been appropriated, is dealt with in a separate article on another page of this issue.

The C.P.R. has offered to supply a special train to the Ontario Department of Agriculture to demonstrate and illustrate various schemes for better farming. The train will consist of three baggage cars for material, some cars for lectures, a dining car and sleeping car, for the staff. It will be known as the Better Farming Special, and is expected to start on its itinerary through the province towards the end of February.

The C.P.R. Appropriates $20,000,000 for Western Lines.

George Bury, Vice President and General Manager, Western Lines, Canadian Pacific Ry., spent about a week in Montreal, in the middle of January, consulting with the President, Sir Thos. G. Shaughnessy as to the work to be done west of Lake Superior during the current year. As a result, over $20,000,000 has been appropriated for betterments and new construction, in addition to $2,500,000 previously appropriated for the Calgary shops, and to a large amount which will be spent in additions to the hotel system.

The following branch line construction will be undertaken:—

The branch from Weyburn, Sask., to Lethbridge, Alta., already built to Viceroy, Sask., about 75 miles from Weyburn, will be extended west for about 100 miles, and a start will probably be made on this line in Alberta, and at least 25 miles built there. This line, when completed between Viceroy and Lethbridge, will give a through route from Winnipeg via the Crows Nest Pass, to Nelson, etc., entirely independent of the main transcontinental line.

The branch from Swift Current northwesterly, on which track has been laid for 33 miles to Cabri, will be extended for about 85 miles. It is the intention to connect this branch with the main transcontinental line again at Bassano, or in that vicinity, which will give an alternative route with the present main line via Medicine Hat. The new line will be only three or four miles shorter than the main line route, but it is being built to a 0.4 gradient, and will therefore be better adapted for freight traffic.

A branch from the main transcontinental line, some 50 miles west of Medicine Hat, will be built for between 30 and 40 miles southwesterly into the southwest Alberta irrigated land section.

The second tracking of the main transcontinental line will be gone on with at the most congested points. Already there is a second track between Port Arthur, Ont., and Brandon, Man., 555.8 miles, and between Pasqua and Caron, Sask., 23 miles. This year second track will be laid between Regina and Pasqua, 34.9 miles, and between Caron and Chaplin, Sask., 37.8 miles, which, with the second track already built between Pasqua and Caron, will give a continuous second track from Regina to Chaplin, 95.7 miles. From Regina east to Brandon and Winnipeg, in addition to the main transcontinental line, there is the alternative route via Stoughton, Reston and Souris.

A second track will be built for about 5½ miles from Maharg, the site of the new shops, 4.5 miles east of Calgary station, to about one mile west of Calgary station. This will provide for the heavy traffic near Calgary, especially between that place and the new shops site.

A second track will also be built between Hammond, B.C., and Vancouver, 24.1 miles.

One of the most important of the year's works will be the relaying of nearly 500 miles, with 85 lb. steel rails, to replace the present lighter weights. Of this mileage over 300 miles will be laid on the line between Portage la Prairie, Man., and Edmonton, Alta., via Saskatoon, and the balance on various other sections.

A press report from Winnipeg to the effect that the company was preparing to change its main line route by abandoning the Kicking Horse pass in favor of the Crows Nest pass, is not believed to have any foundation, and there appears to be little doubt that the whole of the present main transcontinental line from Port Arthur to Vancouver will be gradually completed as a double track route. The line between Macleod, Alta., and Crows Nest is, however, to be considerably improved, by reducing the present 1% gradient to 0.6 west bound and 0.4 eastbound.

At Fort William, coal docks and a coal handling plant, an illustrated description of which appears on another page, will be built on Island no. 1, at a cost of over $1,000,000. A freight shed with 25,000 tons capacity will also be built there, as well as a dock to handle steel rails and an addition of 500,000 bush. to the elevator capacity.

The great increase of traffic and the consequent congestion of the very large yards at Winnipeg has rendered it imperative to establish larger yards, where much more room can be obtained. Two schemes are under consideration, but it appears probable that a cut-off will be built on the main transcontinental line, from East Selkirk, on the Red River, 20.8 miles below Winnipeg, to Reaburn, 35.3 miles west of Winnipeg, necessitating a bridge over the Red River. Should this scheme be finally decided on the yards will probably be established at or near Reaburn, so that through freight trains would not pass through Winnipeg. Similar congestion at Vancouver will be got over by establishing a large yard at Coquitlam, B.C.

At Brandon, Broadview, Man., Regina and Outlook, Sask., the yard capacity will be doubled. At Moose Jaw and Swift Current, Sask., the yard capacity will be increased a third. At Alyth, Alta., 2.3 miles east of Calgary, there will be an addition of a fourth to the capacity of the new yards. Extensive improvements and extensions will be made to the freight sheds, team tracks, etc., at Saskatoon, Sask.

Extensive improvements are planned for Vancouver, including additions to freight sheds, yards, etc., involving large expenditures, but the plans, including those for a new passenger station, are not yet completed.

A handsome station will be built at Edmonton, Alta., and about 75 stations at other points.

Block signalling is to be installed between Fort William and Winnipeg, and also in the Calgary district.

Air Brake Equipment for all Trains.

The Board of Railway Commissioners will consider at Ottawa, on Feb. 6, the amending of order 8145, Sept. 14, 1909, as follows:—

"Every such railway company shall not run any train which is not equipped with air brake connection between the conductor's van, or van on rear end of train, and the locomotive engineer. Where cars are handled in trains which are not equipped with air brakes but fitted with straight air pipe, no two such cars shall be placed together in any part of the train. Every such railway company shall be liable to a penalty of not exceeding $25 for every failure to comply with the foregoing regulations within the time for their coming into force and thereafter."

Hon. F. M. Young, of Manitoba, has been elected Chairman of the Senate Committee on Railways, Telegraphs and Harbors.

C. Morrow, formerly agent, Quebec Central Ry. at Thetford Mines, who was recently charged with misappropriation of funds, and discharged on account of irregularities in the preliminary hearing, was again before the King's Bench at Quebec, Jan. 11, on the same charge. The matter was adjourned for a month for consideration of a motion to dismiss the case.

Canadian Northern Ry. Coal Dock at Port Arthur.

The Canadian Northern Coal and Ore Dock Co., Ltd., a subsidiary of the Canadian Northern Ry. has under construction an extension of its coal dock at Port Arthur, Ont. Some work was done during 1911, and the new work when completed will double its capacity. The cost of the original dock was about $1,000,000, and the addition will cost about $500,000. There will be three unloading towers, and a most complete coal handling plant and storage sheds, the machinery being operated by a steam plant of 1,000 h.p. The plant will be capable of unloading a 10,000-ton steamer in 18 hours, and can at the same time load direct from the vessel 225 cars of coal in 10 hours, or pick up from the pile 175 cars of coal in the same time. During the last season the plant handled 957,000 tons of coal of all kinds.

The dock when completed will have a frontage of 616 ft. to the harbor, and the unloading tracks, with the three towers, will extend along this for about 450 ft. The area devoted to the plant extends for a depth of 2.525 ft. from the harbor front. Running through the centre are railway tracks on which the coal is loaded from the various coal pockets which are fed by the conveyors running from the unloading plant. Beyond these coal pockets are three storage sheds, no. 1 having an area of 288 by 244 ft., and the other two being 276 by 205 ft. each. These are also served by the conveyor system, and have their separate coal pockets for loading the coal into cars brought in on the spur railway tracks. At the inshore line there is located the office, and just outside on the spur line are the track scales. Shed no. 3, with its coal pockets and tracks, is outside, but adjoining the area already mentioned, so that at the inshore line the plant covers an area of about 1,000 by 300 ft.

The actual work of the extension will consist of improvements to the south side of the dock, adding bituminous coal storage to the present dock of 250 ft. wide by approximately 2,000 ft. long, removing the old anthracite coal shed and building a 60,000 anthracite shed, adding 144 ft. additional loading pockets for the bituminous coal, also adding a double pick up storage bridge on the south side, together with rearranging the trackage and scales. The dock end improvements will consist of putting in a revetment wall along the south side and across the outer edge of the dock some 2,600 ft. of heavy tongue and groove sheet piling. The Barnett-McQueen Co. has a contract to put in the foundation for the dock; the company owning the dock will do the filling work itself, either by ballast trains or by hydraulic dredging, and the equipment will be supplied by the firms manufacturing it.

St. John's Ambulance Association on the Government Railways.—A centre of the St. John's Ambulance Association has been formed for the Dominion Government Railways, the patrons being the Minister and Deputy Minister of Railways; the President and Vice Presidents, being the members of Government Railways Managing Board, with W. C. Paver, Secretary, Insurance and Provident Society, as Secretary, and the following as an executive committee: G. R. Joughins, Superintendent Motive Power; T. C. Burpee, Engineer of Maintenance; J. T. Hallisey, Superintendent, Truro, N.S.; Y. C. Campbell, Superintendent, New Glasgow, N.S.; E. Price, Superintendent, Campbellton, N.B.; and G. A. Sharp, Superintendent, P.E.I. Ry., Charlottetown.

S. P. Porter, Deputy Minister of Railways and Telephones for Saskatchewan, has resigned.

Canadian Northern Railway Construction, Betterments, Etc.

Canadian Northern Quebec Ry.—We are officially advised that the projected line from St. Jerome to St. Eustache, Que., is an old project for which a trial line was run some years ago, but which it was not deemed advisable to build until the Montreal approaches were completed. The building of this piece of line will give a more direct connection between Montreal and the old Great Northern Ry. than at present exists. It is also expected that a cut off between St. Stanislas and St. Justin will be located during the winter. By this it is hoped to cut out some six or eight miles of the distance between Montreal and Quebec, and to eliminate heavy curves on the original Great Northern Ry. and the Laurentide Ry., bringing the entire line to a 0.4 and 0.5 standard gradient, as between Quebec and Port Arthur. Another object of the work is to place Shawinigan Falls on the main line for passenger traffic, instead of on a branch. A trial line was run for this piece of work during 1910-11 by A. W. Whitney, and the present surveys are being made by Jno. Congdon, under the direction of H. K. Wicksteed, M. Can. Soc. C.E., Chief Engineer of Surveys.

The development of the company's plans in the vicinity of Montreal are dealt with separately on another page.

Canadian Northern Ontario Ry.—The Board of Railway Commissioners has authorized the company to use for construction purposes only, pending the completion of an interlocking plant, a crossing of the C.P.R. at Chaudiere Jct., Ottawa.

Press reports from Ottawa states that G. H. Shaw, General Traffic Manager, is negotiating with business interests in the city regarding the building of a spur line to serve the industrial concerns west of the C.P.R. tracks near Carling Ave.

The Board of Railway Commissioners has approved of revised location plans for the line through Loughborough tp., authorized the building of a branch line from Oshawa station to Oshawa town, to connect there with the projected Toronto Eastern Ry., 3.95 miles, and also authorized the building of a spur line by the G.T.R. for joint use with the C.N.O. Ry. on the Don Esplanade, Toronto.

The plans for the entrance of the company's line from Toronto into Hamilton, were expected to be filed Jan. 20. It is reported that the entire right of way has been acquired, and that over 300 houses and other buildings will have to be taken down or moved. Local reports state that the plans will give rise to considerable discussion before they are approved by the city council.

The construction of the Ottawa-Pembroke section of the line to Port Arthur, the contract for which has been let to J. P. Mullarkey, covers the building of two large bridges. That above Chats Fall, on the Ottawa River, will consist of 20 spans, while that at Portage du Fort will be somewhat smaller. The Board of Railway Commissioners has approved of the revised location of the line between mileage 162 to 176 in this section.

The Board of Railway Commissioners has also approved of revised location plans for the line between mileage 325.23 and 343.55 from Montreal, which carries the line to a point between the C.P.R. and the G.T.R. lines at Nipissing Jct., and for the location of the line between mileage 346.37 and 366 from Montreal, and between Capreol Jct., mileage 0 and 71.81. These mileages come within the contract between Ouwatin and Pembroke, which Angus Sinclair has. Ouwatin is at mileage 276 on the line from Toronto northerly via Gowganda Jct., and the work is to be pushed easterly from there with a view of getting the line into North Bay by the end of the present year, and having it completed through to Pembroke, to connect up with the J. P. Mullarkey contract by the end of 1913. Sub-contracts are reported to have been let for the first hundred miles of the work, and work is reported to have been started at North Bay, both easterly and westerly.

The Board of Railway Commissioners has approved of revised location plans through unsurveyed territory in Algoma between mileage 148 and 166; between 209 and 225.42; between 287 and 327. and between 497.16 and 498, all from Sudbury Jct.

Canadian Northern Ry.—Press reports state that some negotiations are in progress which will result in the building of lines which will provide a connection between the terminus of the C.N.R. branch line at Gunflint Narrows on the International boundary, and Duluth, thus giving a shorter and more direct connection between Port Arthur and Duluth than is now afforded.

The completed report of the construction department for 1911, shows that 446.10 miles of track was laid on lines in Manitoba, Saskatchewan and Alberta, and that 369.09 miles of grading was completed within the same provinces. A considerable mileage of grading was carried over from 1910, and of the grading done in 1911, track will not be laid on considerable mileage until the summer. Grading was done on 11.5 miles of what is known as the Winnipeg and Northern Ry. branch, and on the Shellmouth branch track was laid from Hampton, Man., northerly for 12.96 miles, and 12.2 miles of grading have been completed. Work was done on the following lines in Saskatchewan:—Track laid from Grosse Isle northerly for 26.37 miles on the Grosse Isle branch; on the Maryfield branch 0.31 mile of track was graded and 27.3 miles of track laid from Ceylon, westerly; on the Swift Current branch 31 miles of grading were completed; grading was completed on the Jackfish branch on 19 miles, and track was laid from Walta northerly for 17.41 miles; grading was done on 9.12 miles of the branch from Denholm easterly; track was laid from Shellbrook westerly for 37 miles on the Prince Albert-Battleford branch; on the Thunderhill branch track was laid from Pelly westerly for 34.26 miles; from Delisle southerly 46 miles of track were laid on the Delisle extension, and 1.37 miles of grading done, while on the Moose Jaw branch track was laid from Radville northerly for 82 miles, and 25.16 miles of grading was done. In Alberta, grading was done for 0.28 of a mile on the Vegreville-Calgary branch, and track was laid southerly from Red Deer River for 22.3 miles; grading for 41 miles was completed on the Strathcona-Camerose branch line; on the Brazeau branch track was laid for 65 miles from Stewartwyn westerly, and 62.93 miles of track laid; on the main line, called the Canadian Northern Alberta Ry., 104.85 miles of grading was completed, and 20 miles of track laid from St. Albert westerly; on the Morinville branch, track was laid for 55.5 miles from Morinville northerly, and 32.67 miles of track laid; while on the Peace River branch, 17 miles of grading was completed.

Duluth, Winnipeg and Pacific Ry.—We are advised that during 1911 track was laid on 50 miles between West Duluth and Paleface River, Minn.; and that an extension of two miles from West Duluth to the water front at Duluth is under construction. The contractors are Foley, Welch and Stewart, St. Paul, Minn. The completion of this line will give the Canadian Northern Ry. a direct line into Duluth from Winnipeg and Port Arthur via Fort Frances, Ont.

Canadian Northern Pacific Ry.—It was reported in Vancouver Dec. 31, that there were 5,400 men at work on the section of the line under construction between Port Mann and Kamloops, B.C. Representatives of Twohy Bros., who have a sub-contract on the line from Kamloops easterly, have arranged for wharfage accommodation at Kamloops, B.C., for getting in supplies for their work on the line near Louis Creek. In order to get in a steam shovel on the work they had to move it a couple of miles from near Ashcroft, and build a bridge across the North Thompson to get it on the job. At the Tete Jaune Cache end of the line the contractors have got in large quantities of supplies and materials for the building of two steamboats for use on the river. Certificates have been issued by the Minister of Railways for British Columbia, approving of plans for level crossing and diversion of wagon road at Spences Bridge, and for the diversion of wagon road at Ashcroft Bridge; and for a connection with the New Westminster Southern Ry. near Port Kells, 8.6 miles from New Westminster bridge.

Vancouver Island.—The Minister of Railways for British Columbia has approved plans for overhead bridges at Burnside Road, mileage 5.2, from Victoria; Atkins road, mileage 6.0 from Victoria, and for a number of level crossings between mileage 5.2 and 23.6 from Victoria. Work has been started by Moore and Pethick on the 40 mile section of the line extending beyond the summit at the west end of the Esquimalt and Nanaimo Ry.'s Cowichan Lake line.

Canadian North Eastern Ry. — The Minister of Railways for British Columbia has authorized the operation of the railway from the wharf at Stewart to Glacier Creek station, five miles. While the certificate is dated July 21, 1911, it was not made public until Dec. 21.

Eastern Canadian Passenger Association.

At the annual meeting in Montreal, Jan. 4. officers and standing committees for the current year were elected as follows:

Chairman, A. J. Parr, G.F. & P.A., Temiskaming and Northern Ontario Ry.

Executive Committee, W. Stitt, G.P.A., Eastern Lines, C.P.R.; T. Henry, T.M., Richelieu and Ontario Navigation Co.; H. G. Elliott, G.P.A., Grand Trunk Ry.

Rules Committee, W. Stitt, H. G. Elliott, G. Tombs, G.F. & P.A., Eastern Lines, Canadian Northern Ry., J. W. Hanley, G.P.A., Central Vermont Ry., C. Hartigan, G.P.A., Rutland Rd., F. F. Backus, G.F. & P.A., Toronto, Hamilton and Buffalo Ry., W. H. Underwood, A.G.P.A., Michigan Central Rd., J. M. Lyons, G.P.A., Intercolonial Ry., R. L. Fairbairn, A.G.P.A., Eastern Lines, Canadian Northern Ry.

Secretary, G. H. Webster.

Immigrant Traffic for Western Canada.—The Trans-Atlantic lines for many years past have been carrying immigrants through United States ports to Western Canada exclusively via Port Arthur, for example, from New York over the New York Central Rd. to Montreal or Prescott, thence by C.P.R. via Port Arthur to Winnipeg, thence to destinations beyond Winnipeg. The Grand Trunk Ry., in view of a new immigrant tariff about to be issued, desired to secure a portion of this traffic by the Lehigh Valley Rd. from New York to Niagara Falls, thence by G.T.R. to Chicago and connecting lines to Winnipeg, thence beyond by G.T. Pacific Ry. on exactly the same basis of fares as apply via Port Arthur. After considerable negotiations this new representation via Chicago to G.T.P.R. stations has been conceded.

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Established 1898.

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ADVERTISING RATES furnished on application.

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TORONTO, CANADA, FEBRUARY, 1912.

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Index to The Railway and Marine World for 1911.

At the commencement of this issue will be found a very complete index to The Railway and Marine World for 1911, which can easily be detached for binding with the issues of that year.

The index, which is divided into four sections, Steam Railway and General Matter, Electric Railway Department, Marine Department, and Personal, covers eight pages of closely printed matter, and will prove invaluable for reference purposes.

An examination of it will show the great range of matter published and subjects dealt with, and how thoroughly the whole transportation field throughout Canada is covered.

All departments of steam and electric and marine transportation interests are dealt with, our paper combining technical articles for the mechanical and engineering departments, practical matter for the maintenance of way, operating and traffic and other departments, and a great volume of news of interest and value to anyone engaged in any branch of transportation business.

Accuracy is our chief aim; no effort is spared to secure it, and, as a result, we know that our matter is relied on and appreciated. As a result our subscription list shows a most satisfactory increase during the whole of the past year. The increased volume of advertising speaks for itself.

Transportation Conventions in 1912.

Mar. 12-15.—American Boiler Manufacturers' Association, New Orleans, La.

Mar. 17.—American Association of Railroad Superintendents, Chicago, Ill.

Mar. 19-21.—American Railway Engineering Association, Chicago, Ill.

Mar. 28.—Eastern Association of Car Service Officers, Boston, Mass.

May 12.—Railway Industrial Association, Kansas City, Mo.

May 14-17.—Master Boiler Makers' Association, Pittsburgh, Pa.

May 15.—Freight Claim Association, Buffalo, N.Y.

May 15.—American Association of General Baggage Agents, New York City.

May 15.—American Railway Association. New York City.

May 20-22.—Railway Storekeepers' Association, Buffalo, N.Y.

May 22.—Association of Railway Claim Agents, Los Angeles, Cal.

May 22-25. — International Railway Fuel Association, Chicago, Ill.

June 12-14.—Master Car Builders' Association, Atlantic City, N.J.

June 16-18.—Wood Preservers' Association, Chicago, Ill.

June 17-19.—American Railway Master Mechanics' Association, Atlantic City, N.J.

June 18.—Train Dispatchers' Association of America, Louisville, Ky.

June 18-21.—American Association of Freight Agents, Chicago, Ill.

June 24.—Association of Railway Telegraph Superintendents, New York City.

June 26.—Association of American Railway Accounting Officers, Quebec, Que.

Aug.—Travelling Engineers Association.

Sept. 10-13.—Master Car and Locomotive Painters' Association of United States and Canada.

Sept. 10-12.—Roadmasters' and Maintenance of Way Association, Buffalo, N.Y.

Oct. 15-17.—American Railway Bridge and Building Association, Baltimore, Md.

Oct. 17-19.—American Association of Dining Car Superintendents, Denver, Col.

Nov. 6-10.—Association of Railway Electrical Engineers, Chicago, Ill.

Nov. 15.—American Railway Association, Chicago, Ill.

Dec. 12-13.—Association of Transportation and Car Accounting Officers, Louisville, Ky.

Passenger Rate Meetings at Detroit.

The annual meetings of the Niagara Frontier Summer Rate Committee, the Great Lakes and St. Lawrence River Rate Committee and the International Water Lines, Passenger Association were held at Detroit, Mich., in January. The rate clerks, as usual, met on Jan. 17 and 18 and revised the rates to be submitted to the general meetings.

The International Water Lines Passenger Association met Jan. 18, when the retiring president, T. Henry, Traffic Manager, Richelieu and Ontario Navigation Co., was presented with a gavel, the presentation being made by B. W. Folger, General Manager, Niagara Navigation Co., on behalf of the donors. A. A. Heard, General Passenger Agent, Champlain Transportation Co., Albany, N.Y., was elected President, and M. R. Nelson, Northern Steamship Co., New York, was re-elected Secretary.

The Niagara Frontier Summer Rate Committee met Jan. 19, when the retiring chairman, D. N. Bell, A.G. P.A. Pennsylvania Rd., was presented with a gavel. L. W. Landman, G.P.A. Michigan Central Rd., Chicago, was elected chairman. Jas. Morrison, chief rate clerk, C.P.R., Montreal, was re-elected Secretary, the position being made permanent. The fares as compiled by the rate representatives were approved. Application for membership from the Merchants Montreal Line and from the Niagara, St. Catharines and Toronto Ry. and Navigation Co. were refused.

The Great Lakes and St. Lawrence River Rate Committee also met Jan. 19, W. F. Wasley, Manager, Muskoka Lakes Navigation and Hotel Co., being elected Chairman. The representatives of the various steamboat lines announced their fares for 1912, which the Secretary was instructed to embody in the proceedings. The Port Huron and Duluth Steamship Co. and the Chicago and Duluth Transportation Co. were admitted to membership.

During the afternoon of Jan. 19 a large number of those attending the meetings were the guests of the Michigan Central Rd. on a special train, and visited the Detroit-Windsor tunnel and the terminals on both sides of the river.

The meetings in Jan., 1913, will be held at Ottawa, Ont.

C.P.R. Officials Dinner.—About 150 C.P.R. officials attended the "first family gathering" at the Place Viger Hotel, Montreal, Dec. 30, under the chairmanship of G. H. Ham, of the headquarters staff. The President's health was responded to by his son, A. T. Shaughnessy, who has since left the company's service to go into a financial business. Other speakers were C. E. E. Ussher, V. G. R. Vickers, H. H. Vaughan, F. P. Gutelius, Capt. Walsh, M. McD. Duff, F. R. Perry, Boston; J. A. Cantlie, J. J. Corbett, W. Stitt, H. E. Suckling, J. Kent and W. J. Camp. M. J. Power, the President's Secretary, gave a very amusing stump speech. There was a capital musical programme, and also moving pictures, showing a trip over the system from Liverpool to Hong Kong.

The Minister of Railways for British Columbia has authorized N. McL. Curran to issue tariffs of tolls for the Canadian North Eastern Ry., and has approved passenger and freight tariffs prepared, for use on the line between Stewart and Glacier Creek, B.C.

Mainly About Transportation People.

G. R. R. Cockburn, of Toronto, father in law of Sir Thomas Tait, died in London, Eng., Jan. 18.

T. Ahearn, President, Ottawa Electric Ry., returned to Ottawa Jan. 1 from a trip to Switzerland.

D. B. Hanna, Third Vice President, Canadian Northern Ry., returned to Toronto from Great Britain, Jan. 20.

Thos. McClelland, assistant car foreman, C.P.R., Montreal, was fatally injured in the Outremont yards, Jan. 14.

W. Wainwright, Vice President, G.T.R., is one of the directors of the newly incorporated Upper Fraser River Lumber Co.

G. C. Fletcher, for a number of years union ticket agent at the Windsor Hotel, Montreal, has retired to enter private employ.

The engagement is announced of Miss M. Angus, daughter of R. B. Angus, director, C.P.R., to Dr. C. F. Martin, Montreal.

Hon. A. L. Sifton has been appointed Minister, and W. J. Harmer Deputy Minister of Railways and Telephones for Alberta.

S. Buchanan, Superintendent, C.P.R. Upper Lakes Service, Owen Sound, Ont., was married recently to Miss M. Wilson, Detroit, Mich.

The engagement of D. E. Galloway, Assistant to the President, G.T.R. and G.T.P.R., and Miss L. B. Eaton, Toronto, is announced.

W. Wainwright, Vice President, G.T.R., and Second Vice President, G.T.P.R., has been elected Vice President, Guarantee Co. of North America.

T. F. English, who has resigned the position of Local Freight Agent, Calgary, Alta., has been appointed collector of customs there.

C. Arlien, foreman, Michigan Central Rd. boiler shop, St. Thomas, Ont., was presented with a mahogany pedestal by the employes recently.

Miss M. Welch daughter of P. Welch, of Foley, Welch and Stewart, railway contractors, was married to M. Miller, in Spokane, Wash., Jan. 5.

Sir Wm. Whyte has been elected Hon. President of a league which has been inaugurated in Winnipeg to promote Immigration to the province.

H. W. Brodie, General Passenger Agent, C.P.R., Vancouver, B.C., and Mrs. Brodie, sailed from that city during Christmas week for Honolulu.

J. W. Higgins, Assistant General Manager, Missouri Pacific Ry., has been promoted to General Manager, succeeding A. W. Sullivan, resigned.

C. C. Van Arsdol, Division Engineer, G.T. Pacific Ry. construction, Hazleton, B.C., returned there after spending Christmas with friends in Idaho.

Hon. J. Sharples, who has been associated with the directorate of railways centering in Quebec city, has resigned the presidency of the Union Bank.

C. Stiff, at one time an official of the old Great Western Ry., has resigned the secretaryship of the Hamilton, Ont., Board of Trade, owing to ill health.

Sir William and Lady Mackenzie returned to Toronto, Jan. 17, via New York, after spending Christmas and New Year in Europe, principally in Paris.

J. Piper, Roadmaster, G.T.R., Brantford, Ont., was the recipient of an address and New Year's gift from the men under him on sections 20, 21 and 22.

H. G. McMicken, European Traffic Agent, Great Northern Ry., London, Eng., and Mrs. McMicken, arrived in Winnipeg, recently for a short holiday.

L. Meagher, who had been engaged in construction on the Canadian Northern Ry. in Saskatchewan, died at Toronto, Jan. 13. He was a nephew of Lady Mackenzie.

Sir Wm. Mackenzie, President, and Sir Donald Mann, Vice President, Canadian Northern Ry., have been appointed Knights of Grace of the Order of St. John of Jerusalem.

Miss A. Kennedy, daughter of J. H. Kennedy, Chief Engineer, Vancouver, Victoria and Eastern Ry., was married in Vancouver, B.C., Jan. 11, to H. P. Cowan, of Montreal.

H. G. McMicken, European Traffic Agent, Great Northern Ry., U.S., remembered many of his old friends in Canada with some interesting verses and a useful souvenir.

Sir James C. Inglis, past-President of the Institution of Civil Engineers and General Manager and Consulting Engineer of the Great Western Ry. of England, died recently.

F. C. Salter, European Traffic Manager, G.T.R., London, Eng., and P. A. Clews, acting General Agent, G.T.R.,

A. Shields,
General Master Mechanic, Canadian Northern Railway.

Antwerp, Belgium, arrived in Canada, Jan. 4, on a business trip.

Sir Donald Mann, who has been staying in San Francisco and vicinity for some time, left there Jan. 21 for Vancouver, B.C. He is expected to return to Toronto early in February.

Major Leonard, M. Can. Soc. C.E., Chairman, National Transcontinental Ry. Commission, has given a second donation of $500 towards the erection of a Y.M.C.A. building in Cobalt, Ont.

J. J. Houghton, who has resigned the position of Chief Inspector, C.P.R. Time Service, was entertained at dinner by the department staff at Montreal recently, and presented with a purse of gold.

J. R. Nutter, chief clerk to the Superintendent of the Eastern Division, G.T.R., Montreal, was presented with an address and a purse of gold recently by the staff on retiring after 28 years service.

J. T. Wallace, Superintendent of the West Jersey and Sea Shore Rd., at Camden, N.J., has been appointed General Superintendent of Motive Power of the Pennsylvania Rd., succeeding the late R. N. Durborrow.

J. W. Stewart, of Foley, Welch and Stewart, railway contractors, was reported Dec. 25 to be recovering from a severe illness, and it was said he expected to leave Spokane, Wash., for a European trip as soon as possible.

C. W. Spencer, formerly Manager, Mackenzie, Mann and Co.'s eastern lines, and for many years in the C.P.R. service, who died in Montreal recently, left an estate valued at $127,066 to two sons and a daughter in equal shares.

J. T. Harahan, Sr., ex-president of the Illinois Central Rd., F. O. Melcher, second Vice President, Rock Island Rd., and E. B. Pierce, General Solicitor, Rock Island Rd., were killed in a collision of two Illinois Central trains at Kinmundy, Ill., Jan. 22.

D. J. Scott was given a purse of gold by Canadian Northern Ry. officials, Winnipeg, recently, on his promotion from chief landing master at the C.N.R. Customs to that of the assistant surveyorship for Winnipeg. A diamond brooch was given Mrs. Scott.

G. C. Wells, Assistant to Passenger Traffic Manager, C.P.R., has been appointed as the Eastern Canadian Passenger Association's representative on the standing digest executive committee of the American Association of General Passenger and Ticket Agents.

J. S. Pyeatt, who has been appointed Vice President and General Superintendent, Fort Worth and Rio Grande Ry., and St. Louis, San Francisco and Texas Ry., was, up to the early part of 1911, Superintendent, Canadian Division, Pere Marquette Rd., St. Thomas, Ont.

B. W. Folger, General Manager, Niagara Navigation Co., M. H. Brown, Division Freight Agent, C.P.R., and L. Macdonald, Division Freight Agent, G.T.R., have been elected representatives of the Transportation Lines on the Toronto Board of Trade's general committee.

L. McCrea, Seamen, Sask., who was engaged as section foreman under Sifton, Ward and Co., on the construction of the C.P.R. across the Julius muskeg, east of Winnipeg, in 1877, paid a visit to Winnipeg during the Christmas holidays, after an absence of many years.

John Leadley, who died in Toronto, Jan. 13, aged 87, was father of E. Leadley, of the G.T.R. Freight Claims Department, W. T. Leadley, of the G.T.R. freight department, Toronto, and of A. Leadley, Freight and Passenger Agent, Delaware, Lackawanna and Western Rd., Toronto.

Sir William Mackenzie left Toronto for Ottawa, Jan. 17, soon after his arrival from Europe, and on the following day left Ottawa for the west, accompanied by M. H. McLeod, General Manager, and T. G. Holt, Executive Agent, Canadian Northern Ry., for British Columbia.

H. Souette, railway contractor, Bridgewater, N.S., fell dead in the street there, Jan. 8. He had contracts for building sections of various lines in Quebec, New Brunswick and Nova Scotia during the last 35 years, the last one being a portion of the National Transcontinental Ry. near Edmundston, N.B.

B. E. Bush, President of the Missouri Pacific Ry., has been elected President of the Denver and Rio Grande Rd. also, succeeding E. T. Jeffery, who has been President since 1895. Mr. Jeffery has been made Chairman of the Board of Directors, succeeding George J. Gould, and will have charge of finances.

Hugh Sutherland, Executive Agent, Canadian Northern Ry., Winnipeg, and Mrs. Sutherland sailed from New York Jan. 20 on the s.s. Franconia for Alexandria, Egypt. They will go up the Nile and afterwards visit Italy and other places in Europe, expecting to return to Winnipeg about the end of April.

C. R. Scoles, General Manager, Atlantic, Quebec and Western Ry., New Carlisle, Que., recently gave evidence for the defence in the case against A. W. Carpenter for fraud in connection with the failure of the Charing Cross Bank, London, Eng., which was responsible for the financing of the railway construction.

W. R. Taylor, of Askwith, Taylor and Co., railway contractors, Ottawa, who died in Aylmer, Que., Jan. 14, entered the G.T.R. service in 1885. Two years later he removed to the U.S., going into the Missouri Pacific Ry. service, and returned to Canada in 1895 to become Manager of the Hull Electric Co., which position he resigned in 1909.

D. Bowker, who is said to be the oldest locomotive engineer in the C.P.R. service, retired from the service Jan. 1. He entered the service of the old South Eastern Ry. during its construction in 1869, and continued with the C.P.R. when it took over the line. During his 40 years service hauling passenger trains he never had an accident.

A. Butze, who has retired from the position of General Purchasing Agent, G.T.R., Montreal, under the provisions of the pension fund, was born at Quincy, Ill., in 1845. Prior to entering G.T.R. service in 1895, he served with the Wabash Rd., Missouri Pacific Ry., and the Monon Route. He was a participant in the American civil war.

W. G. Chace, A.M. Can. Soc. C.E., of Smith, Kerry and Chace, Toronto, has removed his headquarters from Winnipeg, where for the past five years the firm has had charge of the construction of the municipal hydro electric plant, to Portland, Ore., where he will have charge of the completion of the Mount Hood Railway and Power Co.'s works.

Henry Osborn, who died in London, Eng., Jan. 4, aged 82, was well known in New Brunswick, having been, from 1860, Manager, New Brunswick and Canadian Ry., St. Stephen. This railway was afterwards known as the New Brunswick Ry., of which he was a director, and for some time, President. He returned to live in England about 1888.

T. Rumney, General Mechanical Superintendent, Erie Rd., has resigned and will become General Superintendent of Motive Power of the Chicago Rock Island and Pacific Ry., at Chicago, Ill., succeeding W. A. Nettleton, resigned. Mr. Rumney is succeeded as General Mechanical Superintendent of the Erie Rd. by W. Schlafge, Mechanical Superintendent at Jersey City, N.J.

Matthew Neilson, M. Can. Soc. C.E., died in Montreal, Jan. 21, aged 59, of pleuro-pneumonia, and was buried at Kingston, Ont. He was at one time Manager of the St. John, N.B., Railway, and afterwards Consulting Engineer, Montreal St. Ry. Latterly he has practiced as a consulting engineer, and has been acting as Vice President and General Manager, Alberta Central Ry.

The Montreal Star publishes a list of Montreal millionaires numbering 94, including Lord Strathcona, Sir Wm. C. Van Horne, Sir Thos. G. Shaughnessy, Sir H. Montagu Allan, Sir Rodolphe Forget, M.P., J. Ross, C. R. Hosmer, H. S. Holt, T. J. Drummond, G. E. Drummond, W. I. Gear, W. G. Ross, R. B. Angus, R. Reford, M. H. Hersey, N. Curry, E. T. Galt and Hugh Paton.

The Canadian Ticket Agents' Association has had the following additions to its membership recently in Ontario:—S. Young, G.T.R., Lucknow; A. T. Agar, C.P.R., Sudbury; J. H. Welch, K. and P.R., Kingston; R. McKenzie, C.P.R., Thedford; G. Sylvester, C.P.R., St. Joachim; J. J. Corley, C.P.R., Midland; W. J. Jones, C.P.R., Parry Sound; A. M. Chapman, Frankford.

G. H. Massy, Chief Engineer and director, Reid Newfoundland Co., who died at Westmount, Que., recently, was born in Ireland. He came to Canada in 1871, and subsequently was engineer in charge of the construction of the Chaudiere bridge, Ottawa, the C.P.R. bridge over the St. Lawrence River at

P250 John Paul,
District Freight Agent, Canadian Northern Ry., Winnipeg.

Lachine, Que., and the Sault Ste. Marie bridge. He was connected with the Reid Newfoundland Co. since 1897.

Sir Rodolphe Forget, M.P., President, Richelieu and Ontario Navigation Co., and Lady Forget, were passengers on a

P251 J. H. Guess,
General Purchasing Agent, Grand Trunk Railway.

train between Montreal and Quebec which was in a collision near the latter city, Jan. 8. They escaped injury. Sir Rodolphe was the principal guest at a dinner given by the Choral Society of St. Louis de France, of which he is honorary vice president, in Montreal, Jan. 11.

A. C. Egan, who has been appointed Auditor of Agencies, Canadian Northern Ry., Winnipeg, was born there Oct. 6, 1883, and entered railway service Aug. 15, 1901, since when he has been, to Aug. 15, 1904, accountant, Local Freight Department, C.P.R., Winnipeg; Aug. 15, 1904, to May 1, 1909, in C.N.R. Audit Department, Winnipeg; May 1, 1909, to Dec. 1, 1911, Chief Travelling Auditor, C.N.R., Winnipeg.

F. N. Gibbs, M. Can. Soc. C.E., eldest son of F. E. Gibbs, Chief Grain Inspector, Western Division, Winnipeg, died in London, Eng., Dec. 28, aged 38, after an operation to remove an abscess near one of his ears. He graduated from the Royal Military College, Kingston, Ont., and at the time of his death was a member of the firm of McDonald, Gibbs and Co., engineers, London, Eng., who are building a railway in Chile. He was buried at Oshawa, Ont.

A. Shields, who has been appointed General Master Mechanic, Canadian Northern Ry., Winnipeg, and whose portrait appears in this issue, entered railway service in 1880, as apprentice, Credit Valley Ry. (now a part of the C.P.R.), Toronto, and from 1886 to 1901 was in the mechanical department, G.T.R., at Port Huron, Mich.; 1901 to 1903, locomotive foreman, C.P.R., and since 1903 he has been in C.N.R. service, latterly as Master Mechanic at Winnipeg.

J. M. Woodman, who has been appointed Superintendent of Winnipeg terminals, C.P.R., is a Canadian by birth, and in 1884 was employed by the C.P.R. as yard clerk at Winnipeg. From 1884 to 1886 he was in Hamilton and Northwestern Ry. service, Hamilton, Ont., since when he has spent the time in the United States, where he has been chiefly associated with the working of terminal yards at various points, mainly St. Louis and Chicago, latterly with the Indiana Harbor Belt Ry.

D. T. Main, who has been appointed Master Mechanic, Saswatchewan Division, C.P.R., Moose Jaw, and whose portrait appears in this issue, was born at Kirkintilloch, Scotland, and came to Canada in 1903, when he entered Mackenzie, Mann and Co.'s service as draughtsman, and in 1904 transferred to the C.P.R., and was, from 1907 to Mar., 1908, locomotive foreman, Minnedosa, Man.; Mar., 1908, to Mar., 1910, locomotive foreman, Cranbrook, B.C.; Mar., 1910, to Jan., 1912, District Master Mechanic, District 1, British Columbia Division, Nelson.

A. E. McMaster, whose appointment as General Agent, G.T.P. Ry., G.T.P. Coast Steamship Co., and G.T.R., at Prince Rupert, B.C., was announced in our last issue, was born at Perth, Ont., Oct. 22, 1885, and entered railway service early in 1903, since when he has been, to 1907, consecutively, clerk, C.P.R., Keewatin, Ont., and in various capacities in C.P.R. freight and ticket offices, Port Arthur, Ont., and chief clerk and acting agent there; Aug., 1907, to Sept., 1908, consecutively, chief clerk to Trainmaster and Locomotive Foreman, chief clerk to Superintendent, and agent, G.T.P.R., Fort William, Ont.; Sept., 1908, to Dec. 31, 1911, agent, G.T.P.R., Prince Rupert, B.C.

O. L. Dickeson, who has been elected President, White Pass and Yukon Route, Vancouver, B.C., was born at Ottumwa, Ia., Sept. 16, 1877, and entered railway service, Jan. 18, 1899, since when he has been, to 1901, stenographer in transportation department, Chicago, Burlington and Quincy Rd.; 1901 to 1905, chief clerk, same department, same road; 1905 to 1908, Superintendent of Transportation, lines west of Missouri River, same road, Omaha, Neb.; 1908 to

Apr. 24, 1911, Special Inspector of Transportation, same road, Chicago, Ill.; Apr. 24 to Dec. 31, 1911, Vice President, White Pass and Yukon Route, Vancouver, B.C., and since Sept., 1911, also General Manager, same company.

J. Kyle, who has been appointed Master Mechanic, Western Division, C.N.R., Edmonton, Alta., was born at Toronto, Apr. 11, 1877, and entered railway service in 1893, since when he has been, to Jan., 1899, apprentice and machinist, G.T.R. shops, Toronto, and Niagara Falls, Ont.; Jan., 1899, to Mar., 1902, machinist, C.P.R. shops, Winnipeg; Mar., 1902, to Jan., 1903, shop foreman, C.P.R. roundhouse, Winnipeg; Jan. to Feb., 1903, acting Locomotive Foreman, C.P.R., Winnipeg; Feb., 1903, to Jan., 1907, General Foreman of Shops, Canadian Northern Ry., Winnipeg; Jan. to Dec., 1907, Assistant Master Mechanic, same road, Winnipeg; Dec., 1907, to Jan., 1912, Assistant Master Mechanic, same road, Edmonton, Alta.

John Paul, who has been appointed District Freight Agent, C.N.R., Winnipeg, and whose portrait appears in this issue, was born in Euphrasia tp., Ont., Sept. 13, 1853, and entered railway service in Aug., 1879, since when he has been, to May, 1881, agent, Northern Ry., Creemore, Ont.; May, 1881, to Oct., 1883, agent, same road, Thornbury, Ont.; Oct., 1883, to Aug., 1885, in private business; Aug., 1885, to Apr., 1890, successively relieving operator, ticket clerk, G.T.R., St. Catharines and London, Ont.; Apr., 1890, to Feb., 1905, City Passenger and Ticket Agent, Michigan Central Rd., London, Ont., and from Nov., 1894, also City Freight Agent, same road; Mar., 1905, to Jan., 1912, General Freight and Passenger Agent, Niagara, St. Catharines and Toronto Ry., St. Catharines, Ont.

J. H. Guess who has been appointed General Purchasing Agent, G.T.R., Montreal, and whose portrait appears in this issue, was born at Raleigh, N.C., Feb. 5, 1878, and entered railway service in 1895, since when he has been, to May, 1900, telegraph operator, Seaboard Air Line Ry.; May, 1900, to Feb., 1901, clerk to Vice President and General Manager, Seaboard Air Line Ry.; Feb., 1901, to Mar., 1902, clerk to Vice President and General Manager, Atlanta, Birmingham and Atlantic Rd.; Mar., 1902, to Sept., 1905, Assistant General Purchasing Agent, National Ry. of Mexico, and in 1905, was also appointed Assistant Secretary-Treasurer, same road; Sept., 1905, to Sept., 1910, General Purchasing Agent, National Ry. of Mexico; Sept., 1910, to Jan. 1, 1912, Assistant General Purchasing Agent, G.T.R., Montreal.

In the New Year's list of honors conferred by the King, the following persons associated with Canadian transportation interests were included:—E. B. Osler, M.P. for West Toronto, director, C.P.R., President, Niagara Navigation Co., and director, St. Lawrence and Chicago Steam Navigation Co., knight bachelor; T. Skinner, director, C.P.R. and Dominion Atlantic Ry., and Deputy Governor, Hudson's Bay Co., London, Eng., baronet; Lt.-Col. Rodolphe Forget, M.P. for Charlevoix and Montmorency, Que., President, Richelieu and Ontario Navigation Co., and Quebec Ry., Light, Heat and Power Co., director, Toronto Ry. and Canadian General Electric Co., knight bachelor; Col. the Hon. J. M. Gibson, Lieut.-Governor of Ontario, formerly President, now director, Dominion Power and Transmission Co., Knight Commander of the Order of St. Michael and St. George.

Lieut. J. P. Dickson, who died at Ottawa, Jan. 4, was a son of M. C. Dickson, formerly District Passenger Agent, G.T.R., Toronto, later G.T.R. agent at Woodstock, Ont., and now Industrial Commissioner for the town of Woodstock. He was born at Bothwell, Ont., in 1874, and entered railway service in 1886, in the General Passenger Department, C.P.R., Montreal; 1887 to 1888, in Division Engineer's Office, C.P.R., Chatham, Ont., remaining in that department, as assistant, until the completion of the line from London to Windsor; 1891 to 1895, chief clerk to Superintendent, C.P.R., Ottawa; 1895 to 1906, Secretary, Canadian Railway Accident Insurance Co., Ottawa. He then became interested in the Cobalt mining district. In 1900 he went to Europe, and later spent some time in New Mexico and Bermuda, but, on account of his illness, had eventually to give up business altogether.

P252 G. H. Hedge,
Master Mechanic, Central Division, Canadian Northern Railway.

P253 D. T. Main,
Master Mechanic, Saskatchewan Division, Canadian Pacific Railway.

G. H. Hedge, who has been appointed Master Mechanic, Central Division, C.N.R., Winnipeg, and whose portrait appears on this page, was born at Neath, Wales, May 26, 1865, and entered railway service in 1879, as machinist apprentice with the Great Western Ry., England. He came to Canada in 1884, since when he has been, from Mar., 1884, to 1890, fitter in C.P.R. shops at Ottawa, Schreiber, Montreal, Hochelaga, and again at Montreal, where he was leading hand; 1891 to 1893, Locomotive Foreman, C.P.R., Megantic, Que.; in 1893 he was transferred to Farnham, Que., and subsequently to Montreal; 1896 to 1901, General Locomotive Foreman, C.P.R., Farnham, Que.; 1901 to 1902, Locomotive Foreman, C.P.R., Medicine Hat, Alta.; 1902 to Jan., 1903, Locomotive Foreman, C.P.R., Brandon, Man.; Jan., 1903, to June, 1908, Locomotive Foreman, Canadian Northern Ry., Port Arthur, Ont.; June, 1908, to Jan., 1912, Assistant Master Mechanic, C.N.R., Winnipeg.

Matthew Neilson, M. Can. Soc. C.E., died in Montreal, Jan. 21, aged 59, of pleuro-pneumonia, and was buried at Kingston, Ont. He was born at Almonte, Ont., May 26, 1852, and from 1875 to 1877 was an apprentice with F. W. Nash, C.E., on construction and general office work on the Kingston and Pembroke Ry.; 1880, Resident Engineer of 13 miles and later transitman on location, Chicago, St. Paul, Minneapolis and Omaha Ry.; 1881 to 1885, Resident Engineer of 14 miles, C.P.R.; 1886, Resident Engineer of 14 miles, Minneapolis and Pacific Ry., and later in charge of the construction of 40 miles of the Winnipeg and Hudson's Bay Ry., and in 1887 appointed Division Engineer of the Atlantic and North West Ry. International extension. He was at one time Manager of the St. John, N.B., Railway, and afterwards Consulting Engineer, Montreal St. Ry. Latterly he has practiced as a consulting engineer, and was acting as Vice President and General Manager, Alberta Central Ry.

Ross Thompson, who has been appointed Chief Engineer, St. John and Quebec Ry., Fredericton, N.B., was born at Newry, Ireland, Jan. 1, 1865, and commenced his railway career in 1880, since when he has been, to 1882, roadman on construction, Limavady and Dunvigen Ry., county Derry, Ireland; 1882 to 1883, leveller on survey, Great American and European Short Line Ry., Pugwash to Pictou, N.S.; 1883 to 1886, Assistant to Division Engineer on construction, Lake Superior Division, C.P.R.; 1886 to 1888, Right of Way Agent and Paymaster on C.P.R. construction, Lachine to Sherbrooke, and through Maine; 1888 to 1889, transitman on location C.P.R. branches in Manitoba; 1889 to 1892, office manager on construction, Port Arthur, Duluth and Western Ry.; 1892 to 1899, Manager, Port Arthur, Duluth and Western Ry.; 1899 to 1900, in charge of tracklaying and ballasting, Canadian Northern Ry., Port Arthur westerly; 1900 to 1902, Trainmaster, Sydney and Louisburg Ry.; 1902 to 1909, in private practice, Sydney, N.S.; 1909 to Jan., 1912, Manager of Construction and Operation, Aroostook Valley Ry., Maine.

Michael McNamara, G.T.R. outside ticket agent and Great North Western Telegraph Co.'s agent at Walkerton, Ont., died there Dec. 31, age 70, of arterial sorosis. He was born in County Clare, Ireland, came to Canada when 11 years old, and went to Walkerton 42 years ago. For some time he was in business as a jeweller. He was the G.N.W.T. Co.'s agent there for 42 years, and in 1882 was appointed outside ticket agent for the old Great Western Ry., when he was installed by E. de la Hooke, now Secretary of the Canadian Ticket Agents' Association, who was then on the Great Western Ry. General Passen-

ger Agent's staff. In March, 1898, he was appointed G.T.R. outside ticket agent. He joined the Canadian Ticket Agents' Association in 1893, was its Second Vice President in 1900 and 1901, First Vice President in 1902, President in 1903 and 1904, and a member of the executive committee from 1907 until his death. In 1904 he represented the Association at the American Association of General Passenger and Ticket Agents annual meeting at Old Point Comfort, Va. He was a conservative and a Roman Catholic. Both he and Mrs. McNamara were regular attendants at the Association's annual meetings for many years. W. Jackson, Chairman, Executive Committee, represented the Association at the funeral. Mr. McNamara is the third ex-president of the C.T.A.A. who has died within the past twelve months, the other two being W. Bunton, Peterboro, and C. E. Morgan, Hamilton.

W. J. Camp, who has been appointed Assistant Manager of Telegraphs, C.P.R., Montreal, was born at Oakville, Ont., Apr. 22, 1855, and at about the age of 17 was engaged in the G.T.R. freight office at Prescott, Ont., where he learned telegraphy. He entered the Dominion Telegraph Co. service Sept., 1874, as operator, and took up the study of wire testing and switching. In 1875 he was moved to Montreal as bookkeeper same company, and in 1876 was appointed local manager same company at Watertown, N.Y. Leaving this service towards the end of the same year, he was engaged at various points on the New York Central and Troy and Boston Rys., and for the Western Union Telegraph Co. at Albany, N.Y., re-entering the Dominion Telegraph service at Montreal, in 1877, becoming night chief operator; Jan., 1878, appointed train dispatcher, Quebec, Montreal and Ottawa Ry., now a portion of the C.P.R., returning later to the Dominion Telegraph Co. as night chief operator, and on the consolidation of the Dominion and Montreal Telegraph Cos., was appointed assistant day chief operator; local electrician, same company, Montreal, until July, 1883; July, 1883, to Sept., 1884, operator, C.P.R., Hochelaga, Que.; Sept., 1884, to Apr., 1886, in private business; Apr., 1886, to Dec., 1899, Chief Electrician, C.P.R. Telegraphs, Montreal; Dec., 1889, to Nov., 1903, Superintendent of Telegraphs, Eastern Division, covering territory between Louisburg, N.S., and Port Arthur, Ont.; Nov., 1903, to Jan. 1, 1912, Electrical Engineer, C.P.R. Telegraphs. F. E. Camp, Inspector of Construction and Maintenance, C.P.R. Telegraphs, British Columbia Division, is his elder son.

The Railway to Hudson Bay.

A return was presented in the House of Commons Jan. 15, giving details of tenders submitted for the building of the Pas Mission-Split Lake section of the line. Tenders were received from four firms—three Canadian and one United States—each bidder submitting two prices based on slight variations in the work. The United States tender was ruled out on account of some irregularity, and the lowest, that of J. D. McArthur, Winnipeg, was accepted. The figures submitted by the three Canadian firms were:—

J. D. McArthur	$3,078,354	$3,167,104
Northern Construction Co.	3,080,109	3,087,059
M. J. O'Brien	3,368,537	3,295,787

Niagara Fruit Growers Tramways Co.—Press reports state that the Ontario Legislature will be asked at the current session to incorporate a company with this title to build tramway lines in the Niagara Peninsula. Nothing has been disclosed as to the routes of the projected lines, or as to the interests behind the project.

Steam Railway Track Laid in 1911.

In the particulars of steam railway track laid in 1911, published in our last issue, the figures for some of the lines were estimated. Complete returns have since been received in response to our requests and the revised figures are given below. They show some variations from those given in our last issue, but do not materially affect the totals on the different lines, while the actual mileage laid is increased from 1,827.33 to 1,851.98, which is about 18 miles under that laid in 1910. In some sections of the country tracklaying had to be suspended earlier than was anticipated, hence the alteration of the mileages which it was estimated would be laid on some of the C.P.R. lines, and a shortage of steel was experienced on Canadian Northern Ry. and G.T. Pacific Ry. branch lines. Following are the revised and complete figures:—

ALBERTA CENTRAL RY.—		
Red Deer to Red Deer River	7.00	
ALGOMA CENTRAL AND HUDSON BAY RY.—		
Mileage 81.6 to 99	17.40	
Mileage 153.0 to 115	38.00	
Magpie branch, m. 5.4 to 9.42	4.02	
		59.42
ALGOMA EASTERN RY.—		
Espanola to Spanish River, Ont.	4.60	
Espanola southerly, Ont.	1.50	
		6.10
ATLANTIC, QUEBEC AND WESTERN RY.—		
Barachois to Douglastown, Que.		20.50
BRANDON TRANSFER RY.—		
Brandon, Man.		1.20
CANADIAN NORTHERN ONTARIO RY.—		
TORONTO-OTTAWA LINE FROM WEST OF OSHAWA TO DESERONTO.		
Mileage 44.6 to 69.4	24.80	
Mileage 71.7 to 71.8	.10	
Mileage 96.6 to 133.9	37.30	
SUDBURY-PORT ARTHUR LINE.		
Gowganda Jct. to Ruel, Ont.	13.00	
		75.20
CANADIAN NORTHERN PACIFIC RY.—		
Port Mann to Chilliwack, B.C.		46.00
CANADIAN NORTHERN RY.—		
MANITOBA.		
Shellmouth branch from Hampton		12.96
SASKATCHEWAN.		
Grosse Isle northerly	26.37	
Ceylon westerly	17.41	
Walta northerly	17.41	
Shellbrook westerly	37.00	
Pelly westerly	34.26	
Delisle southerly	46.00	
Radville northerly	82.00	
ALBERTA.		
Red Deer River southerly	22.30	
Morinville northerly	55.50	
St. Albert westerly	20.00	
Stewartwyn westerly	65.00	
		446.10
CANADIAN NORTH EASTERN RY.—		
Mileage 7.5 to 13.5 from Stewart, B.C.		11.00
CANADIAN PACIFIC RY.—		
ONTARIO.		
Coldwater Jct. to Bethany Jct.	76.50	
SASKATCHEWAN.		
Moose Jaw Jct. to Dunkirk	26.80	
Swift Current Jct. to Neville	27.00	
Swift Current north to Cabri	33.00	
Wilkie Jct. to Cutknife	27.80	
Imperial to Valeport	59.00	
Near Silton to Valeport	7.00	
Ageard to Viceroy	23.80	
Near Anglier to Conquest	53.00	
ALBERTA.		
Lethbridge-Aldersyde	56.80	
Castor-Coronation	22.00	
Nightingale to Standard	17.50	
BRITISH COLUMBIA.		
Colvalli-Fort Steele	25.00	
Galloway-Waldo	10.00	
		465.20
ESQUIMALT AND NANAIMO RY.—		
Cameron Lake to Port Alberni, B.C.		26.00
GRAND TRUNK RY.—		
Birch to Tay, Ont.		8.90
GRAND TRUNK PACIFIC RY.—		
SASKATCHEWAN.		
Balcarres to Regina	61.00	
Meacham to Wakaw	42.00	
ALBERTA.		
Red Deer southerly	22.00	
Bickerdike southerly	30.00	
Pedley, on main line to B.C. boundary	74.00	
BRITISH COLUMBIA.		
Yellowhead westerly	25.00	
		254.00
HA HA BAY RY.—		
Riviere du Moulin to Laterriere, Que.		10.00
KETTLE VALLEY LINES—		
Midway to Westledge, B.C.	25.00	
Merritt to Coldwater, B.C.	30.00	
		55.00
MIDLAND RY. OF MANITOBA—		
From C.N. Ry. to station in Winnipeg		8.00
NATIONAL TRANSCONTINENTAL RY.—		
NEW BRUNSWICK.		
Mileage 184 to 184.73	.73	
QUEBEC.		
At points between mileage 283.15 and 454.45	59.74	
Mileage 676.97 to 710.33	33.36	
Mileage 772.02 to 834.23	62.21	
ONTARIO.		
Mileage 1131.24 to 1197.45	66.21	
Mileage 1450.04 to 1508.04	58.00	
		280.25
QUEBEC AND SAGUENAY RY.—		
Mileage 56.54 to 64, near Murray Bay		7.50
SOUTH ONTARIO PACIFIC RY.—		
Guelph Jct. to Progresston, Ont.		5.90
SYDNEY AND LOUISBURG RY.—		
Morien to Birch Grove		2.50
TEMISKAMING AND NORTHERN ONTARIO RY.—		
Iroquois Falls to Timmins	33.71	
North Bay Jct. to Nipissing Jct.	3.53	
		37.24
TORONTO, HAMILTON AND BUFFALO RY.—		
Spur lines Hamilton, Ont.		0.97
VANCOUVER, VICTORIA AND EASTERN RY.—		
Princeton to Coalmount	12.00	
Abbottsford to Kilgard	6.00	
		18.00
Total		1,851.98
Actual track laid in 1910		1,869.24

Of this mileage 1,609.65 miles were laid in connection with three systems, the following being a comparison of the mileage laid by the same lines in 1910 and 1911:—

	Miles. 1911.	Miles. 1910.
Canadian North Eastern Ry.	11.00	....
Canadian Northern Ontario Ry.	75.20	71.70
Canadian Northern Pacific Ry.	46.00	....
Canadian Northern Ry.	446.10	521.96
	578.30	593.66
Canadian Pacific Ry.	465.20	286.58
National Transcontinental Ry.	280.25	312.00
Grand Trunk Pacific Ry.	254.00	309.00
	534.25	521.00
Total of the three systems	1,609.65	1,651.24

The remaining 242.33 miles were laid by 13 lines.

In addition to the new track laid on the Canadian Northern Ontario Ry.'s Toronto-Ottawa line, three miles of track were laid on a revision of location of the Bay of Quinte Ry. between Harrowsmith and Sydenham.

Divided by provinces the track laid during 1910 and 1911 compares as follows:—

	1911. Miles.	1910. Miles.
Saskatchewan	630.74	518.84
Ontario	394.44	308.98
Alberta	392.10	365.63
British Columbia	216.00	117.80
Quebec	193.31	232.10
Manitoba	22.16	141.49
Nova Scotia	2.50	4.00
New Brunswick	0.73	180.40
	1,851.98	1,869.24

St. Lawrence and Adirondack Ry.—A dividend of 4% for the past year has been paid. The last previous dividend paid was in respect of 1908 and was also 4%. The stock is held by the New York Central Lines.

Oregon-Washington Rd. and Navigation Co.—A Vancouver dispatch, Jan. 18, says J. D. Farrell, President of the O.-W. Rd. and N. Co., has announced that it is intended to build a direct line from Seattle, Wash., to Vancouver, B.C. No statement was made as to when it is expected to start operations.

The cases against four clerks in the C.P.R. ticket office, Toronto, for forgery and theft in connection with rebates on unused portions of tickets, were disposed of Jan. 3, as follows:—B. A. Bennett, two years' imprisonment for forgery and theft; J. J. McPherson, three months in jail on similar charges; J. J. Adamson, forgery, dismissed on the ground that there was no intent to defraud, and R. Lalor was acquitted.

Transportation Appointments Throughout Canada.

Algoma Central and Hudson Bay Ry., Algoma Eastern Ry.—F. K. Allen has been appointed Purchasing Agent, vice W. G. Webber, appointed Purchasing Agent, Algoma Steel Co., and Lake Superior Iron and Steel Co. Mr. Allen is also Purchasing Agent, International Transit Co., Trans-St. Mary Traction Co., Lake Superior Power Co., Tagona Water and Light Co., and Algoma Commercial Co. Office, Sault Ste. Marie, Ont.

Canadian Northern Ry.—I. L. Healey, heretofore Contracting Freight Agent, Toronto, has been appointed Travelling Freight Agent, Toronto, vice R. A. Lennox, transferred to Hamilton, Ont.

C. H. Green, heretofore Contracting Freight Agent, Hamilton, Ont., has been appointed Contracting Freight Agent, Toronto.

R. Logan, heretofore in General Freight Agent's office, Toronto, has been appointed Contracting Freight Agent, Hamilton, Ont., vice I. L. Healey, transferred to Toronto.

R. A. Lennox, heretofore Travelling Freight Agent, Toronto, has been appointed Travelling Freight Agent, Hamilton, Ont.

T. Grimes, formerly General Yardmaster, Toronto terminals, C.P.R., has been appointed Yardmaster, C.N.R., Port Arthur, Ont., vice W. C. Turner, assigned to other duties at Winnipeg.

A. Shields, heretofore Master Mechanic, has been appointed General Master Mechanic. Office, Winnipeg.

A. C. Egan, heretofore Chief Travelling Auditor, Winnipeg, has been appointed Auditor of Agencies, on all lines west of Port Arthur, Ont., and all balance sheets and debit and credit papers and correspondence in connection therewith are addressed to him. Office, Winnipeg.

G. H. Hedge, heretofore Assistant Master Mechanic, Winnipeg, has been appointed Master Mechanic, Central Division. Office, Winnipeg.

John Paul, heretofore Freight and Passenger Agent, Niagara, St. Catharines and Toronto Ry., St. Catharines, Ont., has been appointed District Freight Agent, C.N.R., Winnipeg, vice J. B. Sheppard, resigned.

M. L. Flett, heretofore hotel clerk, has been appointed chief clerk, Sleeping, Dining and Parlor Car, Hotel and News Department, Winnipeg, vice W. W. Swinden, chief clerk and accountant, appointed Chief Accountant.

W. W. Swinden, heretofore chief clerk and accountant, has been appointed Chief Accountant, Sleeping, Dining and Parlor Car, Hotel and News Department, Winnipeg.

J. E. Hutcheson has been appointed Manager, C.N.R. Prince Edward Hotel, Brandon, Man.

R. R. Marsales has been appointed Contracting Freight Agent, Brandon, Man., vice T. J. Peterson, resigned.

F. Creighton, heretofore assistant ticket agent at Saskatoon, Sask., has been appointed city ticket agent, Brandon, Man.

J. Kyle, heretofore Assistant Master Mechanic, Edmonton, has been appointed Master Mechanic, Western Division. Office, Edmonton, Alta.

Canadian Pacific Ry—W. M. Godsoe, heretofore local manager, C.P.R. Telegraphs, Halifax, N.S., has been appointed Superintendent, Atlantic Division, C.P.R. Telegraphs, vice F. J. Mahon, transferred to Montreal. Office, St. John, N.B.

D. L. Jones, heretofore District Master Mechanic, Brownville Jct., Me., has been appointed District Master Mechanic and Trainmaster, District 2, Atlantic Division. Office, Woodstock, N.B.

A. Williams, heretofore Trainmaster at Woodstock, N.B., has returned to his former position as Chief Dispatcher there.

W. F. Grant has been appointed District Master Mechanic, Brownville Jct., Me., vice D. L. Jones, transferred to Woodstock, N.B.

W. F. Hackman, heretofore Resident Engineer, Schreiber, Ont., has been appointed Resident Engineer, Brownville Jct., Me., vice F. B. Tapley, acting Resident Engineer, appointed Resident Engineer, London, Ont., as announced in our last issue.

It is persistently rumored that F. P. Gutelius, M. Can. Soc. C.E., General Superintendent, Eastern Division, will receive an important appointment in connection with the Dominion Government Railways. An Ottawa press dispatch, Jan. 26, says he will be appointed, in conjunction with G. Lynch Staunton, K.C., of Hamilton, Ont., to investigate the circumstances attending the construction of the National Transcontinental Ry.

John Corbett, General Foreign Freight Agent, Montreal, is reported to have resigned to go into general insurance brokerage business, particularly marine insurance, under the style of John Corbett and Co., Ltd.

S. Houghton has been appointed Chief Inspector of Time Service, vice J. J. F. Houghton, resigned. Office, Montreal.

E. P. Flintoft and Jas. McNaught have been appointed Assistant Solicitors at Montreal.

W. A. Cowan, formerly Resident Engineer at Farnham, Que., has been appointed one of the assistant engineers in the Assistant Chief Engineer's office, Montreal, and not Inspecting Engineer, as previously mentioned. This appointment, which was mentioned in our last issue, was misplaced. It should have appeared under the heading of Canadian Pacific Ry., instead of Canadian Northern Ry.

J. G. Galley, heretofore chief rate clerk, Import Freight Agent's office, Montreal, has been appointed Contracting Import Freight Agent, Atlantic Steamship Lines, vice A. T. Shaughnessy, resigned to go into financial business. Office, Montreal.

W. J. Camp, heretofore Electrical Engineer, C.P.R. Telegraphs, has been appointed Assistant Manager, C.P.R. Telegraphs. Office, Montreal. The position of Electrical Engineer has not yet been filled.

J. Fletcher, heretofore Superintendent, C.P.R. Telegraphs, British Columbia Division, Vancouver, has been appointed Superintendent of Traffic. Office, Montreal.

D. H. Bowen, heretofore local manager, C.P.R. Telegraphs, London, Ont., has been appointed Assistant Superintendent, Ontario Division C.P.R. Telegraphs. Office, Toronto.

C. W. MacDonald, heretofore assistant night chief operator, Toronto, has been appointed local manager, C.P.R. Telegraphs, London, Ont., vice D. H. Bowen, promoted.

J. M. Woodman, Chicago, Ill., has been appointed Superintendent of Winnipeg Terminals, vice J. McLellan, who has been granted indefinite leave of absence on account of continued ill health.

W. E. Woodhouse, heretofore Superintendent of Shops, Winnipeg, has been appointed Assistant Superintendent of Motive Power, Western Lines, vice C. H. Temple, recently appointed Superintendent of Motive Power and Car Department, Western Lines. Office, Winnipeg.

R. A. Pyne, heretofore Master Mechanic, Alberta Division, Calgary, has been appointed Superintendent of Shops, Winnipeg, vice W. E. Woodhouse, promoted.

W. R. Rutherford, heretofore local manager, C.P.R. Telegraphs, Winnipeg, has been appointed Supervisor, C.P.R. Telegraphs, Souris, Man.

W. D. Neil, heretofore chief clerk to Superintendent, C.P.R. Telegraphs, Alberta Division, Calgary, has been appointed local manager, C.P.R. Telegraphs, Winnipeg, vice W. R. Rutherford, promoted.

W. Kennedy, heretofore agent, C.P.R. Telegraphs, Regina, Sask., has been appointed assistant city representative, Winnipeg.

W. K. Thompson, heretofore agent, C.P.R. Telegraphs, Saskatoon, Sask., has been appointed chief operator, C.P.R. Telegraphs, Winnipeg, vice W. J. Kane, promoted.

W. J. Kane, heretofore chief operator, C.P.R. Telegraphs, Winnipeg, has been appointed Supervisor, C.P.R. Telegraphs, Winnipeg.

J. McAnany, heretofore Road Foreman of Locomotives, District 3, Alberta Division, Macleod, has been appointed District Master Mechanic, District 3, Saskatchewan Division, vice T. Patterson, assigned to other duties. Office, Saskatoon.

D. T. Main, heretofore District Master Mechanic, District 1, British Columbia Division, Nelson, has been appointed Master Mechanic, Saskatchewan Division, vice A. T. Shortt, transferred. Office, Moose Jaw.

A. T. Shortt, heretofore Master Mechanic, Saskatchewan Division, Moose Jaw, has been appointed Master Mechanic, Alberta Division, vice R. A. Pyne, promoted. Office, Calgary.

G. Moth, heretofore acting District Master Mechanic, Medicine Hat, Alta., has been appointed Road Foreman of Locomotives, District 3, Alberta Division, Macleod, vice J. McAnany, promoted.

R. F. Richardson, heretofore chief clerk to Local Freight Agent, Calgary, Alta., has been appointed Local Freight Agent there, vice T. F. English, resigned on his appointment as collector of customs, Calgary.

W. J. Meakin, heretofore charge hand, Strathcona roundhouse, has been appointed Locomotive Foreman, Castor, Alta., vice J. Jenson, assigned to other duties in the Car Department.

M. J. Scott, heretofore locomotive engineer, District 1, British Columbia Division, Revelstoke, has been appointed District Master Mechanic, District 3, British Columbia Division, vice D. T. Main, promoted. Office, Nelson.

W. Pimlott, heretofore Storekeeper, Field, B.C., has been appointed Storekeeper at Nelson, B.C., vice J. W. Cormode, appointed chief clerk to Divisional Storekeeper at Calgary, Alta.

Jas. Oborne, General Superintendent Ontario Division, Toronto, is to be transferred to Vancouver, B.C., as General Superintendent, British Columbia Division, and will remain there about the middle of February.

Duluth, Rainy Lake and Winnipeg Ry.—J. Conery, heretofore dispatcher, has been appointed Chief Dispatcher, Virginia, Minn., vice C. W. Houston, appointed Superintendent.

Grand Trunk Pacific Coast Steamship Co.—F. Waterhouse has been appointed Manager, G.T. Pacific Dock, Seattle, Wash.

J. J. Carroll, heretofore Superintendent, G.T. Pacific Dock, Seattle, Wash., has been appointed agent, G.T.P. Coast Steamship Co., and the former position has been abolished. Office, 130 G.T.P. Dock, Seattle, Wash.

Grand Trunk Pacific Ry.—A. W. Larmour has been appointed Travelling Freight Agent. Headquarters, Winnipeg.

H. E. Bissell, heretofore Assistant Right of Way and Claims Agent, has been appointed Right of Way and Claims Agent, vice G. H. Pope, superannuated. Office, Winnipeg.

J. B. Shelton has been appointed Car Foreman at Transcona, Man., vice J.

Flynn, transferred to Edmonton, Alta.

R. W. Gibson has been appointed agent at Cabot, Man.

A. Bell, heretofore Locomotive Foreman, Wainwright, Alta., has been appointed Locomotive Foreman, Transcona, Man., vice R. Gardiner, assigned to other duties.

G. E. Brooks has been appointed Locomotive Foreman at Wainwright, Alta., vice A. Bell, transferred.

J. Flynn, heretofore Car Foreman at Transcona, Man., has been appointed Car Foreman at Edson, Alta.

T. C. Chalmers has been appointed Agent at Prince Rupert, B.C., vice A. E. McMaster, appointed General Agent, as announced in our last issue.

Grand Trunk Ry.—C. M. Hays, President, issued the following circular Jan. 1: "It is with great regret that I announce the retirement of A. Butze, General Purchasing Agent, under provisions of the pension fund. Mr. Butze since his connection with this company for the past 16 years, has filled the important position he held with exceptional faithfulness and fidelity, and his friends and associates among officers and employes of the company, as also others who know him, will I am sure join me in the earnest wish that he may have many years of well earned rest."

J. H. Guess, heretofore Assistant General Purchasing Agent, has been appointed General Purchasing Agent, vice A. Butze, retired. Office, Montreal.

R. Johnson, heretofore chief clerk, Stores and Purchasing Departments, has been appointed Assistant General Purchasing Agent, vice J. H. Guess, promoted. Office, Montreal.

The following agents have been appointed:—Trenton, Ont., A. J. Adams; North Bay, Ont. (freight), W. A. McCutcheon; Hamilton, Ont. (Stuart St. pass.), P. A. Robertson; Burford, Ont., C. S. Kerton; Barrys Bay, Ont., F. O. Parent (relieving).

Hudson Bay Ry.—J. P. Gordon, Winnipeg, is reported to have been appointed Assistant Chief Engineer of the Dominion Government railway from Pas Mission, Sask., to Hudson Bay.

Intercolonial Ry.—W. A. Dube, Superintendent at Levis, who has been under suspension, as mentioned in our last issue, has been dismissed. The charges of political partisanship were not sustained, but the commissioner appointed by the Minister of Railways to make the investigation reported that charges of personal misconduct had been proved.

J. S. Leighton, Claims Agent, and F. X. Talbot, lost freight tracer, Moncton, N.B., have been dismissed.

Lehigh Valley Rd.—W. T. Grier has been appointed General Coal and Freight Agent. All correspondence and reports relating to coal and coke traffic should be forwarded to him, and he will also have charge of such other traffic or assume other duties as may hereafter be assigned to him. Office, 143 Liberty St., New York.

S. A. Story has been appointed Through Freight Agent. Office, Buffalo, N.Y.

Minneapolis, St. Paul and Sault Ste. Marie Ry.—W. R. Sheldon, General Agent, Helena, Mont., is reported to have been appointed District Freight and Passenger Agent, Calgary, Alta.

National Transcontinental Ry.—The Minister of Railways has introduced a bill in the House of Commons to abolish the commission of four members, which has hitherto administered the affairs connected with construction, and to vest all the powers in one commissioner. This will place the whole work under the present Chairman, R. W. Leonard, M. Can. Soc. C.E.

The position of Purchasing and Right of Way Agent, District F., Winnipeg, hitherto held by T. L. Morton, is reported to have been abolished on the ground that it is no longer a necessity for that district.

New York Central Lines.—Carl Howe, in addition to his duties as Manager of the N.Y.C. fast freight lines, has been given jurisdiction over all the outside agencies located at points off or beyond N.Y.C. lines.

R. J. Ross has been appointed Commercial Agent of the New York Central and Hudson River Rd., West Shore Rd., Boston and Albany Rd., Pittsburg and Lake Erie Rd., Cleveland, Cincinnati, Chicago and St. Louis Ry., Lake Shore and Michigan Southern Ry., Michigan Central Rd., Chicago, Indiana and Southern Rd., Lake Erie and Western Rd., Toledo and Ohio Central Ry., Zanesville and Western Ry., New York and Ottawa-Ottawa and New York Rys., Merchants Despatch, Merchants Despatch-Dairy Line, Red Line, White Line, Blue Line, Canada Southern Line, West Shore Line, Nickel Plate Line, North Shore Despatch, Jersey Central-Lake Shore Despatch, Jersey Central-Michigan Central Despatch, Rutland-Michigan Central Line. Office, Bank of Nova Scotia Building, Winnipeg.

C. H. Hogan has been appointed Assistant Superintendent of Motive Power, Eastern District, Hudson, Harlem, New York and Poughkeepsie, River, Mohawk and Adirondack Divisions. Office, Albany station, N.Y.

A. J. Fries has been appointed Assistant Superintendent of Motive Power, Western District, Buffalo, Rochester, Western Ontario, St. Lawrence and Pennsylvania Divisions. Office, Depew, N.Y.

L. H. Raymond has been appointed Superintendent of Shops, West Albany, N.Y.

H. Wanamaker has been appointed Superintendent of Shops, Depew, N.Y.

The positions of District Superintendent of Motive Power at West Albany and Depew have been abolished.

Pere Marquette Rd.—J. E. Williams having resigned as Assistant General Freight Agent, to accept service on the Uniform Classification Committee, the duties of his office will be assumed by the General Freight Department, under the immediate direction of R. P. Paterson, Assistant General Freight Agent.

A. H. Greenly has been appointed Chief of Tariff Bureau, in charge of the compilation and publication of tariffs, reporting to the Assistant General Freight Agent. Office, Detroit, Mich.

F. G. Bement, heretorore Trainmaster, G.T.R., Durand, Mich., has been appointed Inspector of Transportation, P.M. Rd. Office, Detroit, Mich.

Quebec Ry., Light and Power Co.—A circular issued by Sir Rodolphe Forget, President, Quebec, Ry., Light, Heat and Power Co., announces that H. G. Matthews, heretofore Assistant to the President, has also been appointed General Manager, vice C. E. A. Carr resigned. Another circular issued by W. G. Ross, President Quebec Ry., Light and Power Co. announces that Mr. Matthews has been appointed to a similar position in that company. The Quebec Ry., Light, Heat and Power Co. is the holding company, the railways being operated by its subsidiary the Quebec Ry., Light and Power Co.

Reid Newfoundland Co—The position of Chief Engineer has become vacant by the death of G. H. Massy, M. Can. Soc. C.E.

E. J. Hoskins has been appointed Assistant to the Superintendent. Office, St. John's.

St. John and Quebec Ry.—Ross Thompson, heretofore Manager of Construction and Operation, Aroostook Valley Ry., has been appointed Chief Engineer, St. J. and Q.R. Office, Fredericton, N.B.

Thousand Islands Ry., Oshawa Ry.—H. W. Cooper, heretofore chief clerk, Treasurer's Department, G.T.R., Montreal, has been appointed Secretary and Treasurer, T.I. Ry. and O. Ry., vice C. A. Milliner, resigned. Office, Deseronto, Ont.

Wabash Rd.—F. H. Wegener, heretofore Travelling Freight and Passenger Agent, Seattle, Wash., has been appointed General Agent, Seattle, Wash., vice W. D. Stubbs, resigned to engage in other business.

White Pass and Yukon Route.—O. L. Dickeson, heretofore Vice President and General Manager, has been elected President, vice S. H. Graves, deceased. Office, Vancouver, B.C., in summer, and Chicago, Ill., in winter.

Railway Finance, Meetings, Etc.

Alberta Ry. and Irrigation Co.—The company's railway, coal mines, lands and other properties passed under the control of the C.P.R. Jan. 1. The C.P.R. acquired the whole of the outstanding common stock of the company at 150, and under the terms of the lease will pay as rental an amount sufficient to pay a dividend of 6% on the common stock, and the interest on the outstanding debenture stock.

Notice is given that the London, Eng., share register was permanently closed on Dec. 31, and that in future any transfers must be forwarded, together with the stock certificates, to the Bank of Montreal, London, for transmission to the Royal Trust Co., Montreal, who are the registrars of the company in Canada, for the issuance and return to the owners of new certificates with endorsement thereon of the Canadian Pacific Ry. Co.'s guarantee of interest at the rate of 6% per annum, payable July 1 and Jan. 1 in each year, as provided by the agreement of lease and sale to the C.P.R. Co.

Atlantic, Quebec and Western Ry.—Respecting the conviction of A. W. Carpenter, in connection with the failure of the Charing Cross Bank, London, Eng., which was chiefly concerned in the financing of this railway, it is stated, that British investors are interested in the 5% first mortgage bonds issued in 1906, of which £325,500 was issued to contractors. Interest has been regularly paid, and it is stated that the subsidies, when received, will be deposited with the trustees for the debenture holders, and should be sufficient to meet the interest until Dec. 31, 1915. The bonds are not quoted on the London Stock Exchange, but transactions have recently taken place at about 10% discount. The issue prices were 96 and 98.

Brockville, Westport and Northwestern Ry.—Mackenzie, Mann and Co. have been directed to pay into court in Toronto $8,972 to the credit of eight unknown bondholders in connection with the purchase of the railway. As Mackenzie, Mann and Co. were already holders of all the bonds of the company except the eight in question, an order was made dispensing with the payment into court of the rest of the purchase money.

Canadian Pacific Ry.—A cablegram of Jan. 4 says application has been made to the London, Eng., Stock Exchange for the listing of £1,000,000 of non-cumulative 4% preferred stock, and £1,000,000 of consolidated 4% debenture stock.

Dominion Atlantic Ry. — Passenger earnings for Dec., 1911, $51,200; freight earnings, $62,400; total, $113,600; against $85,700 total for Dec., 1910.

Grand Trunk Pacific Ry.—Application is being made to the Dominion Parliament for authority to make a further issue of perpetual or terminable debenture stock not exceeding in the whole £5,000,000, the proceeds to be applied to the completion of the company's main and branch lines, and the purchase of rolling stock.

Grand Trunk Railway.—The Dominion Parliament is being asked to authorize the company to acquire or otherwise deal with the first mortgage bonds issued by the G.T. Western Ry., not exceeding $30,000,000; to aid or assist other companies in various ways in the name of the G.T.R. or the G.T. Pacific Ry., or in the name of trustees for the benefit of either of them; and for these purposes to issue further G.T.R. consolidated 4% debenture stock to an amount the interest upon which shall not exceed £250,000.

Quebec Central Ry.—Gross earnings for Nov., 1911, $112,294; expenses, $78,-131.30; net earnings, $34,162.70, against $85,619.02 gross earnings; $59,140.29 expenses; $26,478.73 net earnings for Nov., 1910. Aggregate gross earnings for five months ended Nov. 30, 1911, $622,557.07; expenses, $401,572.57; net earnings, $220,984.50, against $549,486.71 aggregate gross earnings; $353,733.31 expenses; $195,753.40 net earnings for same period 1910.

Temiscouata Ry.—Gross earnings for Nov., 1911, $16,417.31; expenses, $13,-583.64; net earnings, $2,833.67.

Victoria and Sidney Ry.—Press reports from Victoria, B.C., state that the V. and S. Ry. is likely to pass into the hands of the Canadian Northern Ry. interests. The line is at present owned by the Great Northern Ry.

White Pass and Yukon Ry.—Aggregate gross earnings from Jan. 1 to Dec. 14, 1911, $1,063,220, against $1,194,370 for same period 1910.

The Kent Northern Railway Changes Ownership.

The Kent Northern Ry. has been sold to a Toronto syndicate, which has already taken possession. The syndicate is headed by Sir Henry M. Pellatt, stock broker, and Thos. Walmsley, insurance agent, etc., Toronto, who hold the control between them, the syndicate having acquired practically all the capital stock. The syndicate is said to have had an option on the property for several years, and to have paid amounts on account from time to time, the balance having been paid towards the end of last year. The purchase price is said to have been about $115,000, which is said to include a mortgage of about $50,-000 on the property. The new proprietors contemplate establishing steamship connection with Prince Edward Island, and also developing gravel pits which they own about three miles from the junction with the Intercolonial Ry.

The line was built in the early eighties, and extends from Kent Jct., on the Intercolonial Ry., to Richibucto, N.B., 27 miles. The Commissioners appointed in 1909 by the Dominion Government to investigate the branch lines connecting with the Intercolonial Ry. reported that the line runs through a flat country, sloping towards Northumberland Strait, the maximum gradient being 1.5%, except in the case of a few local sags of a few hundred feet in length; there are a few curves, and these are of ample radius. The track is laid with 56 lb. rails bought from the Intercolonial Ry., and the largest bridge structure has a 16 ft. span. The Commissioners mentioned various works necessary to bring the line up to a standard which would permit its being taken over as a branch line. In addition to the station buildings there is a three stall enginehouse at Richibucto. The rolling stock consists of two locomotives, one passenger car, one combination freight and express car and two snow ploughs.

For the first 20 years of its existence the railway was managed by J. C. Brown, the principal stockholder. About the end of 1902 the line was sold to a local syndicate consisting of T. O. Murray, R. Phinney, W. D. Carter, J. Jardine and G. M. Robertson, and a new act of incorporation was obtained from the New Brunswick Legislature. Until the sale to the new syndicate the officers of the company have been: President, J. Jardine; General Manager, T. O. Murray; Secretary, R. Phinney; Treasurer, W. S. Carter. It is stated that T. O. Murray will remain as Manager.

Subsequent to building the K.N. Ry., the Richibucto and St. Louis Ry. was built. This line is an extension of the K.N. Ry., from Richibucto to St. Louis, seven miles. It was operated for some time under lease by the K.N.R., but fell into bad repair, and on the bridge over the Kouchibougouacis River becoming unsafe, its operation was abandoned. The Dominion Government Commissioners' report says: "This line could be operated in connection with the K.N. Ry. at very small cost, and would give accommodation to a population (2,000) now deprived of it."

The Dominion Government report shows the capital of the Kent Northern Ry. outstanding at $75,000, with $50,000 of bonds, and that of the Richibucto and St. Louis Ry. at $20,000, with no bond issue. Bonuses in aid of the building of the K.N. Ry. were voted as follows: $58,334.27, including the value of used rails, from the Dominion Government; $135,000 from New Brunswick, and $5,000 from municipalities; while there was paid to the R. and St. L. Ry. $22,400 by the Dominion Government, and $21,000 by the New Brunswick Government. The net earnings of the K.N. Ry. during each year for the year ending June 30, 1906, to June 30, 1910, have been as follows: $8,075, $6,664, $8,191, $4,792, and $6,056. The figures for the year ended June 30, 1911, are not yet available.

National Transcontinental Railway Construction, Etc.

The Minister of Railways stated in the House of Commons, Jan. 12, that the three members of the Commission for the building of the transcontinental railway, appointed by the late Government, C. A. Young, C. F. McIsaac and W. S. Calvert, had been asked to resign, and that the positions would not be filled. The Government proposed to have the act appointing the commission amended to suit its new policy, and to place the whole work in charge of the present Chairman, R. W. Leonard, M. Can. Soc. C.E.

Grand Trunk Pacific Railway Construction, Etc.

C. M. Hays, President, and W. Wainwright, Second Vice President, interviewed members of the Government at Ottawa Jan. 8, when, it is said, that the whole situation connected with the financing of the balance of the construction of the line between Winnipeg and Prince Rupert was considered, and the question of the operation of the Moncton-Winnipeg section discussed. It is said that a further loan, probably amounting to $15,000,000, was asked for.

E. J. Chamberlin, Vice President and General Manager, returned to Winnipeg Jan. 13, from Montreal, and in an interview, gave details of construction projected for the current year, stating that the work would involve an expenditure of about $20,000,000. He has been advised by the Chief Engineer that the boring of the tunnels in the Kitselas district has been completed, which will enable track to be laid during the year to 185 miles easterly from Prince Rupert. It is expected also that 150 miles of track will be laid westerly from Tete Jaune Cache during the year, leaving about 200 miles of the main line to be completed in 1913. The only difficulty in the way of accomplishing this is the obtaining of sufficient men. During 1911 there were over 10,000 men engaged in construction on the main line, and it is hoped to have that number increased during the current year. While it is expected to have track laid through to the coast by the end of 1913, it is not expected to have the line in operation until some time in 1914.

The section of the line west of Tete Jaune Cache, which it is hoped to complete during the coming year, extends from the Cache to Fort George, B.C., and on this mileage sub-contracts are reported to have been let as follows:—H. E. Carleton and Co., Edmonton, 25 miles westerly from the Cache; Burns, Jordan and Co., Spokane, Wash., the next 50 miles; Sims Bros. and Keary, St. Paul, Minn., 75 miles.

In an interview at Victoria, Jan. 11, D'Arcy Tate, K.C., the company's solicitor at Winnipeg, is reported as having stated that he had just returned from Prince Rupert after ratifying the contract for the last section of the line between Tete Jaune Cache and Aldermere, B.C. Instructions had been given that the work was to be pushed with all possible dispatch, and he was satisfied that he was quite within the mark when he said that the line would be completed by the end of 1913.

As to branch line construction it is hoped during the summer to link up the main line with Brandon, Moose Jaw, Calgary, Lethbridge, Prince Albert and Battleford. Regina was linked up in the fall of 1911, and it is proposed to provide terminal accommodation, and to build a large hotel there during the current year. The extension of the line from Regina to the International boundary is expected to be completed this year. A considerable amount of grading had been done on the branch lines, and more steel would have been laid during 1911 but for the fact that the rails ordered could not be delivered, the deliveries being some 18,000 tons short. If the company can get the necessary rails it is hoped to lay 600 miles of track on branch lines this year. The following gradings are ready for tracklaying:—Hart-Brandon branch, 20 miles; Regina to International boundary, 143 miles; Regina to Moose Jaw, 56.5 miles; Moose Jaw northwesterly, 57.6 miles; Prince Albert branch, 51 miles; Battleford branch, 57 miles; Cutknife branch, 50 miles; Biggar-Calgary branch, 60 miles completely and 40 miles partially graded; Tofield-Calgary line, 94 miles; Brazeau coal branch, 23 miles. Further grading will be done on these lines, and it is expected to let a contract at an early date for the grading of a line from Calgary to Lethbridge, about 150 miles.

A very complete, illustrated description of the Prince Rupert marine terminal, dry dock, ship repairing plant, etc., is given in the Marine Department, further on in this issue.

Canadian Railway Club.—The tenth annual dinner was held in Montreal, Jan. 19, A. A. Goodchild, President, in the chair. The speakers to the various toasts included the President, the Minister of Railways, H. H. Vaughan, F. P. Gutelius, W. McNab, G. H. Ham, F. Gardiner, N. Curry, President of the Canadian Car and Foundry Co., and Professors McLeod and McKay of McGill University. The club, which was organized with less than 100 members, now has over 800.

The International Railway Fuel Association's fourth annual convention will be held at the Hotel Sherman, Chicago, Ill., May 22-25. T. Duff Smith, Fuel Agent, Grand Trunk Pacific Ry., Winnipeg, is President.

Orders by the Board of Railway Commissioners.

Beginning with June, 1904, we have published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed our paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates given of orders, immediately following the numbers, are those on which the hearing took place and not those on which the orders were issued. In many cases orders are not issued for a considerable time after the dates assigned to them.

15628. Dec. 15.—Approving Alberta Central Ry. location from mileage 100 to 140, west of Red Deer.

15629. Dec. 20.—Authorizing G.T.P.R. to operate trains over overhead crossing of C.N.R. in sec. 14, tp. 53, r. 24, w. 4 m.

15630. Dec. 12.—Extending until Feb. 1, 1912, time for installation of power brakes on electric cars by Hull Electric Co.

15631, 15632. Dec. 18, 15.—Authorizing C.P.R. to build spurs for A. E. Burns, near Henry Ave., Winnipeg, and Rock Springs Sootless Coal Co., near Elcan ballast pit spur, Alta.

15634. Dec. 20.—Approving Esquimalt and Nanaimo Ry. location from Black Creek to near Duncan's Bay, Vancouver Island, B.C.

15635. Nov. 21.—Ordering that supplement to Canadian Classification 15 be issued reducing carload rating of marconi, spaghetti and vermicelli, from 4th to 5th class to become effective not later than Jan. 15, 1912, on application of Montreal Board of Trade Transportation Bureau.

15633. Dec. 16.—Authorizing C.N.O.R. to use for construction purposes only C.P.R. crossing at Chaudiere Jct., near Ottawa, until June 1, 1912, pending completion of interlocker.

15636, 15637. Dec. 13.—Ordering that Wabash Rd. and G.T.R. install gates at Manitoba St., St. Thomas, Ont., before May 1, 1912; also electric bell at St. George St., Chatham, Ont., before Feb. 1, 1912, 20% to be paid from railway grade crossing fund in each case.

15638. Dec. 16.—Extending to June 1, 1912, time for installation of interlocking plant at crossing of C.P.R. and G.T.R. by C.N.O.R., near Ottawa.

15639. Dec. 19.—Relieving C.N.R. from further protection at crossing east of switch at Dauphin, Man.

15640, 15641. Dec. 20.—Authorizing C.N.R. to build across public road and two highways on its Maryfield extension, Sask.

15642. Dec. 20.—Authorizing C.N.R. to cross and divert highway on its Rossburn line, Sask.

15643 to 15645. Dec. 20.—Approving revised location of C.N.O.R. Montreal-Port Arthur line through Ross tp., through unsurveyed territory in Algoma district, mileage 148 to 166 from Sudbury Jct., and through Loughborough tp.

15646 to 15649. Dec. 20.—Authorizing C.P.R. to build spurs for Carbon Oil Co., Rosser, Man.; city of Moose Jaw, Sask.; Continental Oil Co., Lethbridge, Alta., and Eley Bros., near Woods, Man.

15650. Dec. 21.—Amending order 15594 of Dec. 12, 1911, re Esquimalt and Nanaimo Ry. by striking out words "Canadian Pacific Railway Company."

15651, 15652. Dec. 20.—Authorizing T.H. and B.R. to operate two spurs into premises of Laidlaw Bale Tie Co., and Canadian Drawn Steel Co., Hamilton, Ont.

15653. Dec. 20.—Approving G.T.R. plans for new station at Exeter, Ont.

15654. Dec. 16.—Ordering that upon conveyance by Petrolea Waggon Co., Petrolea, Ont., of land necessary, an interchange track be built by G.T.R. or M.C.R., cost to be divided equally between companies.

15655. Dec. 20.—Authorizing city of Fort William, Ont., to widen Victoria Ave. by 14 ft. across C.N.R. at Vickers St.

15656. Dec. 20.—Ordering C.P.R. to submit plans for station at Dysart, Sask., by April 1, 1912.

15657. Dec. 13.—Authorizing British Columbia Electric Ry. to cross C.P.R. at foot of Twelfth St., New Westminster.

15658. Dec. 21.—Approving location of C.N.R. station at Veregin, Sask.

15659. Dec. 19.—Extending to Apr. 1, 1912 time for C.P.R. and C.N.R. to file freight tariffs to apply between Fort William, Port Arthur and points east thereof, and Regina, Moose Jaw and other western points, as required by order 12520, Dec. 10, 1910.

15660. Dec. 20.—Authorizing C.P.R. to build spur for T. Kinnear and Co., Peterboro, Ont.

15661. Dec. 22.—Ordering T.H. and B.R. to maintain light on electric bell at Mohawk Road crossing, Brantford, Ont., and then relieving company of speed limitations there.

15662. Dec. 21.—Relieving C.P.R. from further protection at crossing between Makaroff and Togo, Sask.

15663 to 15666. Dec. 21, 22.—Approving location of C.N.O.R. station grounds at Lombardy, Perth Road, Loughborough tp., Elgin and Bedford.

15667. Dec. 15.—Authorizing G.T.R. to build spur for St. Marys Portland Cement Co., and Horse Shoe Quarry, Blanchard tp., Ont.

15668. Dec. 21.—Extending to Jan. 31, 1912. time for G.T.R. to complete overhead bridge in lieu of subway at Queen St., Palmerston, Ont., as required by order 14164, June 24.

15669. Dec. 16.—Authorizing G.T.R. to build bridges at Mill, Peter, Barrett, and Ontario Sts., Port Hope, Ont.

15670. Dec. 16.—Ordering payment of taxed costs to W. H. Miles by G.T.R., re taking of lands at Etobicoke tp., Ont.

15671. Dec. 22.—Authorizing G.T.R. to build track on east side of Metcalf St., Simcoe, Ont.

15672. Dec. 22.—Amending order 14606, Aug. 21, 1911, par. 4, re interswitching at Brandon, Man., $2 a car to be revenue of Brandon, Saskatchewan and Hudson Bay Ry. on empties transferred between C.P.R. and C.N.R.

15673. Dec. 22.—Approving location of C.N.R. at Cushing, Que.

15674. Dec. 23.—Approving location of South Ontario Pacific Ry. (C.P.R.) station at Waterdown, Ont.

15675. Dec. 23.—Relieving G.T.R. from further protection of first crossing west of Port Robinson, Ont.

15676. Dec. 22.—Authorizing C.N.O.R. to cross and divert public road between cons. 1 and 2, South Elmsley tp.

15677. Dec. 23.—Approving location of C.N.O.R. through Chisholm and Ferris tps., mileage 325.23 to 343.55 from Montreal.

15678. Dec. 16.—Amending order 15151, Oct. 12, re erection of gates by G.T.R., at Royce Ave., Toronto, by providing that they be put outside C.P.R track, and that new plan be filed.

15679. Dec. 23.—Authorizing C.P.R. to cross highway at mileage 202.77 with its Moose Jaw Northwesterly branch, Sask.

15680. Dec. 26.—Authorizing C.P.R. to open for freight traffic its line from Coldwater to Bethany, mileage 12.2 to 88.2, Ont.

15681. Dec. 26.—Authorizing C.P.R. to rebuild bridge 127.2, Mountain subdivision, British Columbia Division.

15682. Dec. 26.—Authorizing C.P.R. to open for traffic its second track, Moose Jaw subdivision, from Moose Jaw to Pasqua, mileage 127.68 to 134.43, Sask.

15683. Dec. 23.—Recommending to Governor in Council for approval, G.T.R. Transportation Department rules.

15684. Dec. 26.—Extending to June 30, 1912, time for completion by Toronto Eastern Railway of spurs for Durham Rubber Co., Bowmanville, Ont.

15685. Dec. 23.—Ordering Central Vermont Ry. to ballast its entire line between St. Lambert and Waterloo, Marieville and St. Cesaire, Farnham and Frielsburg, and Iberville and Farnham, and to repair all bridges, farm and highway crossings, and fencings, ballast to be 6 ins. lift; work to be completed by Oct. 1, 1912, and that within 30 days from date of order, frogs and guard rails be filled, under penalty of $25 a day.

15686, 15687. Dec. 27.—Authorizing C.P.R. to rebuild bridge 127.2, Mountain subdivision, British Columbia Division, and 94.8, over Wascana Creek, Moose Jaw subdivision, Saskatchewan Division.

15688. Dec. 27.—Authorizing C.P.R. to build spur for Park Fuel and Lumber Co., Calgary, Alta.

15689 to 15691. Dec. 27, 23.—Approving location of C.N.O.R. through unsurveyed territory in Algoma District, mileage 287 to 327, from Sudbury Jct., and approving revised location through Alice, Fraser and Richards tps., mileage 209 to 225.42 from Montreal.

15692. Dec. 27.—Ordering C.P.R. to install improved type of electric bell at crossing of County Road, 1¼ miles east of Ivanhoe station, Ont., 20% to be paid from railway grade crossing fund.

15693. Dec. 27.—Authorizing C.N.R. to build spur to Ritchie Coal Co.'s yards, Edmonton, Alta.

15694. Dec. 27.—Authorizing C.P.R. and G.T.P. Branch Lines Co. to operate trains over crossing in n.w. ¼ sec. 32, tp. 17, r. 19, w. 2 m., Sask., pending installation of interlocker required by order 13663, May 16.

15695. Dec. 28.—Recommending to Governor-in-Council for sanction, lease between C.P.R. and Dominion Atlantic Ry.

15696. Dec. 27.—Authorizing C.P.R. to open for traffic portion of its Weyburn-Lethbridge line from Ogema to Viceroy, mileage 52.2 to 75.85.

15697. Dec. 28.—Authorizing Esquimalt and Nanaimo Ry. to use bridges at mileage 14.0, 54.4, 131.7 and 132.3.

15698. Dec. 26.—Relieving C.P.R. from further protection of crossing at mileage 45.1 from Place Viger station, Montreal.

15699. Dec. 29.—Approving revised location of C.P.R. Swift Current-Brooks branch, mileage 0 to 35.32, Sask.

15700. Dec. 28.—Authorizing C.P.R. to build its Wilkie Northwesterly branch across highway at mileage 7.64, Sask.

15701, 15702. Dec. 29.—Authorizing C.N.O.R. to cross three highways in Trafalgar and Nelson tps.

15703. Dec. 27.—Authorizing C.N.R. to build spur north of 17th St., Saskatoon, Sask.

15704. Dec. 28.—Authorizing G.T.R. to operate trains, without stopping, through Alford Jct., Ont.

15705. Dec. 28.—Authorizing G.T.R. to build spur for National Brick Co., St. Constant, Que.

15706. Dec. 28.—Approving certain alterations in G.T.P.R. revised location in North Alberta District.

15707. Dec. 28.—Authorizing C.N.O.R. to cross seven highways in Nelson and Trafalgar tps.

15708. Dec. 28.—Approving location of C.P.R. Wilkie-Anglia branch, mileage 24.90 to 40.66, and to cross and divert 14 highways, mileage 25.55 to 40.66, Sask.

15709. Dec. 29.—Authorizing C.P.R. to build two spurs for Imperial Oil Co., near Alexander Ave., Winnipeg.

15710. Dec. 29.—Authorizing C.N.O.R. to cross three highways in Nelson tp.

15711. Dec. 30.—Authorizing C.P.R. to rebuild bridge 15.3 over Isaac Creek, Arrow Lake subdivision, B.C., and rescinding order 15681, Dec. 26, which authorized rebuilding of bridge 127.2, Mountain subdivision, B.C.

15712. Dec. 29.—Authorizing C.P.R. to cross with its Estevan-Forward branch 39 highways in Saskatchewan.

15713, 15714. Dec. 30.—Approving C.N.O.R. revised location near Nipigon, mileage 497.16 to 498 from Sudbury Jct., and to cross eight highways in Toronto tp.

15715. Dec. 19.—Authorizing G.T.R. to take certain lands in Kingston, Ont., for enlarged facilities.

15716. Dec. 27.—Suspending G.T.P.R. local and joint passenger tariff C.R.C. 129, relating to baggage of excess size, until all parties can be heard.

15717. Dec. 19.—Approving C.P.R. grade revision between St. Martins Jct. and Ste. Therese, and authorizing it to build double track across six highways.

15718. Dec. 15.—Amending order 7112, May 18, 1909, which authorized M.C.R. to cross with two additional tracks, Sandwich St., Windsor, Ont., and approving temporary bridge, by substituting another plan and providing that new bridge be built during 1912.

15719. Jan. 2.—Appointing W. M. Tisdale, attorney at law, Redlands, Cal., and J. P. Hartman, attorney at law, Seattle, Wash., as commissioners for examination of witnesses in rate case of Dawson Board of Trade vs. White Pass and Yukon Route.

15720. Nov. 27.—Dismissing application of J. Hoolahan, Ste. Agathe des Monts, Que., re C.P.R. rates on perishable goods.

15721. Dec. 30.—Authorizing G.T.P.R. to build transfer track to connect with C.N.R. at Portage la Prairie, Man.

15722. Jan. 2.—Authorizing Midland Ry. of Manitoba (C.N.R.) to operate C.N.R. and G.T.P.R. crossings in St. Boniface parish, Man., for construction purposes only until Mar. 10.

15723. Dec. 30.—Authorizing C.N.O.R. to build bridge over Rideau canal and river at Smiths Falls.

15724. Nov. 21.—Disallowing tariffs of G.T.R., C.P.R., C.N.O.R., C.N.Q.R., Quebec, Montreal and Southern Ry., Central Vermont Ry., Ottawa and New York Ry., Central Ontario Ry., Thousand Islands Ry., Lotbiniere and Megantic Ry., N.Y.C. and H.R. Rd. and Rutland Rd., increasing rates on hay and straw from Ontario and Quebec to eastern U.S. points.

15725. Dec. 16.—Ordering C.P.R. before May 1, 1912, to give S. Plunkett, Vaughan tp., Ont., as good grade over new crossing as over old one before track elevation.

15726. Jan. 3.—Extending to Feb. 15 time for filing tariffs by G.N.R. on fertilizer from Vancouver and New Westminster, for W. H. Haight, Pipers Siding, B.C.

15727. Dec. 19.—Ordering G.T.P.R. to build station on lot 882, and restraining it from locating station on lot 851, group 1, Cassiar district, B.C.

15728. Jan. 3.—Authorizing C.N.O.R. to cross public road between southeast and southwest parts of lot 15, con. 1, Toronto tp.

15729. Jan. 2.—Authorizing C.P.R. to build

spur for Shawinigan Water and Power Co., Notre Dame du Mont Carmel parish, Que.

15730. Jan. 2.—Dismissing G.T.P.R. application for approval of location of its Prince Rupert Westerly line, mileage 0.00 to 3.23, r. 5, Coast District, B.C.

15731, 15732. Jan. 3.—Ordering C.P.R. before May 1 to provide suitable farm crossing for J. Connelly, Macleod, Alta., and before June 1, to build cattle pass for J. Smith, Wolffton, Sask.

15733. Jan. 4.—Authorizing C.P.R. to operate siding to Union stock yards, Toronto.

15734. Jan. 3.—Amending order 15580, Dec. 11, 1911, by providing that cost of protection of crossing by T.H. and B. Ry. over G.T.R. and Hamilton Radial Ry., Hamilton, Ont., be paid one-third by G.T.R. and balance by T.H. and B.R.

15735. Jan. 2.—Ordering G.T.P.R. to remove sufficient rock fill at Cameron Bay, Prince Rupert, B.C., and to file with Board before Feb. 15, plan showing location of opening and depth of girders for carrying track, etc., re obstruction caused to navigation.

15736, 15737. Jan. 5.—Approving location of C.N.O.R. Montreal-Port Arthur line through Widdifield, Cimmanda, Beaucage, and Pedley tps., Nipissing District, mileage 346.37 to 366 from Montreal, and through Capreol tp., mileage 0 to 71.81 from Capreol Jct.

15738. Jan. 4.—Authorizing C.P.R. to build two spurs for Port Arthur Wagon Co., Port Arthur, Ont.

15739. Jan. 3.—Authorizing C.N.O.R. to build branch from Oshawa station to Oshawa, mileage 0 to 3.95, to connect with Toronto Eastern Ry.

15740 to 15742. Jan. 4, 3, 2.—Authorizing C.P.R. to build spurs for Strome Milling and Grain Co., Strome, Alta.; Swift Canadian Co., Winnipeg, Man., and E. Julian and Co., Quebec, Que.

15743. Jan. 4.—Authorizing C.P.R. to rebuild bridge 63.8, Brandon subdivision, Man.

15744. Jan. 3.—Relieving C.P.R. from further protection at crossing in Campbellville, Ont.

15745. Jan. 3.—Authorizing T.H. and B.R. to build spur for Armstrong Supply Co., Hamilton, Ont.

15746. Jan. 3.—Authorizing G.T.R. to build spur for Schell Bros. and Blow, North Cayuga tp., Ont.

15747. Jan. 3.—Relieving G.T.R. from further protection at crossing 1½ miles east of Glencoe. Ont.

15748. Jan. 4.—Authorizing C.N.O.R. to cross public road in Nelson tp.

15749. Jan. 3.—Authorizing city of Winnipeg to extend Ellice Ave. across C.P.R. Pembina branch.

15750. Jan. 3.—Approving location of South Ontario Pacific Ry. station at Progresston, mileage 5.32, East Flamboro tp.

15751. Dec. 14.—Ordering G.T.R. to employ watchman from May 1 to Oct. 1, each year at crossing just east of Grimsby Beach, Ont., 15% to be paid by Grimsby tp.

15752. Jan. 3.—Extending to June 1 time for G.T.R. to make changes to water standpipes at Alexandria, Ont.

15753. Jan. 11.—Approving G.N.R. plans for spur for W. H. Haight, Piper's Siding, B.C.

15754. Jan. 8.—General order re freight rates to Western Canada; this order is given in full on another page.

15755. Jan. 8.—Authorizing C.P.R. to build spur for Bardsley and Peterson in n.e. ¼ sec. 4, tp. 2, r. 7, w. 2 m.

15756. Jan. 8.—Authorizing G.T.R. to build spur for Lautz Co., Bridgeburg, Ont.

15757. Dec. 28.—Ordering Atlantic, Quebec and Western Ry. to provide joint farm crossing for A. Lelievre, Little River East, with that ordered by order 15456, Nov. 22. 1911, for A. Shannon.

15758. Jan. 8.—Authorizing C.N.O.R. to build from Central Ontario Ry. at Stanley St., Trenton, to a railway bridge across Trent River.

15759. Jan. 8.—Authorizing express collection and delivery limits for Strathcona, Alta.

15760. Jan. 4.—Authorizing C.P.R. to divert road allowance in Mara tp., Ont., mileage 41.56 from Port McNicoll.

15761, 15762. Jan. 4.—Authorizing C.N.O.R. to take lands, etc., of G. W. Burgess and J. Penny, in Belleville, Ont.

15763. Jan. 8.—Authorizing G.T.P. Branch Lines Co. to cross with its Melville,Regina line, public road at mile post 42, Lebret, Sask.

15764. Jan. 9.—Ordering that G.T.R. crossing over Yonge St., Simcoe, Ont., when watchman is not on duty, be protected by flagman for all switching movements.

15765. Jan. 5.—Ordering C.N.R. to erect by Feb. 15, under penalty of $10 a day, wind breaks, etc., just east of Melfort, Sask.

15766. Dec. 13.—Approving plans and location for G.T.R. new station at Stoney Point, Ont.

15767. Jan. 3.—Authorizing C.P.R. to cross with its Swift Current-Brooks branch, 23 highways in Saskatchewan.

15768. Jan. 11.—Authorizing C.P.R. to build sidings into Union Stock Yards. Toronto.

15769. Jan. 9.—Authorizing C.N.O.R. to open for traffic its line from Harrowsmith to Sydenham, mileage 160.50 to 163.50 from Don Jct.

15770. Jan. 11.—Authorizing Saskatchewan Government to divert highway and cross C.P.R. at Foam Lake, Sask.

15771. Jan. 9.—Authorizing G.T.P. Branch Lines Co. to cross with its Melville-Regina branch, and divert highways at mileage 85.9 to 58.9, Sask.

15772. Jan. 9.—Authorizing T.H. and B.R. to discontinue operation of its interlocking appliances at Hamilton St. Ry. crossing, Barton St. East, Hamilton, until May 1, crossing to be protected by flag during passage of trains.

15773. Jan. 11.—Authorizing C.P.R. to operate spur for Lowe Bros., Sorauren Ave., Toronto.

15774, 15775. Jan. 10.—Extending to Mar. 31 and May 31, respectively, time for completion by C.P.R. of subways at sec. 34, tp. 24, r. 2, w. 5 m., and at Jane St., West Toronto.

15776. Jan. 12. — Approving Lachine, Jacques Cartier and Maisonneuve Ry. location, 400 ft. west of C.P.R. crossing at Iberville St., to terminal at St. Catherine St., Montreal, through C.P.R. lands, subject to agreement between the two companies.

15777. Jan. 8.—Ordering C.P.R. before June 15, to provide interchange track with G.T.R. in Goderich, Ont.

15778. Jan. 9.—Authorizing express collection and delivery limits for Brighton, Ont.

15779. Jan. 10.—Ordering Canadian Ex. Co. to file tariff before Jan. 25, abolishing extra charge between Pictou, N.S., and Charlottetown, P.E.I., except when it be necessary, owing to weather conditions, for traffic to be carried to Georgetown, P.E.I.

15780. Jan. 4.—Directing C.P.R. not later than Feb. 10 to provide two passenger trains a day each way between Ottawa and Prescott, Ont.

15781. Jan. 8.—Authorizing C.N.R. to cross overhead with its Vegreville-Calgary branch, the C.P.R. Macleod branch in s.w. ¼ sec. 11, tp. 24, r. 1, w. 5 m., Alta.

15782. Jan. 9.—Authorizing N.Y.C. and H.R. Rd. to rebuild interlocking plant at G.T.R. crossing, Cecile Jct., Que.

15783, 15784. Jan. 8.—Correcting omissions and errors in G.T.P. Branch Lines Co.'s Regina-Boundary branch location.

15785. Jan. 10.—Authorizing C.P.R. to build its Wilkie-Anglia branch across 12 highways, mileage 0 to 19.37, Sask.

15786. Jan. 10.—Authorizing G.T.R. to build siding for International Varnish Co., and Pinchin, Johnson and Co., Toronto.

15787. Jan. 10.—Authorizing T.H. and B.R. to build five spurs for Verity Plow Co., Brantford, Ont.

15788. Jan. 12.—Authorizing C.N.R. to open for traffic its line from Grosse Isle, Man., to end of track, 31 miles, fencing, etc., to be completed by Aug. 1.

15789. Jan. 12.—Authorizing G.T.R. to rebuild bridge 39 at mileage 216.51, over Pike's Creek, District 18, Ont.

15790. Jan. 4.—Authorizing C.N.O.R. to take property of J. Britnell, Belleville, for diverting Bay St.

15791. Jan. 10.—Authorizing C.P.R. to rebuild bridge 43.8, Farnham subdivision, Montreal terminals.

15792. Jan. 13.—Authorizing British Columbia Government to build highway crossing over Columbia and Western Ry. at Eholt.

15793. Jan. 13.—Authorizing C.P.R to build spur for Standard Fish and Fertilizer Co., Calgary, Alta.

15794. Jan. 11.—Authorizing C.P.R. to build its Kerrobert Northeasterly branch across highways from mileage 1.52 to 19.16, Sask.

15795. Jan. 12.—Authorizing C.N.R. to use for construction purposes only, until July 1, its Deslisle extension crossing of C.P.R. Moose Jaw-Lacombe branch.

15796. Jan. 11.—Authorizing C.N.R. to build spur for Saskatoon Milling and Elevating Co., Saskatoon, Sask.

15797 to 15799. Jan. 15. — Approving C.N.O.R. Montreal-Port Arthur line location through unsurveyed territory, Algoma District, mileage 327 to 343.15, and from Sudbury Jct. and Montreal-Port Arthur line location through Nepean, March and Tarbolton tps., mileage 14.3 to 27, and through Ross, Westmeath and Pembroke tps., mileage 67 to 83.45 from Ottawa.

15800. Jan. 12.—Authorizing city of Toronto to maintain wires across C.P.R. and G.T.R. and G.N.W. Telegraph Co. and C.P.R. telegraph wires at Queen St., Toronto, and rescinding order 13817, May 31, 1911.

15801. Jan. 11.—Authorizing C.P.R. to build public crossing at mileage 70.06, Cartier subdivision, Ont.

15802. Jan. 11.—Authorizing Canadian Copper Co. to build spur across Algoma Eastern Ry. at grade, and C.P.R. overhead, interlocking semaphores to be installed.

15803. Jan. 15.—Relieving C.P.R. from erecting fences and cattle guards between Woodstock and Andover, N.B.

15804, 15805. Jan. 15, 16.—Correcting errors in location of G.T.P. Branch Lines Co.'s Biggar-Calgary and Regina-Moose Jaw branches.

15806. Dec. 21.—Ordering G.T.R. to install improved electric bell at Edward St., Prescott, Ont., 20% to be paid from railway grade crossing fund.

15807. Nov. 27.—Authorizing C.N.O.R. to connect with Montreal Terminal Ry. and C.N.Q.R. near Montreal.

15808. Jan. 17.—Amending order 15655, Dec. 20, 1911, which authorized city of Fort William, Ont., to widen Victoria Ave. across C.N.R. at Vickers St., by striking out, at Vickers St.

15809. Jan. 17.—Authorizing C.N.R. to build spur at Neepawa, Man.

15810. Jan. 4.—Dismissing application of Sanitaris, Ltd., Arnprior, Ont., re express classification on returned empties.

15811. Jan. 9.—Authorizing C.P.R. to take certain lands in Toronto, and build branch across G.T.R. and join tracks used jointly with G.T.R., also to cross Toronto Ry. at junction of Spadina Ave. and Front St., Toronto.

15812. Jan. 18.—Authorizing C.P.R. to build spur for Stone Fertilizer Co., North Oxford tp., Ont.

15813, 15814. Jan. 16, 18.—Approving plans of Gilbert drain along M.C.R. right of way, to be built by Southwold tp., Ont.; also plans and character of Chauvin drain, under G.T.R. in Tilbury North tp., Ont.

Canadian Ticket Agents' Association.

At a meeting of the executive committee in Toronto Jan. 18 it was decided to hold the next annual meeting at Ottawa, Oct. 8 and 9, with headquarters at the Chateau Laurier, and a trip will be made to Montreal.

J. A. McKenzie, outside ticket agent, G.T.R., Woodstock, Ont., and an ex-President of the Association, was appointed to represent the Association at the American Association of General Passenger and Ticket Agents annual meeting at Seattle, Wash., next autumn.

An invitation to send a representative to the American Association of Passenger Agents annual meeting was referred to a special committee to be dealt with when the place and date of meeting are announced.

J. F. Dolan, city ticket agent, R. and O.N. Co., Montreal, and ex-President of the Association, was elected a member of the executive committee, vice M. McNamara, deceased.

A resolution of sympathy in connection with the death of Mr. McNamara, ex-President, was adopted.

The Association's honorary counsel, J. H. Flock, K.C., of London, having given an opinion that the amendments to the constitution, including a change of the Association's name, which were adopted at the annual meeting at Sault Ste. Marie in Oct., 1911, weer ultra vires, it was decided not to act upon them.

C. E. McPherson, Assistant Passenger Traffic Manager, Western Lines, C.P.R., Winnipeg, dropped in during the meeting and was warmly welcomed.

What is said to be the longest and heaviest train ever operated, reported by Machinery, was recently run from Altoona to Enola, Pa., 127 miles. Its length was 4,888 ft.—nearly a mile—and it consisted of 120 steel gondola cars loaded with 6,450 tons of coal. It was pulled at the rate of 13 miles an hour by a single locomotive of the Pennsylvania H-6-B type. The locomotive was in communication with the caboose by telephone. The train was run as a test to determine the capacity of freight locomotives over the improved sections of the line where grades have been removed and curves compensated.

Railway Rolling Stock Notes.

The G.T.R. has ordered 250 refrigerator cars, 30 tons capacity, from the Canadian Car and Foundry Co., Montreal.

Mussens, Ltd., have ordered four steel underframe flat cars, 40 tons capacity, from the Canadian Car and Foundry Co., Montreal.

Cavicchi and Pegano, railway contractors, have ordered 16 dump cars, 30 tons capacity, from the Canadian Car and Foundry Co., Montreal.

The Dominion Equipment and Supply Co., Winnipeg, has ordered three Lidgerwood flat cars from the Canadian Car and Foundry Co., Montreal.

The Grand Trunk Pacific Ry. has ordered two complete sets of top ploughs from F. H. Hopkins and Co., Montreal, and two spreaders from the United States.

The Grand Trunk Pacific Ry. has received eight Pacific type locomotives, nos. 1101 to 1108, and four switching locomotives, nos. 402 to 405, from the Montreal Locomotive Works.

The Central Vermont Ry. is reported to have ordered four Pacific type locomotives from the Baldwin Locomotive Works, and three switching locomotives from the Lima Locomotive and Machine Co.

The G.T.P.R. has ordered 300 forty ton steel underframe Hart-convertible ballast and construction cars, for delivery in the spring, and three Rodger double plough distributing cars, from the Hart-Otis Car Co., Montreal.

The Charlottetown, P.E.I., Board of Trade passed a resolution, Jan. 10, urging the Dominion Government to build in the local shops, locomotives and other rolling stock required for the proposed re-construction of the P.E.I. Ry. to standard gauge.

The Grand Trunk Pacific Ry. has ordered 25 consolidation locomotives, with Schmidt superheaters, from the Montreal Locomotive Works, and 15 consolidation locomotives, with Schmidt superheaters, in addition to the 25, details of which we gave in our last issue, from the Canadian Locomotive Co.

The Canadian Northern Ry. between Dec. 15, 1911, and Jan. 15, received the following additions to rolling stock:—one first class car, five snow ploughs and 70 box cars, from the Canadian Car and Foundry Co.; 90 box cars from the Crossen Car Co.; one consolidation locomotive from the Canada Foundry Co., and 80 box cars from the Nova Scotia Car Works.

The Intercolonial Ry., since Dec. 19, 1911, has received the following additions to rolling stock:—18 box cars, 60,000 lbs. capacity, 85 steel frame box cars, 60,000 lbs. capacity, and 46 Hart-Otis steel dump cars, 100,000 lbs. capacity, from the Canadian Car and Foundry Co.; four switching and five Pacific type locomotives, from the Canadian Locomotive Co., and four box cars, 60,000 lbs. capacity.

The C.P.R., between Dec. 14, 1911, and Jan. 18, received the following additions to rolling stock:—two flangers, two snow ploughs, four vans, 10 baggage and express cars, one dining car, two G1, two G2 and four D4 locomotives from its Angus shops, Montreal; eight D4 locomotives from the Montreal Locomotive Works; 50 ballast cars from the Canadian Car and Foundry Co., Montreal, and one wrecking crane from the U.S.

The C.P.R., between Dec. 14, 1911, and Jan. 18, ordered the following rolling stock:—one flanger, 66 wooden box cars, five vans, two superintendents' business cars, 308 stock cars, 201 freight refrigerator cars, 10 P1 locomotives and 10 U3 switching locomotives, from its Angus shops, Montreal; 50 D10 locomotives from the Montreal Locomotive Works; 400 flat cars from the Canadian Car and Foundry Co., and 200 stone cars from the Nova Scotia Car Works.

The Mond Nickel Co. has ordered 12 Otis type, all steel short cars, 50 tons capacity, for its ore service, from the Hart-Otis Car Co., Montreal. Following are the chief dimensions:—

Length over end sills	21 ft. 9½ ins.
Length inside	19 ft. 1 in.
Width over all	9 ft. 11¼ ins.
Width inside	9 ft. 6 ins.
Height inside	4 ft. 6 ins.
Height from rail to top	8 ft. 10¾ ins.
Height from rail to floor	4 ft. 4¾ ins.
Truck centres	11 ft. 11 ins.
Wheel base of truck	5 ft. 4 ins.
Doors on each side	Four
Width of door opening	2 ft. 2 ins.
Length of door opening	19 ft. 1 in.

The G.T.R., for the three months ended Dec. 31, 1911, ordered the following rolling stock:—2,000 box cars from the Canadian Car and Foundry Co., and 44 passenger cars, 23 baggage cars, 1,000 box cars and 1,000 coal cars in the United States; and received the following additions to rolling stock:—six passenger cars and five baggage cars from its Point St. Charles shops, Montreal; one snow plough from its London, Ont., shops; 926 box cars from the Canadian Car and Foundry Co., and 10 freight locomotives from the American Locomotive Co. Details of these have been given in previous issues.

The Canadian Car and Foundry Co., Montreal, between Dec. 15, 1911, and Jan. 15, made the following shipments of rolling stock:—two first class passenger cars, two sleeping cars, five snow ploughs, 118 box cars and five steel underframe flat cars. for the Canadian Northern Ry.; one 40-ton steel frame drop bottom box car and 48 fifty-ton steel frame box cars, for the Canadian Pacific Ry.; 46 fifty-ton Otis dump cars and 108 thirty-ton steel frame box cars for the Intercolonial Ry.; 252 thirty-ton steel frame box cars for the Grand Trunk Ry.; one tourist car for the Grand Trunk Pacific Ry., and two pay-as-you-enter composite passenger cars for the Montreal St. Ry.

Following are chief details of the rotary snow plough which the Canadian Northern Ry. is having built by the Montreal Locomotive Works,—

Cylinders, diar. and stroke	17 by 22 ins.
Truck wheels, diar.	33 ins.
Boiler, diar.	60 ins.
Boiler pressure	190 lbs.
Firebox, length and width	92 by 50 ins.
Tubes, no. and diar.	202 2 ins.
Tubes, length	9 ft. 8 ins.
Heating surface, tubes	1,022 sq. ft.
Heating surface, firebox	130 sq. ft.
Heating surface, total	1,152 sq. ft.
Grate area	31.9 sq. ft.
Drum width	10 ft.
Cut width	10 ft. 7 ins.
Rotary wheel, diar.	9 ft. 8½ ins.
Length over all	38 ft. 3 ins.
Height, extreme	15 ft.
Weight on forward truck	82,000 lbs.
Weight on rear truck	70,000 lbs.
Weight, total	152.000 lbs.
Tender capacity, water	5,000 imp. gals.
Tender capacity, coal	10 tons

It was reported in Chicago recently that several of the steam railways terminating there were about to install Edison storage battery cars for suburban service. Among those mentioned were the Illinois Central Rd. and the Chicago Great Western Rd. Inquiry at the offices of these companies elicited a statement that the companies had not placed any orders for these cars, but were considering the question carefully, and that the limited clearances for overhead construction and for third rails made the freedom from these factors an important merit of storage battery cars.

Grand Trunk Railway Construction, Betterments, Etc.

New England Plans.—Application was made to the General Court of Massachusetts, Jan. 13, for authority to build a railway into Worcester and Boston, and to operate steamships within the Commonwealth's jurisdiction. One of the routes by which entrance is desired into Boston is from Blackstone on the Southern New England Ry., which is to be built into Providence, R.I., and a second is from Bellowes Falls on the Central Vermont Ry., while entrance is sought into Worcester by a branch from Douglas on the Southern New England Ry. The application is made by the Southern New England Ry., a subsidiary of the Central Vermont Ry., which is controlled by the G.T.R.

The board of aldermen of Providence, R.I., passed an ordinance, Dec. 29, authorizing the laying of track to the water front of that city by the Southern New England Ry.

Central Vermont Ry.—The Board of Railway Commissioners has ordered the company to ballast its entire line between St. Lambert and Waterloo, Que.; Marieville and St. Cesaire, Que.; Farnham and Frielsburg, Que.; Iberville and Farnham, Que.; and to repair all bridges, farm crossings, highway crossings, and fencing; the ballast to be six inches lift, the entire work to be completed by Oct. 1.

Kingston, Ont.—Application has been made to the Kingston, Ont., city council for the supply of 1,000 h.p. to operate drills and crushing machinery at a granite quarry in the vicinity of the city. The granite, it is stated, is to be used for the ballasting of the main line, in place of gravel. The matter was considered by the city council Jan. 8, and steps are being taken to provide the power, which is wanted in April.

Orillia, Ont.—A press report states that a site has been purchased in Orillia, Ont., on which to erect an office building. It is further stated that a new station will be built opposite the C.P.R. station on Mississaga St., and that a loop line is to be built to connect Orillia with Washago,, round the west side of Lake Couchiching.

Canada Atlantic Ry.—The company is arranging, according to press reports, to carry out an extensive programme of improvements on the C.A. Ry. through the Algonquin Park. The Highland Inn, it is stated, will have a 40 room addition built to it in time for next summer's tourist traffic. (Jan., pg. 20.)

Kingston and Pembroke Ry. Management.—A Kingston, Ont., dispatch of Jan. 24 says:—"Sir Thos. Shaughnessy has made the announcement that the C.P.R. intends shortly to take over the Kingston and Pembroke Ry., and make extensive improvements."

The C.P.R. is reported to be arranging to lay out and operate an experimental farm in New Brunswick.

The Dominion Government has refused to advise the disallowance of the Alberta Legislature's act cancelling Alberta and Great Waterways Ry. Co.'s franchise and the contract between the Alberta Government and the company for its construction.

The C.P.R. will run a farm special over its eastern lines during the summer, starting in Ontario in March, passing through Quebec, and completing the service in New Brunswick. The train will consist of three exhibit cars for agricultural products, three lecture cars and a staff of lecturers provided by the various provincial agricultural departments. The whole will be in charge of H. P. Timmerman, Industrial Commissioner, C.P.R.

Electric Railway Department

British Columbia Electric Railway Company's Locomotives

The B.C. Electric Ry. Co. has recently added two more electric locomotives to its rolling stock.

They were designed for operation on 600 volts direct current. They are of the double-truck, central-cab type and are required to haul cars around curves of 75 ft. radius and to traverse curves of 34 ft. radius when running alone. The trucks have equalized pedestals, square frames forged in one piece, half-elliptic springs and cast-steel rigid bolsters. The bolsters are cast in one piece with the brake lever fulcrums and side bearings, and are provided with suitable lugs on which part of the weight of the motors is distributed.

The frame is composed of four 12-in. channel longitudinal sills with cast-iron bumpers. Diagonal braces, 1¼ by 9 in., reinforce the frame between the middle and outside sills. The frame bolsters are made of 1¾ by 15 in. plates, and the transverse cover plates are ⅞ by 15 in. The bumpers have lugs to which the longitudinal sills are riveted and are cast in one piece with the coupler pockets and poling sockets. The cab is built of steel plate and can be entered from either end. Brakes are provided on all wheels, and are both hand and pneumatically operated. The equipment includes sand-boxes, pilots and automatic couplers at each end; also a bell and whistle. The couplers are so arranged that, if desired, extension drawbars may be used.

The principal dimensions are as follows:—

Wheelbase, rigid	6 ft. 8 in.
Wheelbase, total	22 ft. 2 in.
Distance between truck centres	15 ft. 6 in.
Distance between coupler knuckles	31 ft. 1 in.
Driving wheels, diameter, outside	36 in.
Driving wheels, diameter, centres	30 in.
Journals	5 ft. 6 in.
Width	9 ft. 6 in.
Height	12 ft.
Weight	90,000 lb.

Each locomotive carries four motors, one motor geared to each axle with a ratio of 17:60. The weight of the motors is carried by the two axle bearings and by a nose which rests directly on the truck transom. To facilitate repairs the wheels, axles and motors can be dropped into an overhauling pit, or one end of the cab can be jacked up, and a truck run out.

The motors are of the no. 307-D interpole type. The box type frame is of steel cast in one piece and is so constructed that the armature and bearing housings can be easily removed. The brush holders are also readily accessible. The field frame contains four interpole coils and four main field coils wound with flat copper strap, which is insulated with asbestos tape and impregnated with an insulating, heat-conducting and waterproof compound. This insulation will not be injured if a temperature of 100 deg. C. is sometimes reached in service. The motors operate efficiently on potentials ranging from 300 to 600 volts. The normal rating of the motor is 150 h.p. at 500 volts and 260 amp. with blowers. The approximate continuous rating, with blowers, is 175 amp. at 300 volts. The weight of each motor, including gears, gear cases, pinions and axle bearings, is 5,510 lbs.

The current for the H.B. (hand-operated) unit switch control is obtained from a low-voltage storage battery, eliminating all heavy current-carrying parts in the controller. This control apparatus is small, light and extremely simple. Powerful forces are used to operate the switches and reverser, thereby providing great momentary overload capacity. An exceptionally powerful magnetic blowout is employed to insure long life to the contact tips and other wearing parts. The use of an independent control circuit enables the motorman to throw the reverser in case of emergencies or in case the power should go off the line.

The simple operation of the type H.B.

End View of Electric Locomotive.

control makes it very easy for the locomotive motorman to lean from the cab window and watch for signals while manipulating his controller. Many of the heavier K or L types of controller require practically all of a motorman's strength to operate. Another advantage of type H.B. control over the K. and L. types is that it is impossible for the motorman to stop between notches and draw an arc. He must advance his control handle a whole notch with every forward movement. Another important feature of the type H.B. control is its ability to control locomotives in multiple or "double-heading" when handling heavy traffic.

The control equipment consists of the following apparatus:—Two no. 264 line switches, two no. 264 switch groups, two no. 1764 reversers, two no. 133 master controllers, one no. 351 control cut-out switches, two no. 430 junction boxes, four no. 448 train line receptacles, two no. 449 train line jumpers, one set grid resistances, one set pneumatic details.

The motors are connected in series and in parallel in conjunction with the necessary resistance. This provides three running positions, namely: four motors in series, two motors in series two motors in parallel, and four motors in parallel. There are seven resistance steps with the motors connected in series, six with the motors in series parallel and five with all motors in parallel. Reversing is accomplished by means of two pneumatically-operated reversers, each reverser operating two motors. The control combinations are effected by two pneumatically-operated unit switch control groups. A master controller of the locomotive type is located in each end of the cab.

The brake equipment is the Westinghouse E.L. type, which provides for automatic operation of the locomotive and train brakes. Air for the brakes control system is furnished by a no. C-60 motor-driven compressor, which has a delivery capacity of approximately 50 cu. ft. of free air per minute. Each locomotive has a motor-driven centrifugal blower set which furnishes forced ventilation to the motors.

The motors and auxiliary apparatus have sufficient capacity to enable the locomotive to exert continuously a tractive effort of 6,800 lbs. with forced ventilation. Without forced ventilation the continuous tractive effort is 3,500 lbs. The locomotive is also able to exert a maximum tractive effort of 12,800 lbs. at approximately 17.5 m.p.h. for one hour. With clean dry rails the maximum tractive effort is 20,000 lbs. at 500 volts, at all speeds up to 15 m.p.h. With sand a momentary tractive effort of 26,000 lbs. can be exerted.

The hauling capacity of the locomotive is as follows:—

British Columbia Electric Railway Locomotive.

Number of Cars Each Weighing 45 Tons with Load at 17.5 m.p.h. at 550 Volts.

Straight.	*Maximum Grade.		
Level road	½%	1%	2%
39 cars	15 cars	9 cars	5 cars

*On fairly level and straight road the load to be handled is determined by the maximum grade.

The figures given for "straight, level

track" show the load which may be handled in switching service. The foregoing values given under maximum grade are safe when the grade requires a pull of but five minutes or ten minutes duration. In any particular case the number of cars that can be handled may be greater or less than the values above tabulated, depending upon the profile, curves and operating conditions.

The Baldwin Locomotive Works, Philadelphia, Pa., built the cab, trucks and all mechanical parts, the Westinghouse Electric and Manufacturing Co. built and installed the electrical equipment, including motors and control.

The Canadian Street Railway Association

By James Anderson, President.

At the dawn of a new year, it might not be amiss for me to give a short retrospect of the past few months from an electric railway point of view.

The past year has been an unusually busy one for the company with which I am identified (the Sandwich, Windsor and Amherstburg Ry.) and also for a great many of the other companies composing the Canadian Street Railway Association. This association was organized about eight years ago and has nearly every system in the Dominion, with the exception of municipally owned lines, represented on its membership roll. About 90% of the mileage in Canada is included in the association, the annual meetings of which are held during the early part of June. There are about 20 member companies. They are separated by the width of the Dominion, and include Halifax and St. John on the east and Vancouver on the west. Yet at the meeting in Windsor, Ont., last June, all parts of the Dominion were represented and those present took a keen interest in the discussion of the papers and practical talks that were given on that occasion. There is no doubt of the good service which the association is doing among its members, or of the valuable information that the small corporations can get from the experts in the different departments of the larger companies by meeting together. In fact, the opportunity of hearing and discussing the papers presented at our meetings is one which should not be missed by any Canadian electric railway official.

It has been my pleasure and privilege to attend several meetings of the Central Electric Railway Association and I believe that this association has done more to bring about uniformity and standardization of electric railways in Ohio, Indiana and adjoining States than any other influence that exists. It is by keeping in close touch with the other fellow that we are able to keep in the front rank ourselves.

Our association is working along the same lines, desiring to get uniformity in the operating rules which were approved by our association last July and have been submitted to the Board of Railway Commissioners for approval. The classification of accounts used by most of the systems in Canada is that of the American Association.

Our policy is to assist in solving the problems of the different companies and to give them the best advice that we can from the association of practical men in the different departments. Some of us do not have the same opportunities as others of going around and seeing what is done in communities larger than our own. If we did perhaps we should, like myself, sometimes feel ashamed of our home conditions. The public is not always to blame for its severe criticism of us; in fact, I am inclined to think we are often let down too easily.

In conclusion, let me say to the members of the Canadian electric railway fraternity that, although we have not as yet decided where we shall hold our next annual meeting, I trust that wherever it may be you will attend with all the representatives that your company can afford or spare from the service.

Edmonton Radial Railway.

The city of Edmonton, Alta., which owns and operates the Edmonton Radial Ry., is adding 15 double truck, double end, pay-as-you-enter cars to its equipment. Following are the principal particulars:—

Length of car body	30 ft. 6 ins.
Length overall, approximately	45 ft.
Width overall	8 ft. 10 ins.
Width over side sheathing, approximately	8 ft. 6 ins.

They will have a seating capacity of 36 passengers. The framing will be steel. The steps and doors will be folding and operated together by the one handle. The interior finish will be cherry, and the ceiling three-ply veneer bird's eye maple. The trucks will be 27G1 and they will have rolled steel wheels and Westinghouse air brakes. There will be two longitudinal seats at each end, each 5¼ ft. long and five pairs of reversible cross seats each 3 ft. long. Twill weave rattan will be used for the seats.

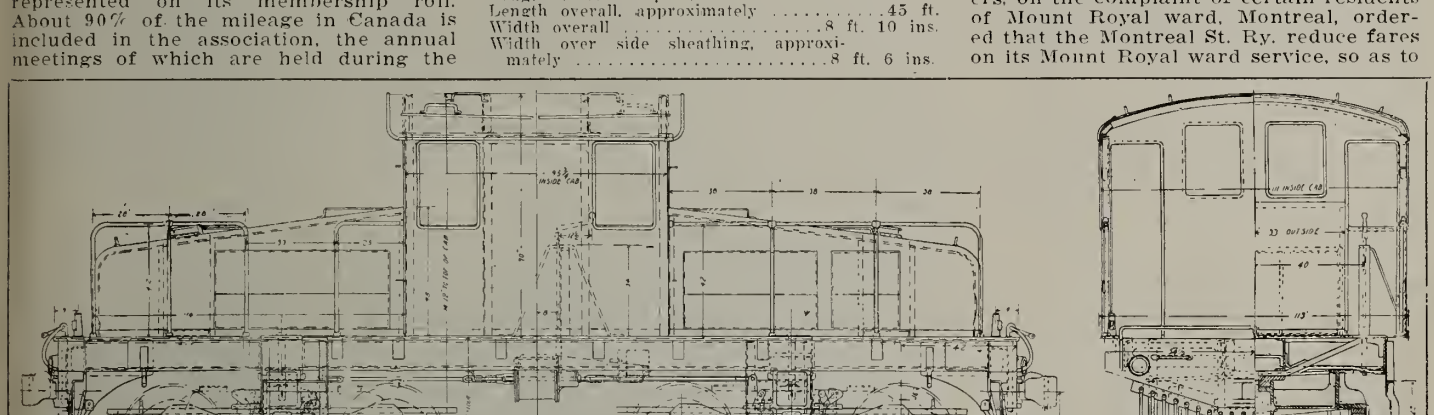
The car barn to be built will be of brick and concrete, with a capacity of approximately 100 cars, and will have a repair shops and offices. The extreme length of the entire building is approximately 558 ft., extreme width 225 ft. The main storage will contain 12 tracks each 300 ft. long. In the rear of this will be a transfer table, without pits, working across the full width of the building. Beyond this will come the repair section, 120 ft. long, a part of which will also be used for storage. In the rear and to one side of the repair pits will be located the various shops. The barn will be heated from a central plant by hot air. It is proposed to locate a power sub-station at the barn which will have an ultimate capacity of approximately 1,600 k.w.

In 1911 the number of passengers carried was 660,768 and the revenue $27,382.74, an average per passenger of 4.13 cents. In Dec., 1910, the passengers carried numbered 381,922 and the receipts were $15,982.34. The Edmonton Capital says:—"Figuring the cost of carrying each passenger at the cost for Nov., the system will show a deficit for Dec. of $4,625.37. In Nov. the deficit was $3,672.40. However, the proportion of cost per passenger will be less, providing power charges are the same as the month previous, for the reason that the operation expenses will be no greater, overhead will remain fixed, likewise capital charges. Consequently, the average loss per passenger might reasonably be expected to be less than 7 mills, the loss for Nov. It has been a fact that in the past the more passengers are carried the greater the loss has been. In short, the traffic has constantly been becoming heavier and the deficit greater."

Jurisdiction Over Montreal Street Railway

The city of Montreal has lost its appeal to the British Privy Council against the Montreal St. Ry. The case involved the question of whether the Board of Railway Commissioners had jurisdiction over provincial railway companies or companies operating under provincial charter connected with lines operating under Dominion charter. About a year ago the Board of Railway Commissioners, on the complaint of certain residents of Mount Royal ward, Montreal, ordered that the Montreal St. Ry. reduce fares on its Mount Royal ward service, so as to afford people in that district transportation at the same rate as that enjoyed by the residents of Notre Dame de Grace.

The Montreal St. Ry. contended that the Board of Railway Commissioners had no right to give such an order, and claimed that it could only be controlled by the Provincial Government, which granted its charter. The Supreme Court of Canada upheld the Montreal St. Ry.'s contention, Sir Louis Davies and Judge Anglin dissenting. The city of Montreal obtained leave from the Privy Council to appeal from the Supreme Court's judgment, and it is this appeal which has been dismissed.



British Columbia Electric Railway Locomotives. Side and End Elevations.

Levis County Railway Company's Annual Report.

The receipts for the year ended June 30, 1911, were $66,656.98; expenses, $57,755.03; net earnings, $8,901.95. The interest on bonds and loans for the year was $12,728.48, leaving a profit and loss debit of $3,826.53, which, added to $28,386.58 as the debit account, June 30, 1910, leaves a total profit and loss debit balance of $32,213.11.

Following are the directors and officers elected for the current year:—President, S. H. Ewing; Vice President, Hon. R. Turner; Secretary-Treasurer, E. A. Macnutt; other directors, J. A. Richardson, J. Forman, Col. C. E. Allen-Jones, J. C. Blouin.

C. E. A. Carr's Removal from Quebec.

C. E. A. Carr, who since Jan., 1910, has been General Manager of the Quebec Railway, Light, Heat and Power Co., has resigned on being appointed General Manager of the New Orleans, Southern and Grand Isle Ry. and of the Algiers Ry. and Lighting Co., at New Orleans, La.

On Jan. 8, he was presented by the staff, with a gold watch and fob, and a silver purse for Mrs. Carr, and they both left Quebec on the following day for New Orleans.

Mr. Carr's move is from one extreme climate to another, and it is a peculiar coincidence that Quebec and New Orleans are the oldest cities on the continent.

The New Orleans Southern and Grand Isle Ry. runs from Algiers, La., which is situated on the south side of the Mississippi River, opposite New Orleans, practically paralleling the river down stream to Buras, 59.6 miles. It is contemplated to build a line from Myrtle Grove, about 25 miles south of New Orleans, to Grand Isle on the Gulf of Mexico, where a harbor will be established. It is standard gauge and its equipment consists of eight locomotives, 10 passenger cars and 139 freight and miscellaneous cars. The President is C. D. Warren, Toronto, formerly President of the Lake Superior Corporation, and at one time largely interested in the Metropolitan Ry., now a portion of the Toronto and York Radial Ry. system.

The Algiers Ry. and Power Co. has six miles of electric railway in Algiers and furnishes power for lighting. It is probable that this company will be amalgamated with the New Orleans, Southern and Grand Isle Ry. Co. in the near future.

British Columbia Electric Railway Power Plant Extension.

Contracts have been let for the hydraulic and electrical equipment for the extension of the generating plant on the north arm of Burrard Inlet. The plans represent an expenditure of approximately $1,000,000. The installation is to be completed this year. The present output at the north arm plant is 43,500 h.p., which includes one unit of 10,500 h.p. which was placed in operation on Jan. 8. There is also a steam auxiliary plant in Vancouver of 12,000 h.p., one unit of 3,000 h.p. at this station having been put into service during the latter part of December.

The plans for the development at the north arm call for an additional installation of 42,000 h.p. This will give the company an available output of 85,500 h.p. from this station, which means the creation of a power station giving three times the amount of power furnished from any other similar plant in Western Canada.

The company has also recently awarded contracts for the development of its steam auxiliary, making the plant available for an output of 20,000 h.p., and this work will be completed early this year. The combined power at the hydro electric and steam plant which the company will have available at the close of 1912 will be 105,500 h.p., or over 1 h.p. for every two persons within the area of greater Vancouver, the city which is the centre of the company's operations on the mainand. As the company's territory on the mainland is, roughly, 20 by 80 miles, provision will be made for 66 h.p. per square mile over the entire district. Plans are now in hand for the development of other power sites which will bring its total output up to 200,000 horse power.

The development of the north arm plant will be carried on in connection with the construction of the dam at the mouth of Lake Coquitlam, 90 ft. high. This will give a storage capacity in Lake Coquitlam of 9,000 million cubic feet. During December the company completed the enlargement of the hydraulic tunnel connecting Lake Coquitlam and Lake Buntzen, from which latter point the north arm generating plant is fed at a head of 400 ft. This tunnel was originally 9 by 9 ft., but has been increased to 190 sq. ft. on section.

The new equipment at the north arm station, for which contracts have been awarded, will consist of three units, each of 14,000 h.p. The John McDougall Caledonian Iron Works of Montreal will supply the 14,000 h.p. waterwheels, which will be of the Doble type. They will be the largest units of this kind in America. The electrical equipment will consist of three generators, each of 9,000 k.v.a. capacity, and capable of overload to the maximum of the hydraulic equipment. The three new units will be housed in an independent generating station, located on the north arm waterfront, about 2,000 ft. south of the existing generating station. To convey the water from Lake Buntzen to the station a hydraulic tunnel will be driven through solid granite. It will be 2,250 ft. long, with an internal diameter of 15½ ft., and will be concrete lined throughout to lower the friction factor to the lowest possible point.

Electric Railway Track Laid in 1911.

Below is a table showing track laid on electric railways in Canada during 1911. The table is not published as a complete one, owing to the fact that some of the companies have not replied to the circular sent, but it is believed to be approximately correct. The noteworthy feature is the extensive construction of electric lines in Saskatchewan and Alberta, which promises to be even larger this year than in 1911.

	Miles.
BRITISH COLUMBIA ELECTRIC RY.—	
Various extensions in Vancouver, New Westminster and Victoria	29.00
CALGARY MUNICIPAL RY.—	
Various lines	24.50
GUELPH RADIAL RY.—	
Centre of city easterly for	1.25
LEWIS COUNTY RY.—	
Extension in upper town	0.66
MONCTON TRAMWAYS, ELECTRICITY & GAS CO.—	
King St. to John St.	2.00
MONTREAL AND SOUTHERN COUNTIES RY.—	
St. Lambert to Country Club	1.25
MONTREAL PARK AND ISLAND RY.—	
Two extensions	0.82
MONTREAL ST. RY.—	
Two extensions	0.66
MONTREAL TERMINAL RY.—	
One extension	0.12
MOOSE JAW ELECTRIC RY.—	
Various lines	8.35
QUEBEC RY., LIGHT AND POWER CO.—	
Beauport to Kent House Park	3.58
REGINA MUNICIPAL RY.—	
Various lines	10.50
SHERBROOKE RY. AND POWER CO.—	
Extensions on two lines	2.14
TORONTO RY.—	
Extensions and additions (estimated)	7.00
WINNIPEG ELECTRIC RY.—	
Eight extensions	10.75
Total	102.58

Cape Breton Electric Co.'s Earnings.

Following are the figures for the year ended Sept. 30, 1911:—

		Increase.
Gross earnings	$333.471.47	$15 738.40
Operating expenses	172,401.82	1,479.76
Net earnings	$161,069.65	$14,258.64
Interest charges and taxes	60,108.32	* 163.44
Balance	$100,961.33	$14,422.08
Sinking and Imp. funds	13,685.00	*15.00
Balance	$ 87,276.33	$14,437.08

*Decrease.

Construction charges since Jan. 1, 1911 ..... $41,805.51

Hamilton District Electric Railways.

Hamilton, Ont., press reports concerning electric railways state that negotiations are in progress for the taking over of the Dominion Power and Transmission Co.'s railways and other properties, and for their amalgamation with the extensive electric railway projects which are controlled by Mackenzie, Mann and Co. The report is denied by the Dominion Power and Transmission Co., but is persisted in, and it is further stated that involved in the whole is the provision of an entrance into Hamilton for the Canadian Northern Ontario Ry. line from Toronto to Buffalo. The Mayor of Hamilton stated recently that he had received a request from the C.N.O. Ry. authorities to defer action on the granting of an extension of line for the building of the Hamilton, Waterloo and Guelph Ry., which J. Patterson is projecting. The Toronto Suburban Ry., a Mackenzie, Mann and Co. line, has power to build a line covering practically the same route as the H.W. and G. Ry., and the report says that in order to secure the right of way at Dundurn Park granted the H.W. and G. Ry., the M., M. and Co. interests will acquire that charter also. The whole situation at present seems very much involved, owing to the various denials, as well as to the activities of officials and agents of M., M. and Co. interests in Hamilton and vicinity.

In an interview at Toronto, Jan. 17, on his return from Europe, Sir Wm. Mackenzie said he was in the market for the D.P. and T. Co., provided the price was right, but that he considered the company had a most excellent opinion of its own value.

Calgary Municipal Railway Earnings.

Following is a comparative statement of revenue, operating expenses and other statistics for 1911 and 1910:—

	1911.	1910.
REVENUE.		
Passenger earnings	$37,956.15	$21,499.80
Miscellaneous earnings	472.85	855.66
	$38,429.00	$22,355.46
OPERATING EXPENSES.		
Maintenance of way and structures	$ 1,031.70	$ 369.08
Maintenance of equipment and cars	3,775.51	1,114.03
Transportation	17,916.26	9,980.18
General expenses	1,748.77	976.91
	$24,472.24	$12,240.20
Balance of revenue over expenses	13.956.76	9,915.26
Contingent account, 5% of gross receipts	1,921.45	1,117.77
Interest and sinking fund	5,263.33	2,715.88
Net profits	6,771.98	6,081.61
	$38,429.00	$22,355.46
Revenue per car mile	28.382c.	35.617c.
Operating expenses per car mile	18.074c.	19.819c.
Gross profit per car mile	10.306c.	15.798c.
Cost of power per car mile	5.293c.	6.783c.
Proportion of operating expenses to revenue	63.6%	55.5%

The Toronto Ry., during 1911, paid to the city, as its percentage of earnings, mileage and taxes, $687,650.44, against $596,297.35 in 1910. The percentages of earnings paid to the city range from 8 to 20% on a sliding scale. Mileage is paid at the rate of $800 a single track mile.

Press reports state that the New York State Rys. Co. has increased its stock. This is believed to be a preliminary step in a plan to build a series of trolley lines across New York State. This company is owned by the New York Central Rd. Co. and has acquired a number of interurban lines in the state for the ultimate purpose of connecting these lines, completing a chain parallel to the New York Central.

Regina Municipal Railway.

Following are extracts from the report of H. Doughty, Superintendent, up to Oct. 31, 1911:

The construction of the Regina Municipal Ry. was started, April 20, 1911, partly by day labor and partly by contract, the work then authorized consisting of some 6½ miles of single track. About the beginning of August, contracts were placed for street pavements, and as street railway tracks had to be installed beforehand, it was deemed expedient to undertake the construction of an extra four miles of single track. This work was authorized on Aug. 7 and the whole layout of track decided upon for the year was installed complete and ready for operation by Nov., such consisting in bulk of 10½ miles single track, made up as follows:—21,000 ft. single track, 60 lbs. steel rails, gravel ballasted; 9,780 ft. single track, 80 lbs. steel rails, concreted and partly paved; and 25,500 ft. single track, or 12,750 ft. double track, 80 lbs. steel rails, concreted and paved, or a total of 57,280 single track complete with all track intersections and overhead construction from April 20 to Nov. 7 in 172 working days, making a daily average of 333 ft. single track. The cost of the above work is, approximately, as follows:—

60 lbs. single track ballasted, labor and material at $.49 per single foot.	$ 52,222.96
80 lbs. double track, concreted and paved, labor and material at $12.95 per double foot	165,108.26
80 lbs. single track, concreted and paved, labor and material at $5.40 per single foot	52,836.96
Track intersections, consisting of wyes, crossovers, turnouts, specials, etc., labor and material costing	101,648.24
Making a cost of all tracks installed complete at	$371,816.42

Basing the above figures per foot on the laying of track per mile complete with overhead construction, the same is as follows:—

60 lbs. steel rails, ballasted track, labor	
60 lbs. steel rails, ballasted track, labor and material per mile single track	$13,049.20
80 lbs. steel rails, concreted and paved track, labor and material per mile single track	28,512.00
80 lbs. steel rails, concreted and paved track, labor and material per mile double track	68,376.00

These prices compare most favorably with tracks of similar kinds laid in other cities.

On account of the Dominion Exhibition being held in Regina in the first and second weeks in August, it was decided that the tracks from the post office to the exhibition grounds be constructed and operated thereon. They were ready for operation on July 26. At that time the street railway unit was installed, but only four cars were in the city assembled ready to put into operation. On the evening of July 27, a trial run was made over the tracks as mentioned above, while on the following day, the railway was declared open and ready for operation by the Lieutenant Governor and the Mayor, the service afterwards for the day being given free to the public. During the two weeks of the exhibition, the railway earnings totalled $5,881.55, the passengers carried numbering 117,431. As the various parts of the system have been completed, they have been put into operation, and cars are now operating over all tracks laid.

The following figures give the results of operation from the commencement to Oct. 31, showing that it will in the immediate future be on a paying basis, fully taking care of operating expenses, besides providing for payment of interest and sinking fund on capital expenditure:—

Gross earnings	$14,065.78
Operating expenses	9,028.51
Net earnings over operating expenses.	$ 5,037.27

The railway up to the above date has been in operation 81 days, showing a daily net revenue over operating expenses of $62.19. The total number of passengers carried to that date was 277,428.

The rolling stock consists of four single truck cars, two double truck cars and one snow sweeper, entailing an expenditure of. approximately, $36,000. An additional six cars are being provided, but cannot be procured until early spring. An up-to-date car barn has been built sufficient for future requirements, capable of handling 25 cars. Machinery and all necessary equipment have been ordered; these, together with car barn tracks, building, etc., will cost about $40,000.

It is as yet impossible to determine the total amount of the year's expenditure on street railway work, but it will be, approximately, about $510,000.

Regina Municipal Railway. Cars and Car Crews.

T. P. Shonts, President of the Interborough Rapid Transit Co., which operates the elevated and subway lines in the boroughs of Manhattan and Bronx, New York City, has been elected President of the New York Railways Co., successor to the Metropolitan Street Ry. Co., which has been in the hands of a receiver for the past few years.

Electric Railway Finance, Meetings, Etc.

Berlin and Waterloo St. Ry.—The profit for 1911 on this line, which is operated by the town of Berlin, after providing for payment of interest, etc., on debentures, and general maintenance and improvements, was $4,500.

British Columbia Electric Ry.—Gross earnings for Nov., 1911, $488,699; working expenses, $302,489; net operating earnings, $186,210; renewal funds, $37,935; net earnings, $148,275; approximate income from investments, $25,000; net income, $173,275; against $355,292 gross earnings; $201,891, working expenses; $153,401, net operating earnings; $25,417, renewal funds; $127,984, net earnings; $20,000 approximate income from investments; $147,984, net income for Nov., 1910. Aggregate gross earnings for five months ended Nov. 30, 1911, $2,278,391; net earnings, $788,417; against $1,602,414, aggregate gross earnings; $670,628, net earnings for same period, 1910.

Calgary Municipal Ry.—The annual report of operations for the year 1911 shows:—Passenger earnings, $361,757.06; miscellaneous earnings, $7,112, a total of $368,869.06. Operating expenses, $191,654.58; net revenue, $177,214.48. After deducting debenture interest of $34,110; sinking fund, $18,159.99; taxes, $4,528.35, and bank interest, $5,604.50, there was a surplus of $114,869.06. This includes $3,784.70 of material purchased and in stock, and the balance has been appropriated as follows:—Contingent account, $16,426.50; grant in aid of taxes, $75,500; cash on hand and receivable, $19,100.44. The statistics showed:—Passengers carried, 8,838,057; transfer passengers, 864,736; average fare revenue, 4.081; passenger car mileage, 1,126,807; car earnings per car mile, 32.063; operating expenses per car mile, 17.008; cost of power per car mile, 5.180; proportion of operating expenses to revenue, 51.95%.

Edmonton Radial Ry.—Revenue for 1911, $239,258.61, an increase of 65.8% over that for 1910. The number of passengers carried was 5,748,157, an increase of 67.7%. There were increases in the cost of power, capital charges and track maintenance, amounting to $29,313.68, this being greater than the total deficit in 1910. The deficit for 1911 was $34,826.07.

Halifax Electric Tramway.—Railway receipts for Dec., 1911, $18,922.97, against $17,822.31 for Dec., 1910.

Hamilton, Grimsby and Beamsville Electric Ry.—The annual meeting was held at Hamilton, Ont., Jan. 22. Following are the officers and directors for the current year:—President, Jas. Dixon; Vice President, John Dickerson; Treasurer, John Knox; Secretary, G. D. Fearman.

Montreal and Southern Counties Ry.—Montreal press reports Jan. 22 state it is regarded as almost certain that the M. and S.C. Ry. will before very long be absorbed by the Montreal Tramways Co. The M. and S.C. Ry. is practically owned by the G.T.R.

Montreal St. Ry.—Passenger earnings for Dec., 1911, $425,164.02; miscellaneous earnings, $5,774.65; total earnings, $430,938.67; operating expenses, $268,328.54; net earnings, $162,610.13; city percentage on earnings, $20,621.23; interest on bonds and loans, $15,832.45; rental leased lines, $607.49; taxes, $5,000; total charges, $42,061.17; surplus, $120,548.96; expenses per cent. of earnings, 62.27, against $371,691.09 passenger earnings; $5,583.08 miscellaneous earnings; $377,274.17 total earnings: $235,209.36 operating expenses; $142,064.81 net earnings; $17,005.37 city percentage on earnings; $15,384.22 interest on bonds and loans; $552.50 rental leased lines; $4,700 taxes; $37,642.09 total

charges; $104,422.72 surplus; 62.34 expenses per cent. of earnings, for Dec., 1910. Aggregate total earnings for three months ended Dec. 31, 1911, $1,293,807.84; operating expenses, $761,106.50; net earnings, $532,701.34; total charges, $113,075.89; surplus, $419,625.45; expenses per cent. of earnings, 58.83, against $1,130,060.17 aggregate total earnings; $668,401.32 operating expenses; $461,658.85 net earnings; $101,653.23 total charges; $360,005.62 surplus; 59.15 expenses per cent. of earnings, for same period 1910.

Montreal Tramways Co.—A press report says that the plan of amalgamation of the Montreal Tramways Co. and the Canadian Light and Power Co. has been decided upon and that the amalgamation will be effected by a holding company taking up the common stock of the two companies to be absorbed. The holding company will be the Montreal Tramways and Power Co., with a London, Eng., charter and a capital of $20,000,000. The shareholders of the Montreal Tramways Co. and the Canadian Light and Power Co. will receive 1½ shares of Montreal Tramways and Power Co. for each share now held by the shareholders. The holders of $2,000,000 common stock of the Tramways Co. will receive $3,000,000 of the consolidated company stock and the holders of the outstanding $6,000,000 of Canadian Light and Power stock will receive $9,000,000 of the consolidated company's stock. The Montreal Tramways and Power Co.'s outstanding capital will, therefore, be $12,000,000 of the $20,000,000 authorized.

Ottawa Electric Ry.—A bonus of 3%, in addition to the usual 2% bonus and 10% dividend, making a total of 15%, was paid to shareholders, Jan. 16, in respect of the past year's operations.

Winnipeg Electric Ry.—Gross earnings for Nov., 1911, $355,825; working expenses, $181,446; net earnings, $174,379, against $341,560, gross earnings; $171,539, working expenses; $170,021, net earnings for Nov., 1910. Aggregate gross earnings for 11 months ended Nov. 30, 1911, $3,509,848; net earnings, $1,778,002, against $2,944,059, aggregate gross earnings; $1,466,980, net earnings for same period, 1910.

Electric Railway Notes.

The Toronto Suburban Ry. has ordered two double truck cars.

The Calais (Me.) St. Ry. has discontinued the sale of school children's tickets.

The Winnipeg Electric Ry. has ordered 60 car trucks, complete with axles, in the United States.

The Canadian Street Car Advertising Co., Ltd., has surrendered its charter under the Ontario Companies Act.

The Calgary Municipal Ry. has received two single truck cars from the Preston Car and Coach Co., Preston, Ont.

The Galt, Preston and Hespeler St. Ry. has ordered two interurban cars from the Preston Car and Coach Co., Preston, Ont.

Superintendent Doughty, of the Regina, Sask., Municipal Ry., was presented by the employes with a gold locket, Jan. 1.

The Toronto Suburban Ry. is reported to have placed an order for motors and other car equipment with the Canadian General Electric Co.

Accident reports show that during 1911, 19 persons were killed on, or in connection with, the street railway in Toronto, and 28 in Montreal.

The Grand Valley Ry. has notified the Brantford, Ont., city council that it is about to operate a freight service between that city and Paris, Ont.

The Buffalo, Lockport and Rochester Ry. is said to be considering plans for a station to be built near the Dodge opera house square in Buffalo, N.Y.

M. Urwin has been appointed Secretary, British Columbia Electric Ry., London, Eng., vice G. Kidd, appointed Comptroller at Vancouver, B.C., some time ago.

The Toronto and York Radial Ry. has ordered five interurban cars, and has received one double truck interurban car, from the Preston Car and Coach Co., Preston, Ont.

The city of Lethbridge, Alta., has ordered five single truck and five double truck cars, for its street railway, from the Preston Car and Coach Co., Preston, Ont.

The Dominion Power and Transmission Co., Hamilton, Ont., has ordered three double truck city cars from the Preston Car and Coach Co., Preston, Ont.

E. A. Macnutt, of the Sun Life Assurance Co., Montreal, has been appointed Secretary of the Western Railways and Light Co., of Champaign, Ill., succeeding J. B. Macauley.

E. Sterling, heretofore Trainmaster, British Columbia Electric Ry., New Westminster, has been appointed Local Manager, Lulu Island branch, vice G. H. Franklin, promoted.

During Nov., 1911, one fatal and five non-fatal accidents were reported in connection with the operation of electric railways in Canada. The fatality was due to a de-railment.

The British Columbia Electric Ry., during 1911, ordered the following additions to rolling stock:—58 passenger cars, 25 box cars, four electric locomotives, and one steam locomotive.

D. R. Kennedy, heretofore Superintendent of Electrical Construction, has been appointed Superintendent of Power and Lines, British Columbia Electric Ry., Vancouver, vice W. T. Woodroofe, resigned.

A bylaw providing for the operation of cars on the Winnipeg Electric Ry. in the municipality of Kildonan, Man., has been prepared and will be submitted for consideration at the February meeting of the council.

G. H. Franklin, heretofore Local Manager, Lulu Island branch, British Columbia Electric Ry., Vancouver, has been appointed Manager, Interurban Division, New Westminster, vice Allan Purvis, resigned.

The Berlin, Ont., Light Commissioners, operating the Berlin and Waterloo St. Ry., are purchasing two double truck, 45 ft., pay-as-you-enter cars, and are considering the advisability of establishing a 10-minute service between Berlin and Waterloo.

A British Columbia Electric Ry. motorman has been fined $15 for not slowing down his car when it was passing another car that was discharging passengers in Vancouver. This is the second prosecution that has taken place under the B.C. Tramways Inspection Act.

The Lethbridge, Alta., city council has ordered from the Preston Car and Coach Co., Preston, Ont., five 41½ ft. car bodies on trucks, and five 32 ft. 10 in. car bodies on trucks at a cost of $40,158; and from the Canadian Westinghouse Co. 10 complete equipments with air brakes for five cars at a cost of $19,755.

C. D. Warren, of Toronto, is one of the directors of the Keokuk, Nauvoo and Fort Madison Electric Ry. Co., recently incorporated in Illinois, to build an electric railway from Keokuk, Ia., through Hancock county, Ill., with branches to Nauvoo and Carthage. The head office is at Nauvoo, and the capital stock $650,000.

W. T. Woodroofe, Superintendent of Power and Lines, British Columbia Electric Ry., Vancouver, has resigned on his appointment as City Electrician for Vancouver. W. H. Elson, Local Manager, B.C. Electric Ry., New Westminster, has also resigned, no appointment to that position having been made to Jan. 15.

Sir Rodolphe Forget, President, Quebec Railway, Light, Heat and Power Co., E. A. Robert, President, D. McDonald, General Manager, and Patrick Dubee, Secretary, Montreal Tramways Co., are associated with the Montreal South Land and Improvement Co., which has recently purchased about 950 arpents of land at Longueuil, on which it is reported a model city will be built.

F. Swayze, who has been conductor on the Niagara, St. Catharines and Toronto Ry., running between St. Catharines and Niagara Falls, Ont., is reported to have been appointed General Manager of the Niagara, Welland and Lake Erie Ry., which has done some track laying in Welland, Ont. It is said that construction will be continued to Niagara Falls, Port Colborne and other points.

The New York, New Haven and Hartford Rd. management is evidently satisfied with the electric operation of trains between Stamford and New York, 34 miles, as it is announced that the system is to be extended from Stamford to New Haven, 41 miles. The new equipment will be practically identical with that on the existing electric road. The estimated cost of the work is about $4,000,000.

W. Rae, Inspector of Tramways, appointed by the British Columbia Government, has also been appointed Inspector of Railway Equipment by the Board of Railway Commissioners, to enable him to enquire into matters on electric railways, portion of which are under Dominion and provincial charters, as in the case of the B.C. Electric Ry. Co. He does not receive any salary from the Board of Railway Commissioners.

The Milwaukee Electric Ry. and Light Co. owns a hospital car, which, although designed primarily for taking care of passengers injured by street cars, has been used on many occasions by the city in cases where a number of people have been injured. It is fitted with two leather couches and it has a sink with water heated by electricity and electrically heated pads which are used in place of hot water bottles. It also has a case fitted with instruments and necessary appliances for first aid work.

The Guelph Radial Ry., which is owned by the city of Guelph, Ont., has been reorganized as follows:—Mayor, G. J. Thorp, Chairman; J. W. Lyon, J. W. Pequegnat, C. E. Howitt and W. E. Buckingham. On account of being opposed to the extension of the line to the city limits in St. Patrick's ward, J. J. Drew, K.C., who has been a member of the board since its formation, resigned, and the Treasurer, G. B. Ryan, also resigned for that and other reasons.

A circular issued by Sir Rodolphe Forget, President, Quebec Ry. Light, Heat and Power Co., announces that H. G. Matthews, heretofore Assistant to the President, has also been appointed General Manager, vice C. E. A. Carr, resigned. Another circular issued by W. G. Ross, President, Quebec Ry. Light and Power Co., announces that Mr. Matthews has been appointed to a similar position in that company. The Quebec Ry. Light, Heat and Power Co. is the holding company, the railways being operated by its subsidiary, the Quebec Ry. Light and Power Co.

Electric Railway Projects, Construction, Betterments, Etc.

Brandon, Man.—The city council received up to Jan. 16 offers for the franchise for an electric railway in the city, which are now under consideration. (Jan., pg. 38.)

The British Columbia Electric Ry. laid 29 miles of new track in 1911, exclusive of the reconstruction of part of the existing tracks on account of new paving on 11 miles of streets, and new part track on new paved streets for 2.5 miles.

Negotiations are in progress for a settlement of the Point Grey franchise difficulty, but in the meantime the company is appealing against the recent judgment declaring the franchise valid.

A proposition has been made by certain interests on Nanaimo St., Vancouver, to offer the company a bonus of $55,000 for the building and operation of a line from Hastings St. to Broadway, about 18 blocks. (Jan., pg. 38.)

Buffalo and Fort Erie Ferry Ry.—A proposition is under consideration by which the company will build a line from Crystal Beach to Port Colborne, Ont., connecting there with the Niagara, St. Catharines and Toronto Ry. The proposal is that the latter company shall operate the line as a part of its system. The B. and F.E.F. Ry. also proposes to build a second track on its line between Crystal Beach and Fort Erie. (See Fort Erie Ferry Ry., Feb., 1910, pg. 147.)

Calgary Municipal Ry—A bylaw authorizing the expenditure of $442,000 for various works, including the extension of the railway to the site of the C.P.R. shops at Maharg, 4½ miles east of Calgary station, was approved by the taxpayers at the recent elections. (Jan., pg. 38.)

Calgary to Shepard, Alta.—The Alberta Legislature is being asked to incorporate a company to build an electric railway from Calgary to Shepard, Alta. Lathwell and Waters, Calgary, are solicitors for applicants.

The Dunnville, Wellandport and Beamsville Electric Ry. Co. is applying to the Dominion Parliament to extend the time within which the lines authorized may be built, and also to declare that the company may use other motive power than electricity. J. R. Roaf, Toronto, is the solicitor. (Oct., 1911, pg. 973.)

Humber Valley Electric Ry.—Application is being made to the Ontario Legislature to incorporate a company to build an electric railway from Dundas St., Lambton Mills, Ont., southerly to the Humber River, thence to Bloor St., crossing the river, and thence southerly along the east bank of the river to the Lake Shore road at Humber Bay, and easterly along the Lake Shore road to Sunnyside Ave., with power to build branch lines, and to make connections with other lines. W. H. Price is solicitor for applicants. The railway is projected as a part of the plans for the development of the Humber boulevard property of which R. Home Smith, of Toronto, is the promoter.

Kawartha Transportation Co.—The Ontario Legislature is being asked to incorporate a company with this title to build an electric railway from Peterboro, through Lakefield, to Clear Lake, thence to Stony Lake, to Apsley, Ont.; from Peterboro to Cobourg Lake and from Peterboro to Rice Lake, Ont. Hall, Hayes and Hall, Peterboro, Ont., are solicitors for applicants.

Lethbridge, Alta.—Following the approving of the bylaw authorizing the building of an electric railway as a municipal undertaking, the city council Jan. 10 authorized the purchase of a site for a car barn, the erection of the necessary structure, and appointed Superintendent Reid as General Superintendent of the Power, Light and Street Railway Department. At a previous meeting additional equipment for the power house, in order to provide for the operation of the railway, was ordered. Contracts have been let for the paving, steel rails, materials for overhead work, car equipment, etc., all for speedy delivery. (Jan., pg. 38.)

London Street Ry.—Local press reports state that a definite proposition will be made by the company to the London, Ont., city council for the taking over of the lines. The franchise does not expire until 1925, but as the company must make a considerable expenditure upon betterments and extensions it is thought that the present is a favorable time for a change in ownership. The price put on the property is stated to be $800,000. (Jan, pg. 38.)

The Monarch Radial Ry. Co. is applying to the Ontario Legislature to extend the time within which the projected railway may be built; to increasing the bonding power from $25,000 to $30,000 a mile; and to change its name to the Toronto, Barrie and Orillia Ry. Co. Lennox and Lennox, Toronto, are the solicitors. (Dec., 1911, pg. 1171.)

Moncton Tramways, Electricity and Gas Co.—The line built and placed in operation by this company extends from King St. to John St., Moncton, N.B., two miles. (Jan., pg. 38.)

Montreal Tramways Co.—The Quebec Legislature is being asked to confirm the amalgamation of the Montreal Street Ry. and its various subsidiary companies under the title of the Montreal Tramways Co. The city council decided Jan. 13 to ask that the bill be not considered by the Legislature's committee before Feb. 15 in order that the city may be heard in opposition. The Provincial Secretary has authorized the M.T. Co. to do business in the province of Quebec, with E. A. Robert as its principal agent. (Jan., pg. 39.)

North Midland Ry.—The St. Marys, Ont., ratepayers have ratified a bylaw granting $5,000 in aid of the building of the N.M. Ry. into the town. London, Ont., ratepayers have ratified a bylaw granting the company a bonus of $25,000. (Jan., pg. 39.)

Owen Sound, Ont.—A conference has been arranged with the town council in connection with a proposal to establish an electric storage battery car line in the town. (Dec., 1911, pg. 1173.)

Ontario West Shore Ry.—A meeting of the representatives of the town and township municipalities which guaranteed the bonds of this company was held in Goderich, Ont., Jan. 12, to consider the position. The four municipalities interested guaranteed the interest on $400,000 of bonds, on condition that an additional $200,000 was expended upon construction. About 15 miles of the line has been completed from Menezt, across the river from Goderich in the direction of Kincardine, but it is not being operated. The municipalities have been called upon to pay an instalment of interest. A suggestion has been made that the municipalities take over the line, complete it and operate it as a municipal work. A report is current that the C.P.R. has been considering the taking over of the line. J. W. Moyes, Toronto, is President. (Dec., 1911, pg. 1171.)

Quebec Ry., Light and Power Co.—Press reports state that the company has secured the water power rights on the first 30 miles of the Saguenay River out of Lake St. John, Que., and that it is proposed to develop 50,000 h.p. for industrial purposes in Quebec and district. (Jan., pg. 39.)

The Rainy River Radial Ry. Co. is asking the Dominion Parliament to extend the time within which the lines of railway authorized to be built by chap. 152 of the statutes of 1910, may be built. Machin and Ap'John, Kenora, Ont., are the solicitors. (Mar., 1910, pg. 233, and June, 1910, pg. 433.)

The Rennell Sonnet Development Co., which is incorporated under the British Columbia Companies Act, is applying to the B.C. Legislature to authorize it, among other things, to build tram lines on Graham Island.

The Rural Ry. Co. of Manitoba is asking the Manitoba Legislature for power to amalgamate with other similar companies. Mulock, Loftus, Armstrong and Lindsay, Winnipeg, Man., are the solicitors. (June, 1911, pg. 577.)

St. Thomas St. Ry.—A bylaw authorizing the expenditure of $210,000 for the extension of the municipally owned electric railway in St. Thomas, Ont., to Port Stanley, Ont., was defeated by a large majority at the municipal elections Jan. 1. (Jan., pg. 39.)

Toronto Civic Car Lines.—A bylaw providing for the building of a tube railway to be operated by electricity from Front St. to St. Clair Ave., along Bay Terauley and Yonge Streets, was defeated by a majority of about 3,000 at the civic elections Jan. 1. (Jan., pg. 40.)

The Toronto Suburban Ry. Co. is asking the Ontario Legislature for an extension of time for the building of the company's lines and extensions; for authority to build an extension from near Guelph to near Berlin, Preston, Hespeler and Galt., thence to Hamilton; for the insertion after the words county of Peel in sec. 1 of the Act of 1910, the words "or from some point on its authorized Hamilton line at or near Cooksville"; for power to increase the capital stock and for authority to issue debenture stock for the purpose of providing bridges, terminals, station houses, generating plants, etc.

The York tp. council, Jan. 15, granted permission to the company to extend its line from the northerly limits of Weston village to the northerly limits of the township. The plans show a line running along the Weston road for 0.6 of a mile, and then across country by a private right of way to Woodbridge. The extension will be between nine and ten miles. The surveys for the extension of the Lambton line, which were completed some time ago, mainly on a private right of way as far as the Etobicoke River, have now been extended into Peel county. Crossing the Etobicoke River, the surveyed route gets to the south of Dundas St. just west of Summerville, and continuing on a private right of way gets to the C.P.R. near Dixie station and runs alongside the steam railway tracks to Cooksville station, whence it strikes northwesterly. Surveys for several routes beyond this have been made. It is said that work will be gone on with on the extension to Woodbridge, and the extension from Lambton as far as the crossing of Dundas St., at the C.P.R. tracks, Cooksville, this season. (Dec., 1911, pg. 1173.)

Winnipeg Electric Ry.—The question of the further extension of the company's lines is under consideration, but it is not expected that any announcement will be made until shortly after the annual meeting, which is fixed for Feb. 14.

The St. Boniface city council has approved of several extensions of lines in the city which are to be completed by July, 1913.

A bylaw to raise $25,000 by debentures for a power distribution plant, and another for the purchase of 100 h.p. electric power from the Winnipeg, Selkirk and Lake Winnipeg Ry., have been approved by the taxpayers of Selkirk, Man. The W.S. and L.W. Ry. is a subsidiary of the W.E. Ry. (Jan., pg. 40.)

Marine Department

The Grand Trunk Pacific Ry. Marine Terminal, Prince Rupert.

By F. E. Kirby and W. T. Donnelly, Members of the Society of Naval Architects and Marine Engineers.

When, in 1910, the authors of this paper were retained to visit the Pacific Coast for the purpose of studying the shipping and marine repair facilities and to visit Prince Rupert, the western terminus of the Grand Trunk Pacific Ry., they were at a loss how to proceed, for not only was Prince Rupert beyond their geographical knowledge, but it also failed to appear upon any available map or charter. However, with an abiding faith in the G.T.P.R. they undertook the commission. Proceeding to the Pacific coast over the Northern Pacific Ry., they visited Portland, Seattle, Tacoma and Bremerton in the U.S., and Victoria, Vancouver and New Westminster, B.C., finally proceeding from Vancouver on a C.P.R. steamship northward through the inland passage, and after three days steaming through the narrow waterways which were literally the submerged valleys of the Coast Range, they arrived on the evening of the third day in Prince Rupert harbor and were, for the first time, fully convinced that such a location actually existed.

Those who are especially interested and desire to extend their geographical knowledge, are referred to the most recently published charts of the Northern Pacific and Alaskan coasts, on which Dixon's Entrance, north of Graham Island between 54 and 55 degrees north latitude, can be readily located. To the east of Dixon's Entrance, Brown Pass leads to Chatham Sound and across this to the east, between Digby and Kaien Islands, is found Prince Rupert harbor. So hidden away and unprepossessing is the entrance that until 1906 it was supposed to be unnavigable. Actual surveys show it to be one of the most easily entered and satisfactory harbors on the Pacific coast. The entrance, which is from the south, is about three-eighths of a mile wide. It is entirely unobstructed with a depth of water nowhere less than 20 fathoms. The entrance may be said to extend northward for three miles, when the harbor is reached, extending northeast for four miles, with an unobstructed width of from one and a half to three-quarters of a mile.

Drydock, Ship Repair and Shipbuilding Plant, as they will appear when completed.

The city of Prince Rupert is located on Kaien Island, which forms the right of the entrance, and the southeast of Prince Rupert harbor. The city proper is laid out over an area three and a half miles long by one mile in breadth, on the shores of the island, with a background rising to an elevation of from 1,600 to 2,000 ft., the general characteristics reminding one very forcibly of the city of Montreal with Mount Royal behind it. The G.T.P.R. will reach the coast by the Skeena River valley, about 15 miles to the south, and crossing to Kaien Island at its southern end, will closely follow the shore to and along the water front of Prince Rupert.

The general character of the shore of Prince Rupert is bold and rocky, falling off very rapidly to a depth of approximately 20 fathoms. A careful examin-

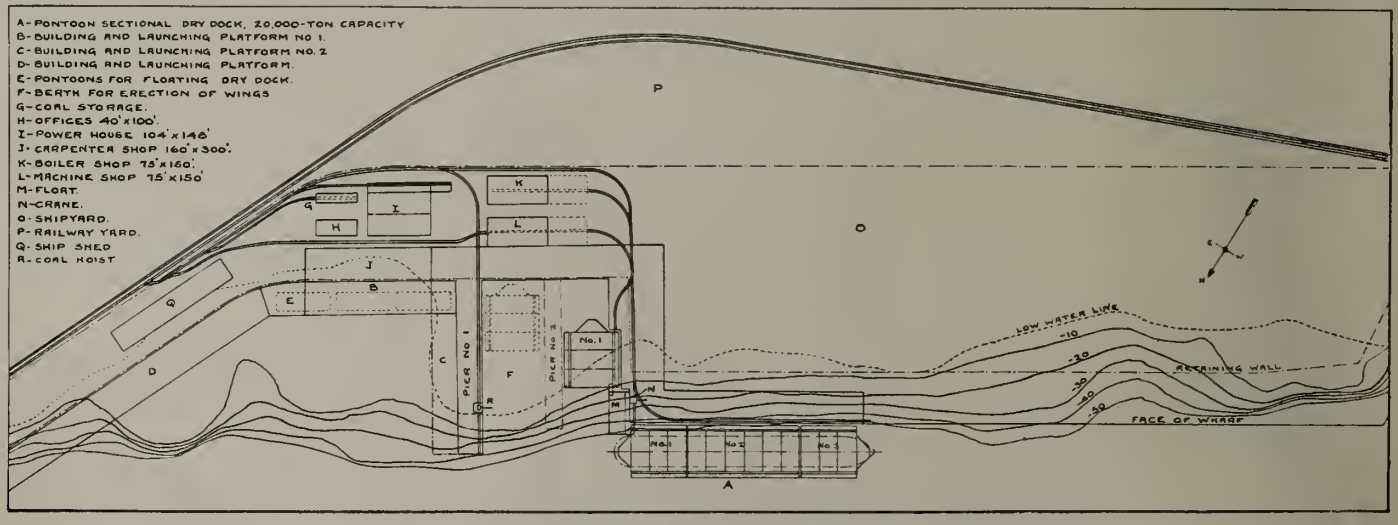


Fig. 1. Location of Drydock, Ship repair and Shipbuilding Plant, Prince Rupert.

ation of the entire length of the harbor front of Kaien Island determined Hays Cove as the only practical place for such a development as was contemplated; that is, a floating dry-dock of 20,000 tons lifting capacity, so designed as to be capable of operating in sections as

a number of smaller docks, an adequate shore plant comprising electric power generating plant with air compressors, machine shop, boiler and blacksmith shop and covered construction shed under which the pontoons of the floating dry-dock could be built.

The dock is to be of such a design and construction as to be almost entirely built upon the site. To accomplish this, the general plan provides for the practical completion and equipment of the shore plant before the dry-dock is commenced.

One of the controlling features in the general plan of this development was the fact that Prince Rupert will be 600 miles from the nearest base of supply or point where any considerable assistance, mechanical or otherwise, can be obtained. It was, therefore, determined at the outset that the mechanical equipment, large tools, etc., must be of the very best and most complete. Also, that on account of the high price of labor on the Pacific coast, ample provision for the use of power in every way possible should be made. This has resulted in the design of an electric power generating station with ample capacity for all present needs and with a large possibility of extension.

As the plans were laid out in such a manner as to make the development progressive, constructing those parts first which could, when completed, be used in the construction of the remainder, this outline will be followed in the description.

Fig. 1 gives a general plan of the plant, showing location of dry-dock, piers and buildings.

PIER AND PLATFORM WORK.—The first work to be undertaken will be the pier, marked "Pier no. 1" on the general plan. This will be 420 by 60 ft., the piling being on 10 by 5 ft. centres. The pier will require about 600 piles.

At the same time, there will be built the platform at the shore end of this pier 80 by 930 ft., having an area of 74,400 sq. ft., and will require about 1,600 piles on 5 by 10 ft. centres.

At the western end of this platform there will be an extension off shore 350 by about 100 ft., and at right angles to this, an extension 560 by 80 ft. for the attachment of the floating dry-dock. A double line of diagonal bracing is used in the pile work. This is on account of the excessive rise and fall of tide, which for spring tide is 25 ft. The tops of the piles are thoroughly secured by double 6 by 12 clamps and connected by 12 by 12 caps. The decking is to be of 4 by 12 planking. Piles are to be creosoted. The total area of the platform and pier work will be 181,400 sq. ft. The completion of this work, it is expected, will provide ample space for the landing and handling of materials for the rest of the plant.

LAUNCHING PLATFORM.—In front of the main platform, east of the pier, there will be built a launching platform for side launching. This will be 80 by 440 ft. and will be carried on 16-in. piles on 5 by 10 ft. centres, braced and reinforced by heavy piling along the edge, over which the launching will take place. The general arrangement and bracing of this piling can be seen by referring to fig. 2, showing the platform in connection with the building shed. It will be noticed that the outer half of the building platform has a slope of 1¾ ins. to the ft., which is approximately the launching grade for side launching.

POWER HOUSE.—The general location of the power-house will be seen by referring to fig. 1. Electric power is to be furnished for operating the pumping machinery of the floating dry-dock, for compressing air and to operate machinery in the various shops; also, for furnishing electric lighting for the plant. The building is to contain both boilers and power plant under one roof with fireproof dividing walls, and is to be 104 by 148 ft., having a covered area of 15,392 sq. ft. It will be of modern steel-frame construction, the walls and roof to be of reinforced concrete.

There will be installed 6-400 h.p. water tube boilers, supplied with automatic stokers, chain-grate type, such as are known to give good satisfaction with Pacific coast coals. Provision is made for adding two extra boilers. There is also a provision for the installation of an economizer, in case it is found that the load factor warrants the expense. Draught will be obtained by a steel or concrete chimney 175 ft. high and 11 ft. in diameter. An overhead trolley is provided for handling coal from storage to hoppers above the stokers and also for handling ashes.

COAL HANDLING AND STORAGE.—Provision is made for receiving coal both by water and rail. Coal by water will be received at the outer end of the pier, for the unloading of which there is provided a standard grab-bucket installation, so arranged as to load cars beneath the hoppers, the cars to be handled by small yard locomotives to the coal pocket of 1,000 tons capacity, located adjacent to the boiler house. Coal received by rail will be delivered direct from the G.T.P.R. cars, which pass at the rear of the property, to the coal pocket approached by an incline.

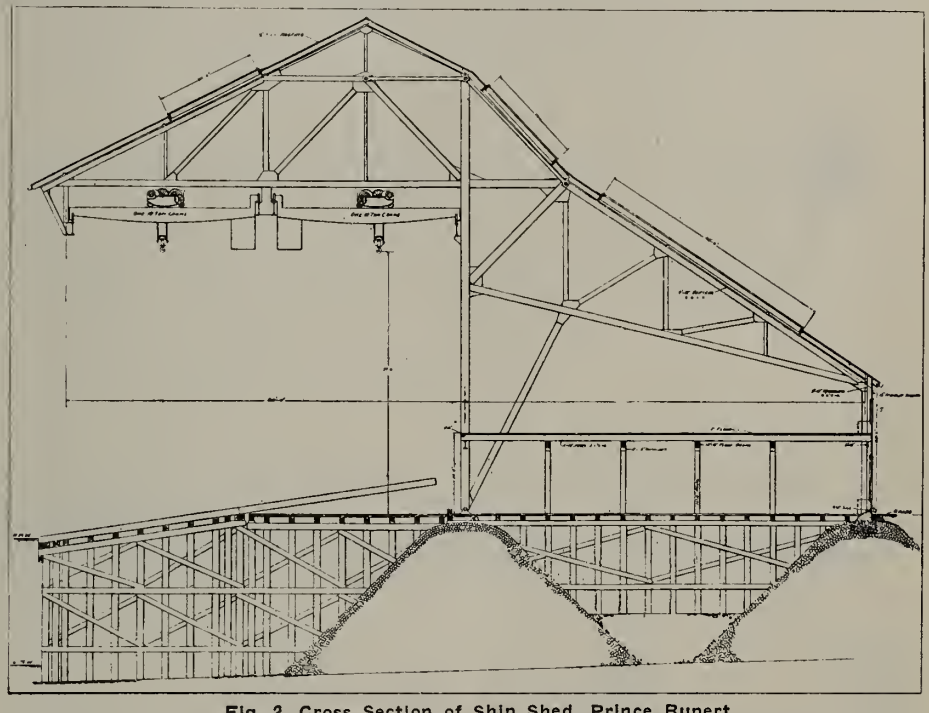


Fig. 2. Cross Section of Ship Shed, Prince Rupert.

MAIN ENGINES.—There will be two main engines of 900 h.p. each, and while vertical reciprocating compound engines are specified, using steam at 175 lbs. pressure and 258 r.p.m., turbine engines will be considered as an alternative.

CONDENSERS.—Jet condensers are planned, but alternate figures will be taken for service condensers. The type to be used will depend upon local conditions as to the cost of water at the time of installation. Condensing water will be obtained through the rock cutting and shaft sunk within the power-house, the circulating water being handled by a vertical centrifugal pump operated by an electric motor.

GENERATORS.—Electric generators are to have a capacity of 600 k.w., 3-phase, 25-cycle, 550-volt alternating current. For these generators there will be provided two steam-driven exciters, one of 50 k.w. and one of 25 k.w. capacity. These machines are to be direct current, 220 volts. There is also to be a motor-driven exciter of 25 k.w. capacity, the motor for this machine to be a 35 h.p., 3-phase, 25-cycle, 550-volt alternating current squirrel-cage-type motor.

CRANES.—There will be provided for the erection of this machinery in the power plant, a 15-ton overhead travelling crane. This will be operated by electricity and the current supplied will be from one of the steam-driven exciter sets.

AIR COMPRESSOR.—For furnishing compressed air to the shops of the plant, there will be provided a compound Corliss air compressor having a displacement of 1,580 cu. ft. of free air per minute when operating at 150 revs. This compressor is to be designed for a steam pressure of 175 lbs. per sq. in. and for an air pressure of 100 lbs. The distribution of the air will be by means of underground piping through the yard.

SWITCHBOARD AND DISTRIBUTION SYSTEM.—The entire system of light and power throughout the plant is to be controlled from the switchboard located on the main floor of the power-house. The switchboard is to consist of 15 panels. The construction throughout is to be most substantial and thorough, fully meeting the best standards of central station distribution.

CUT AND FILL AND FOUNDATIONS.—By referring to fig. 1, showing the natural conditions of the site, it will be seen that the ground is very difficult, all the property either having to be cut down or, raised to grade by fill. The location of the power-house was determined by the condition of the ground, which, at this location, is of rock which will have to be reduced to the grade required. The cut and fill work is intended to go forward at the same time as the pier work, and the power plant will be commenced as soon as the site can be levelled. The rock cut for the power-house and yard grading will amount to 18,000 cu. yds., the rock fill for retaining walls, 57,000 cu. yds., and the earth fill for grading, 73,000 cu. yds. The dredging between the pier and dry-dock bulkhead will amount to 100,000 cu. yds. to obtain a depth of water of 20 ft. at low tide.

BOILER AND BLACKSMITH SHOP.—The combined boiler and blacksmith shop is to be 76 by 150 ft., the central part to be 33 ft. wide, provided with a 15-

ton travelling crane. The design is of the usual steel-frame shop construction with side bay, and will, in this instance, be covered with wood. The flooring will be of concrete with heavy foundations for the large tools. The tool equipment will be very complete, comprising heavy punch and shears, rolls, plate planer, flanging clamps, etc., heavy steam-hammer and a full equipment of blacksmiths' tools.

THE MACHINE SHOP will be constructed from the same set of plans as the boiler and blacksmith shop. The flooring will be of concrete with special foundations for large tools. Ample provision is made for thorough lighting and the building will be steam-heated throughout. A very complete equipment of machine tools will be provided, comprising all machinery necessary to handle the heaviest crank and other shafting of large steamers; also, boring, drilling and turning machinery for repairing all the secondary machine equipment of steamships. Large tools will be driven by individual motors, the smaller tools being arranged for group driving. A 15-ton overhead travelling crane will be provided for both boiler and machine shops. The building will be supplied with compressed air and a special room will be fitted up for the repair and care of air tools.

By referring to fig. 1, it will be seen that the location of the machine shop is such that ready access may be obtained from the dry-dock and water front, and it will be noticed that provision is made for entering the boiler and machine shops with railway cars. Provision is also made for the extension of these shops as the business develops.

BUILDING SHED AND WOODWORKING SHOP.—On account of the excessive rainfall in Prince Rupert, it will be necessary to do the work of building the pontoons for the floating dry-dock under cover.

In laying out the general plan for the property and in view of its future development, the possibility of shipbuilding was carefully considered, and while there is no immediate prospect for the building of steel vessels so far from the base of material, it was thought advisable, in preparing for the building of the pontoons under cover, to make the construction of a permanent nature, suitable for shipbuilding, to be used in the immediate future for wooden shipbuilding and later on for steel shipbuilding. To accomplish this, the building shown in fig. 2, has been developed. This building is located over the launching platform and over part of the general platform extending eastward from pier 1, with foundations carried down to rock.

It will be seen from the general plan, fig. 1, that the property is laid out for side launching, this being the only practical development that was possible under existing natural conditions. The building about to be described is the result of these conditions. While side launching is unusual in Europe and general in America, it is practically universal on the Great Lakes, and the general design of this structure is the result of experience there.

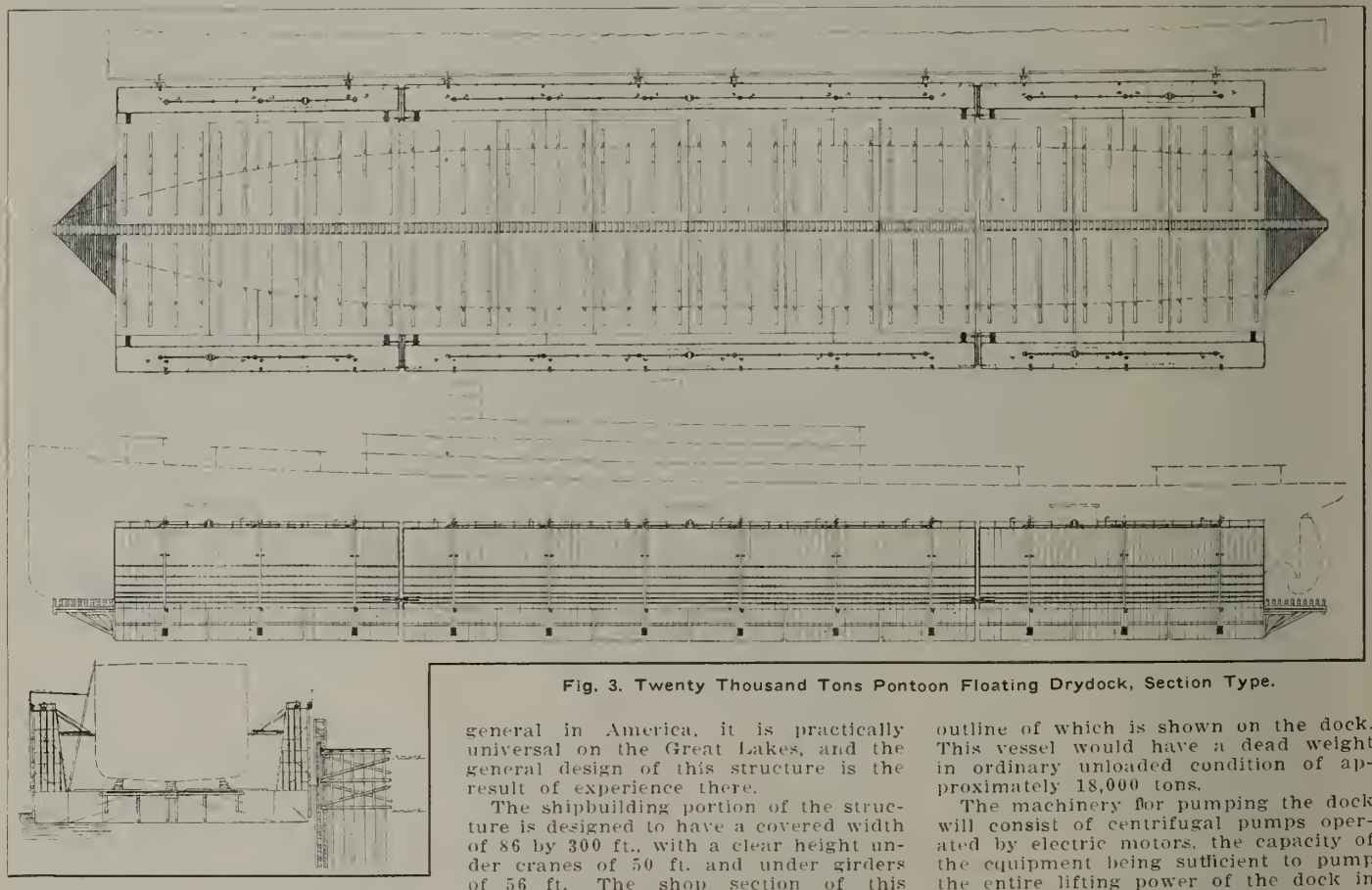


Fig. 3. Twenty Thousand Tons Pontoon Floating Drydock, Section Type.

The shipbuilding portion of the structure is designed to have a covered width of 86 by 300 ft., with a clear height under cranes of 50 ft. and under girders of 56 ft. The shop section of this building is to be 80 by 300 ft. The ground floor will be used for machinery and the upper floor will be used as a laying-out floor. The equipment of woodworking machinery will be most complete, comprising large re-saw band saw, timber sizer, rip and crosscut saws and other woodworking and finishing machinery.

ADMINISTRATION BUILDING.—There will be an office and administration building 40 by 100 ft., constructed of wood two and a half stories high. This will be fitted up with draughting room, accounting and bookkeeping department and private offices. The exact location of this building has not been determined, as this will depend largely upon the opening and grading of streets approaching the property.

TWENTY THOUSAND TON PONTOON Floating Dry-dock.—Referring to fig. 3, there will be seen the general design drawing of a 20,000-ton pontoon floating dry-dock, description of which has been reserved until the last from the fact that, as previously stated, it is to be almost entirely constructed at and by the plant of which it is to be the principal feature.

This dock is to have an over-all length on keel blocks of 604 ft. 4 ins., a clear width of 100 ft., and a width over-all of 130 ft. The lifting power is the aggregate of 12 pontoons of timber construction, each 130 ft. long corresponding to the width of the dock, 44 ft. wide in a direction corresponding to the length of the dock and 15 ft. deep. These pontoons are to be united by steel side walls or wings 38 ft. high, 15 ft. wide at the bottom, and 10 ft. wide at the top, the walls being divided so that the whole structure may be used under ordinary conditions as three separate docks, one of six pontoons, with an over-all length of 269 ft., and two of three pontoons each, with an over-all length of 164 ft. each. The largest commercial ship upon the Pacific Coast at the present time is the Minnesota, the outline of which is shown on the dock. This vessel would have a dead weight in ordinary unloaded condition of approximately 18,000 tons.

The machinery for pumping the dock will consist of centrifugal pumps operated by electric motors, the capacity of the equipment being sufficient to pump the entire lifting power of the dock in less than two hours. A detailed description of the pumping machinery will be given later.

The structure as a whole is secured to the shore by the engagement of clamps on the dock with a vertical truss secured to the pile platform or pier in such a way that it is free to rise and fall with the tide, and when being raised or lowered with a ship. The location of these attachments is such that when it is desired to use the dock in three separate sections, the bow section may be detached and moved around the corner of the pier work located as shown on the general plan alongside the platform, and secured in the same manner as provided for in its original position. To make the other two sections available as separate docks, it is only necessary to detach the middle section, comprising six pontoons, from the pier work and advance it the length of the detached section, when the sliding clamps upon the wings will coincide

with those used for the previous section when the dock was operated as a whole. This will allow ample space between the centre and stern sections for the overhang without interference of vessels which may be docked on them.

As the feature of a sectional dock to be used as a whole or separately is somewhat new, it is desired to call attention to the fact that the three largest commercial docks in the United States, namely, the 10,000-ton floating dry-dock of the Tietjen and Lang Dry-Dock Co., built in 1900; the 12,000-ton dock of the Mores Dry-Dock Co., built in 1902 (both in New York harbor), and the 10,000-ton dock of the port of Portland, Oregon, are sectional docks in five sections each. All of these docks are of timber construction, and are giving excellent service.

PONTOONS.—As previously stated, the pontoons for this dock are to be 12 in number, constructed entirely of timber. They are to be 130 ft. by 44 ft. by 15 ft. deep, with a crown of 3 ins. at the centre, and will have 15 trusses spaced on 3-ft. centres. There will be a centre water-tight bulkhead 12 ins. thick, and above this bulkhead the centre will be reinforced for carrying keel blocks. There will be three partial bulkheads on each side to stiffen the pontoons. All diagonal braces are heavily reinforced with anchor stocks. The arch brace is made up of planking through-bolted with screw bolts, and is intended to take the reverse stresses when the dock is floating light. This is a considerable amount when it is considered that the wings are superimposed weights carried at the extreme ends of the trusses, supported by an evenly distributed pressure over the entire bottom. Six by 12-in. deck beams are worked across the upper and lower truss members, carrying the 5-in. deck and bottom planking parallel to, and reinforcing the truss members for the maximum stress. This construction also makes it possible to get in double vertical tie rods alongside of bulkheads in such a manner that they may be replaced at any time. The whole structure is made water-tight by caulking with white pine wedges.

To protect the exterior from teredo and other marine worms, it is first thoroughly graved with tar poisoned with arsenic, then sheathed with two layers of hair felt, each thoroughly saturated with tar and arsenic, and then with creosoted lumber, also treated with arsenic and thoroughly secured with galvanized nails. This treatment, together with the facility for inspection afforded by the possibility of detaching and docking any pontoon, has been found to give satisfactory protection.

Each pontoon will require approximately 330,000 board ft. of lumber or a total, including outrigger or prow on the end pontoons, of 4,000,000 board ft. The entire bill of lumber will be of selected grade of Oregon pine or Douglas fir.

As previously stated, it is the intention to have these pontoons built upon the launching platform under the building shed, using the tools and equipment provided for the plant. Sufficient room has been allowed to build three pontoons at the same time. As soon as they are launched they will be moved into the basin between the pier and dry-dock platform and temporarily united together in correct relative position by timber clamps, when they will be ready for the erection of the steel wings.

THE STEEL WINGS consist of channel and angle frames on 3-ft. centres corresponding to the trusses of the pontoons, and a covering of plating varying in thickness from ½ to 5-16 in. The construction is greatly facilitated by reinforcing the plating against water pressure on the outside by horizontal angles. This does away entirely with troublesome intercostal connections and gives the material used very much greater value in the construction as a whole.

There will be required about 2,200 tons of steel. Where the wing meets the deck of the pontoon there is a steel shoe secured to the frame of each pontoon and a corresponding shoe riveted to each frame of the wing. These are connected together by a steel link about 15 ins. long and pins, the upper one of which is tapered ½ in. to the foot. The driving of this pin wedges the pontoon and wing together. At the point of contact, the bottom of the wing is reinforced by a 12 x ½ in. plate and made water-tight by canvas packing saturated with red lead. On the outer side of the wing the method of securing is similar, except that the shoe on the pontoon is replaced by a cast-steel strap through-bolted to the pontoon.

Provision is made for multiple punching on uniform centres of 3 ins. and 6 ins. throughout, and the intention is to have the material fabricated in Europe or the eastern part of the United States, all frames assembled and shipped by water to Prince Rupert. The erection of the first section is to be commenced as soon as the first three pontoons are launched, the compressed air machinery of the plant being used for pneumatic riveting.

PUMPING MACHINERY.—The dock will be pumped by 24 12-in. centrifugal pumps, one in each end of each pontoon. The pump suction will take water from the bottom of the pontoon, the suction being protected by a liberal area of screen. Delivery will be directly through the flood-gate used in lowering the dock.

The pumps will operate at approximately 275 r.p.m., being driven by a vertical shaft. All the pumps on each side of each section will be driven through gearing and horizontal shafting by one electric motor, as shown in fig. 3. A jaw coupling is provided in the wing at about the level of the top of the pontoon for disconnecting the vertical shaft when the pontoon is removed for self-docking.

There is also an indicator for determining the level of water in the wings. This consists of a counterweighted float in vertical guides and a vertical rod extending through the deck of the wing. As the water enters the wing, the float rises and the height of the rod above the deck will indicate the depth of the water in the wings.

A similar device is provided to show the depth of the water in the pontoon. The flood-gates are operated to control the lowering of the dock and also to control the pumping collectively and individually of the different pumps, it being understood that with the pumps running, no water will be delivered if the flood-gates are entirely closed, and that, by a regulation of the gates without altering the speed of the pumps, any degree of control or any distribution of control can be accomplished. In case one side is rising too rapidly, the partial closing of the gate on that side, without disturbing the operation of the machinery, will effect the control, or the gates may be left at the same opening and the machinery stopped.

By this method, a much quicker and more powerful control may be obtained, as not only will the discharge of water from the dock stop, but will immediately commence to enter, thus doubling the power of control which would be obtained by closing the gates.

ELECTRICAL EQUIPMENT.—As previously explained, the group of pumps on each side of each section of the dock will be operated through horizontal and vertical shafting by one electric motor. Thus, for the two smaller sections of three pontoons each there will be required four 100 h.p. motors, and for the larger section of six pontoons there will be required two 200 h.p. motors. The motors are to be alternating current, 3-phase, 25-cycle, 550 volt, and will operate at approximately 500 r.p.m. They are to have wound rotors and slip rings for variable speed control. The armature shaft is to be extended both ends and will operate the distribution shafts through reduction gearing at a speed of approximately 275 r.p.m.

There will be two motors on each section, one on each wing. The power circuit on the pier is connected to the power circuits on the sections by flexible cables. The power circuits of each section are independent from the main circuit, so that each section receives its power independently, but the control system is to be so arranged that the two motors on any section may be operated from one master panel or the combination of any two sections may be operated from the master panel on either of the two sections, and lastly, when all three sections are used together, all six motors are to be controlled from the master panel on the middle or larger section.

THE MASTER PANEL is to consist of a panel or drum having suitable contacts or switches for independently starting or stopping any of the motors. The starting or stopping of any one motor or a number of motors will not affect other motors at rest or in operation. The provision is also to be made for operating any or all motors at one-half, three-quarters and full speed.

COMPRESSED AIR EQUIPMENT.—While steam-driven air compressors are provided in the power plant to furnish compressed air for the shops, it was deemed advisable on account of difficulty due to the extreme rise and fall of tide, to make flexible air connections to the floating dry-dock and to provide an electrically driven air compressor upon each section.

On one side of each section there will be provided an electrically driven air compressor having a capacity of 500 cu. ft. per min. The air will be delivered to a receiver in the wing below, and from this to air piping carried along the bottom to each side of the wing, with multiple outlets for the connection of air hose to the pneumatic tools. Provision will also be made for connection between the sections of the dock when they are operating together.

Electric current for operating the air compressors will be taken from the circuits supplying the motors for pumping the dock, and as air will be used only after the dock is pumped up, the capacity of these circuits will be more than ample.

OPERATING EQUIPMENT, BILGE BLOCKS, Keel Blocks, etc.—The keel blocks are to be of oak 12 x 16 ins. x 4 ft. long, and are to have a height of 4 ft. The bilge blocks are to be on about 12-ft. centres, and operated according to the usual American practice by means of a galvanized chain on the floor of the dock and a leading rope through 6-in. sheaves secured to the wing near the deck, leading up and returning over the pipe railing around the tops of the wings. The return rope leads to the tail dog and is used in tripping the dog and pulling the block out when the ship is leaving the dock. The bilge blocks are provided with an elevating screw which has been found to be of great service for removing blocks one at a time for painting.

In the American practice of handling floating dry-docks, side shoring is not used. There is a general practice, however, of using centring rams for locating and steadying the vessel in position until firmly at rest upon the keel and bilge blocks. The arrangement of these rams can be seen in fig. 3, showing the general design of the dock.

ILLUSTRATIVE DISPLAY DRAWING.—There is submitted herewith an illustrative

display drawing or perspective view (see half-tone illustration, pg. 51), carefully prepared as to relative scale and proper angular projection from the plans, the background being worked in from actual photographs taken, approximately, from the view point of the illustration. The vessel as shown requiring the full lifting power of the dock is the Minnesota, and lying alongside, to convey more clearly the scale of the structure, is shown the new G.T.P.R. steamship Prince Rupert, running between Prince Rupert and Vancouver. While such a drawing is unusual, its value as a ready means of conveying information must be apparent to all. The use of similar illustrative plans is customary with architects, and it is believed that the practice may be adopted to advantage by engineers generally.

The foregoing article was read before the Society of Naval Architects and Marine Engineers in New York recently.

We are indebted to Engineering News for the half-tone illustration.

Niagara Navigation Co.'s Annual Meeting.

Following are extracts from the report for the year ended Nov. 30, 1911, presented at the annual meeting in Toronto Jan. 9:—

As announced in circular to shareholders, Nov. 27, 1911, the steamers Turbinia, Modjeska, Macassa, and wharf properties at Hamilton belonging to the Turbine Steamship Co., and the Hamilton Steamboat Co., have been acquired. Payment for these properties will be made with 1,981 shares of Niagara Navigation Co. stock, and $122,660 cash.

One thousand and two shares of Niagara Navigation Co. stock will be allotted to shareholders at par, and thus our authorized capital stock is practically exhausted. In order to provide for future developments it is proposed to increase the capital stock by $2,000,000, making the total capitalization $3,000,000.

After providing for dividend, interest on debentures, writing $9,725.33 off steamer values, and placing $60,000 to renewal and betterment fund, the balance to credit of profit and loss account stands at $157,756.53.

ASSETS.

Steamboats	$809,725.33	
Less written off	9,725.33	
		$ 800,000.00
Dock properties, Toronto and Niagara River		352,700.00
Accounts receivable		10,196.05
Cash in bank		121,284.52
		$1,284,180.57

LIABILITIES.

Capital stock authorized	$1,000,000.00	
Subscribed and paid		$ 701,700.00
Debentures outstanding 4½%	227,000.00	
Accrued interest	4,278.75	
		231,278.75
Reserve for renewals and betterments		100,000.00
Accounts payable		1,877.29
Mortgage on Yonge St. dock property due Dec. 5, 1912		63,500.00
Dividend 4%, payable Jan. 3, 1911		28,068.00
Balance at credit of profit and loss		157,756.53
		$1,284,180.57

PROFIT AND LOSS ACCOUNT.

Balance Dec. 1, 1910		$141,317.30
Net earnings for year		152,515.56
		$293,832.86
Interest on debentures		10,215.00
Written off steamboats		9,725.33
Appropriated for renewals and betterments		60,000.00
Dividend 4% paid July 3, 1911	$28,068.00	
Dividend 4%, payable Jan. 3, 1912	28,068.00	
		56,136.00
Balance carried forward		157,756.53
		$293,832.86

Sir Edmund Osler, President, who occupied the chair, said that of the 1,002 new shares offered to shareholders, all but 18 had been subscribed for. In regard to the increase of capital proposed, he pointed out that of $1,000,000 capital stock authorized $701,700 was subscribed and paid up. The issue of 1,981 shares to pay for the Hamilton Steamboat Co. and the Turbine Steamship Co.'s properties would absorb $198,100, and the issue of 1,002 shares to shareholders, amounting to $100,200, brought the total up to $1,000,000, so that it was most desirable to increase the capital. He thought navigation companies should have no liabilities to the public. It was not proposed to issue the whole of the new capital stock suggested until it became necessary to do so, but it would be issued as required to pay off the debentures outstanding, $227,000, and the mortgage on the Yonge St. dock property, $63,500, due Dec. 5 next. It had become necessary to build another steamboat for the Toronto-Niagara-Lewiston run, to cope with the increased traffic offering, which would cost about $350,000.

The report was unanimously adopted, as also was a resolution confirming the purchase of the Hamilton and Turbine Companies, and a bylaw authorizing the increase of the capital stock to $3,000,000.

The directors who were re-elected for the current year, are: President, Sir Edmund Osler; Vice President, Barlow Cumberland; other directors, Hon. J. J. Foy, Hon. J. S. Hendrie, J. Bruce Macdonald, W. D. Matthews, F. G. Osler.

W. D. Matthews, in response to another shareholder, said the directors hoped to be able to increase the dividend to 10% in the not distant future.

As above mentioned, the Hamilton and Turbine companies' properties were bought for $122,660 cash and 1,981 Niagara Navigation Co. shares. The market price of these shares at the time of the transfer was 148, or $293,188 for the 1,981 shares, which would make the total consideration for the properties, which J. C. Eaton receives, $415,848.

Application has been made to the Dominion Government for the necessary power to increase the capital stock to $3,000,000.

It is not expected that the Chicora will go on the Toronto-Niagara route at all this year, that service being performed by the Corona, Chippewa and Cayuga. The Toronto-Hamilton route will probably be opened by the Macassa as usual, the Modjeska and Turbinia going on later. When the excursion season opens the Macassa will be run between Toronto and Olcott, N.Y., the Chicora going on the Toronto-Hamilton route.

During Nov., 1911, seventeen employes were killed and seven were injured in the course of their work in connection with the navigation of Canadian waters. Of the fatalities, 12 were due to drowning, two to crushing, two to falls and one to machinery.

The Canadian section of the International Waterways Commission, consisting of T. C. Casgrain, H. A. Powell and C. A. Magrath, held its first meeting, at Ottawa, Jan. 3. L. J. Burpee, heretofore librarian of the Ottawa Public Library, has been appointed Secretary, vice T. Cote.

Dr. H. T. Barnes, Professor of Physics, McGill University, gave an address to the Canadian Club at Montreal, recently, on the ice conditions in the St. Lawrence River. He said that after giving many years to the study of the subject, he believed, with modern ice breakers of the Russian type, the channel could be kept open from Quebec to Montreal all the winter. He also stated that the Government should be encouraged by public opinion to keep the channel open, thus prolonging the season of navigation, preventing the spring floods, and clearing the city's waste, which is allowed to accumulate near the city all the winter.

List of Steam Vessels Registered in Canada during December, 1911

Name	No.	Where and When Built.	Engines, etc.	Length	Breadth	Depth	Gross Tons	Reg. Tons	Port of Registry	Owners
Adelia S.	130,538	St. Gabriel de Brandon, 1911	Screw 1½n. h. p.	51 0	11 3	3 2	19	13	Montreal	St. Gabriel Lumber Co., Montreal.
Halifax	129,590	Old Kilpatrick, Scotland, '11	" 23 "	125 1	48 1	12 5	595	268	Halifax, N.S.	Napier and Miller, Old Kilpatrick, Scotland.
*M. T. Co. No. 1.	130,797	Beach, Wash., 1900	" 6 "	46 5	11 6	4 4	20	14	Vancouver, B.C.	Metropole Transportation Co., Vancouver, B.C
Phyllis Williams.	130,274	Selkirk, Man., 1911	" 31 "	103 0	21 5	8 0	164	112	Winnipeg	Lake Winnipeg Shipping Co., Winnipeg.
Princess Alice.	130,609	Wallsend-on-Tyne, Eng. 1911	" 610 "	290 6	46 1	14 3	3099	1904	Victoria, B.C.	Canadian Pacific Ry. Co., Montreal.
Yakithik	126,618	Metlakatla, B.C., 1911	" ½ "	30 6	8 6	4 0	9	6	Prince Rupert, B.C.	J. D. Leighton, M.O., Metlakatla.

*Formerly Celtic.

List of Sailing Vessels and Barges Registered in Canada during December, 1911

Name	No.	Where and When Built	Rig	Length	Breadth	Depth	Reg. Tons	Port of Registry	Owners
Ada D. Bishop	130,501	Shelburne, N.S., 1911	Schr.	97.0	22.6	9.7	93	Shelburne, N.S.	C. F. Bishop, Burin, Nfld.
D. P. Dobbins	126,228	Cleveland, O., 1863	"	164.0	32.0	12.0	421	Sarnia, Ont.	J. MacArtbur, Sarnia, Ont.
Falka	130,734	LaHave, N.S., 1911	"	106.8	26.4	10.5	100	Lnnenburg, N.S.	C. Conrad, M.O., LaHave, N.S.
Fish Seeker	130,654	Caraquet, N.B., 1911	"	40.5	13.5	6.0	20	Chatham, N.B.	G. J. Gallien, Caraquet, N.B.
Gladys E. B	130,584	Tancook, N.S., 1911	"	47.2	13.2	7.0	24	Halifax, N.S.	W. Brown, M.O., Herring Cove, N.S.
Jennie P. S.	130,735	" 1911	"	59.2	14.0	7.6	34	Lunenburg, N.S.	C. Young, M.O., Hacketts Cove, N.S.
K. & W. No. 8	130,796	New Westminster, B.C., 1907.	Barge	64.0	25.8	7.0	97	Vancouver, B.C.	G. C. McKeen, Vancouver, B.C.
Marjorie N Inkpen	130,502	Shelburne, N.S., 1911	Schr.	95.0	22.9	9.8	96	Shelburne, N.S.	E. Inkpen, Burin, Nfld.
Mollie G. Gaskill.	130,427	Campobello, N.B., 1911	"	52.4	16.1	6.6	23	St. Andrews, N.B.	J. E. Gaskill, Grand Manan, N.B.
Muriel E. Winters	130,733	Lunenburg, N.S., 1911	"	106.8	26.3	10.4	100	Lunenburg, N.S.	F. Anderson, Lunenburg, N.S.
No. Forty Five	126,673	Port Arthur, Ont., 1911	Scow	72.0	37.2	13.0	726	Port Arthur, Ont.	Western Dry Dock & Shipbuilding Co. Port Arthur, Ont
No. Forty Six	126,674	" 1911	"	72.0	37.2	13.0	726	"	" " "
V. I. T. No. 1	130,608	Victoria, B.C., 1911	Barge	90.0	32.0	8.2	193	Victoria, B.C.	Vaucouver Island and Towing Co., Victoria, B.C.

Lake Grain Shipments, 1911 Crop.

The following statement, prepared by F. Symes, Acting Grain Inspector, Fort William Ont., shows the bushels of grain shipped from the different elevators at Fort William and Port Arthur of the 1911 crop, from Sept. 1 to close of navigation, 1911, with ports of distination. The last two figures in each column after the period, represent lbs.

Destination	Wheat	Oats	Barley	Flax
CANADIAN PORTS				
Collingwood	230,137.00			
Depot Harbor	284,981.30	280,615.17		
Goderich	3,275,292,30	1,229,871.21	162.555.35	149,747,40
Hamilton		110,699.16		
Kingston	3,560,572.50	1,073,817.00	273,445,08	24,307.12
Montreal	2,246,212,50	872,806.12	26,000.26	65,129.30
Meaford	46,519.50	14,689.24		
Owen Sound	723,611.00	1,264,292 02	175,935.27	
Prescott	27,124.40	20,449.04		
Point Edward	746,816.10	418,474.24	60,755.41	
Port Colborne	3,865,167.20	262,630.20		
Port Stanley	145,901.40	2?,900.00		
Quebec		179,304.01		
Thorold	62,000,00			
Tiffin	4,573,652.40	1,106,042.24	154,432.10	
Victoria Harbor	1,226,393.50	388.648.02		
Walkerville	50,000.00			
	21,067,383.50	7,245,240.31	853,125.03	
FOREIGN PORTS				239.184.26
Buffalo	20,904,275.20	507,562.27	729,502.24	483,437.40
Chicago			56,490.13	
Erie	1,956,011.50			
Port Huron	1,436,788.30			
Totals 1911	45,364,459.30	7,752,803.24	1,639,117.40	722,622.10
" 1910	36,846,758.10	5,763,998.17	862,470.36	2,076,606.45

Following is a list of individual shipments by Canadian vessels of 1911 crop, and comparisons with that for 1910 crop:—

	Wheat.	Oats.	Barley.	Flax.
A. E. Ames	61,000.00	93,870.00		
A. E. McKinistry	193,222.50			63,675.06
Acadian	91,859.50	163,000.00	15,791.33	36,058.44
Advance	74,000.00			
Agawa	570,905.30			
Alberta	126,638.10	119,850.01	33,907.12	
Algonquin	75,232.00	56,000.00	163,957.34	
Arabian	101,167.00			
Assiniboia	25,000.00	463,338.02		
Athabasca	105,973.00	251,019.32	35,939.37	
Beaverton	153,750.10	90,101.00		
Bickerdike	91,666.50	88,614.14	14,909.20	
C. A. Jaques	106,538.10	78,465.20		
Canadian	215,919.10			
Carleton	65,000.00	179,304.01		
City of Hamilton	11,179.40		11,881.23	5,000.00
City of Ottawa		10,000.00		10,000.00
Collingwood	281,931.00	556,340.12		
Corunna	81,000.00			
D. A. Gordon	259,000.00	75,000.00		
Donnacona	145,290.20	51,000.00		
Doric	545,679.10	84,902.21	37,333.12	
Dundee	30,499.20	137,876.12		
Dunelm	123,975.00	165,773.20		
E. B. Osler	1,789,966.50			
Edmonton	231,318.40	95,796.24	24,558.41	*3,964.09
Emperor	1,228,357.20			
Empress of Fort William	620,064.30	55,824.14		
Empress of Midland	208,901.40	163,034.18	17,000.00	
Fairmount	331,743.20		76,376.26	
G. R. Crowe	151,522.40			
Glenellah	165,399.50	47,472.20		
Glenmount	559,822.10		6,501.09	
H. M. Pellatt	53,195.00	72.639.29		26,500.12
Hamonic	20,000.00			
Huronic	30,000.00			
Ionic	104,000.00	117,083.28	25,000.00	
Iroquois	355,101.10	165,337.27		
J. A. McKee	741,372.30	188,008.18	49,955.10	
J. H. Plummer	72,000.00	124,500.00		
Kaministiquia	111,700.00	176,575.24		
Kenora	260,820.00			
Kinmount	428,513.50			
Keewatin	309,614.40	327,772.31	53,088.26	
Leafield	119,300.00			
Manitoba	141,385.10	82,807.04	28,000.00	
Mapleton	244,580.00			
Midland King	888.656.20	72,637.04		
Midland Prince	1,039,705.20			
Midland Queen	65,850.30	120,000.00	6,101.26	
Meaford	414,708.40			
Neebing	299,500.00			
Neepawah	142,136.00	20,000.00		
Nevada	172,200.00			
Newona	911,845.00	105.000.00		
Paliki	110,700.60	59,999.10		
Prince Rupert	20,414.20	81,413.01		
Regina	127,200.00			
Renvoyle	73,473.40	85,695.30	25,000.00	
Rosedale	103,778.40	103,874.24	32,430.44	48,218.40
Rosemount	171.303.20	119,958.20		
Saskatoon	80,000.00			
Scottish Hero	627.153.50	582,790.16	18,460.33	49.731.32
Seguin	104,000.00			
Stormount	319,863.20	127,000.00		
Strathcona	62,000.00	118,594.12		
Tagona	181,790.50			
Turret Cape		153,663.28	85,000.00	
Turret Chief	298.990.50	246,246.06		
Turret Court	432,403.50			
Turret Crown	171,000.00	355,895.00		
W. D. Mathews	937,154.10	286,620.20		

(*Continued on page 98.*)

Notes on the Panama Canal Work and Future Operation.

The original estimated date for the completion of the Panama Canal was Jan. 1, 1915. The work has advanced so rapidly that it has become apparent the canal can be used at least a year earlier than this date. In order to determine the approximate time when shipping could pass through, a board was convened during the past year, composed of those charged with the work in progress and contemplated, and their conclusion is that the canal will be ready by July 1, 1913.

At all of the locks, fender chains are to be placed 500 ft. above and 230 below the upper and lower guard gates. When in use, they will be raised to the surface of the water, forming a barrier to the passage of ships. When it is struck by a vessel, the chain pays out against a resistance provided by hydraulic cylinders. The energy of a 10,000-ton ship moving four miles an hour will be absorbed after it strikes the chain before it reaches the gate.

Contracts for emergency or movable dams to check the outflow of water should the gates be carried away, have been awarded. Studies are being made of an electrical plant for operating the canal after completion. A scheme for lighting the canal has been adopted.

Ships will not pass through the locks under their own power. Each ship will be taken in hand by four powerful electric locomotives, one off each bow and one off each quarter. The locomotives will each weigh 70,000 lbs. They will be driven by electric motors operating gears which will engage a rack rail, and the hawsers from the ship will be attached to the windlasses of the locomotives, which will be provided with friction clutches, that will prevent the drums sustaining a pull of more than 25,000 lbs. The speed of the ships, when in tow of the locomotives, will be not over two miles an hour. The provision of rack rail traction, and the power and number of the locomotives, combined with careful operation, will practically eliminate any risks to the locks during the passage of vessels.

Canadian Notices to Mariners.

The Department of Marine has issued the following:—

128. Dec. 29.—355. Quebec, Gulf of St. Lawrence, Magdalen islands, position of Alright reef bell buoy. 356. Quebec, River St. Lawrence below Quebec, chart of South Traverse issued. 357. Newfoundland, south coast, Fortune bay, Fortune town, range lights established. 358. Newfoundland, east coast, Melrose, Ragged harbor, range lights established. 359. Newfoundland, south coast, Placentia bay, Flat islands, Davis island, light to be established. 360. Newfoundland, outh coast, Fortune bay, Fortune, light established.

129. Dec. 30.—361. Nova Scotia, southwest coast, Cape Sable, intended change in position of southwest ledge gas and whistling buoy. 362. Nova Scotia, south coast, off Bassoon reefs, bell buoy established. 363. Nova Scotia, Cape Breton island, St. Patrick channel, Baddeck harbor, Kidston island, new lighthouses.

1. Jan. 1. 1. General, important notice, true bearings to be introduced.

2. Jan. 10. 2. Nova Scotia, Bay of Fundy, entrance to Digby gut, Point Prim light station, new fog alarm building, change in fog alarm.

3. Jan. 12. 3. British Columbia, Vancouver Island, southeast coast, entrance to Victoria harbor, McLoughlin Point, fog alarm established.

4. Jan. 18.—4. Ontario, Lake Ontario, north side, chart of Presqu'ile bay issued. 5. Ontario, Lake Superior, Michipicoten island, east end, lighthouse established.

(Continued from page 97.)

Wahcondah	229,393.20	.....	.....	.....
Westmount	446,760.20	123,000.00	.....	.....
Wexford	590,828.30	190,037.32	.....	.....
Winona	608,133.20	.....	60,755.41	.....
Yorkton	86,247.40	.....	.....	.....
Totals	21,532,298.20	7,245,240.31	853,125.18	239,184.26 *3,964.09
Totals, foreign, to foreign ports	23,832,161.10	507,562.27	785,992.22	483,437.40
	45,364,459.30	7,752,803.24	1,639,117.40	722,622.10 *3,964.09

*Rye.

Atlantic and Pacific Ocean Marine.

Capt. John Henderson, commander of the Allan Line s.s. Pomeranian, died at sea, Dec. 31, while en route to St. John, N.B.

A press report states that the C.P.R. will probably discontinue its steamship service between Canada and Bristol, Eng., shortly.

The C.P.R. has lowered its third class fare between Antwerp, Belgium and St. John, N.B., by 25 francs, commencing Jan. 1, making it now 175 francs.

J. T. Walsh, Marine Superintendent, C.P.R., Montreal, it is reported, will be appointed harbor master there, commencing his duties May 1, vice James McShanne, who will retire on a pension.

The s.s. Cape Breton has been chartered by Dodwell and Co., to load freight at Vancouver for Japanese and Chinese ports. She was expected to arrive at Vancouver from the Orient at the end of January.

The Canada West India Co., Ltd., recently incorporated with $1,000,000 capital, and office at St. John, N.B., is reported to be negotiating in Great Britain, for the purchase of two fast steamships, equipped with large cold storage facilities, for service between the Maritime Provinces and the West Indies.

The Gulf Transport Line s.s. Inkula, running between Liverpool, Eng., and Galveston, Texas, is to be transferred to the Canadian Mexican Pacific Co.'s service, operating between Vancouver and Salina Cruz, in connection with the Tehuantepec Ry. Both the companies named are controlled by Welsford and Co., Liverpool, Eng.

Sir Donald Mann, Vice President, Canadian Northern Ry., is reported to have said, while in California, recently, that the company would shortly inaugurate a steamship service between Canada, Australia and Oriental ports, in addition to a grain service from the Pacific coast, by way of Vancouver and the Panama Canal. Large vessels, suitable for the grain trade would be built for the service.

Following on the withdrawal of the Weir Line of steamships from the Pacific trade, reported to have been the result of an agreement with the Union Steamship Co. of New Zealand, F. Waterhouse and Co., formerly agents for the Weir Line, have chartered the steamships Belle of Scotland, Strathendrick, Strathairly and Henrik Ibsen for the Australian service, with Vancouver as a port of call.

E. J. M. Nash, representing the Royal Mail Steam Packet Co., visited Vancouver and other coast ports recently to study the possibilities for new trade routes which may be opened up on the completion of the Panama canal. The recent merger of steamship interests in Great Britain places this company at the head of 280 steamships aggregating 1,287,950 tons. The companies merged are the Royal Mail Steam Packet Co., Pacific Mail Steamship Co., Elder Dempster Co., Lamport and Holt and the Union Castle Line.

Sir Wm. Mackenzie, President, Canadian Northern Ry., is reported to have stated in London, Eng., Jan. 4, that the rumored proposal of the U.S. Government to grant a preference to U.S. vessels passing through the Panama Canal, would be resented by Canada, though he was afraid Canada had not looked far enough ahead. Canadians were naturally expecting a further substantial development of their far eastern trade on the opening of the canal, and they desired perfect freedom of navigation to and from their Pacific ports.

D. B. Hanna, Second Vice President, Canadian Northern Steamships, Ltd., who returned to Toronto Jan. 20 from Great Britain, is reported to have stated that one of his objects in going there was to secure additional steamships for the company's service for the forthcoming season, but so far he had been unsuccessful. He endeavored first to purchase suitable vessels, and then to charter them. Negotiations are proceeding for the charter of one vessel. He also said that all accommodation on the Royal George and Royal Edward had been booked up to April.

Furness Withy and Co.'s s.s. Hochelaga, presumably for operation in the Canadian service, was launched at Middlesbrough, Eng., recently. She is of the latest improved type of patent cantilever construction with top side water ballast tanks, built to the highest class of the British Corporation, with a deadweight capacity of about 7,600 tons on a light draught. She will have four holds, all free from obstruction, and will be self-trimming owing to the sloping sides of the top side tanks at each side of the vessel. She will be equipped with triple expansion engines with cylinders 26, 44 and 73 ins. diar., by 48 ins. stroke.

Maritime Province and Newfoundland.

The Dominion Government steamboat Lady Laurier, which struck a shoal in Barrington passage, N.S., Jan. 17, was released Jan. 21 and taken to Halifax for repairs.

The Reid Newfoundland Co. has increased its dry dock and ship repairing facilities at St. John's, Nfld., by the purchase of the Angel Engineering Supply Co.'s marine works.

The Reid Newfoundland Co.'s s.s. Bruce was expected to sail from the Clyde, Scotland, Jan. 20, for St. John's, Nfld. On her arrival she will be run between Port aux Basques, Nfld., and North Sydney, N.S.

The St. John River Dredging and Construction Co. is applying for incorporation, with $50,000 capital, and office at Fredericton, N.B., to own and operate dredges and vessels of all kinds, and to conduct a general dredging business in the province.

The Island Tug Co.'s annual meeting was held at Charlottetown, P.E.I., Jan. 9, when a dividend of 10% was declared for the past year. The following directors were elected:—J. L. McMillan, H. W. Longworth and S. W. Crabbe, replacing F. W. Hynd, F. R. Heartz and T. B. Riley.

With reference to the recent reports that the contract for the proposed works at Courtenay Bay, St. John, had been awarded, and that work would be immediately started, we are officially advised, Jan. 3, that the contract for the harbor improvements there had not then been placed.

C. W. Morse, who was sentenced to 15 years imprisonment some time ago at New York for fraud, and who was connected with the Eastern Steamship Co., operating between St. John, N.B., and Boston, Mass., has been released and the remainder of the sentence commuted on account of ill health.

The Maritime Dredging and Construction Co., Ltd., has been incorporated under the Dominion Companies Act, with $750,000 capital, and office at St. John, N.B., to own and operate dredging and construction plants, and to carry on a general construction business, except the construction of railways, telegraph lines, etc.

Job Bros. and Co., St. John's Nfld., have had built at Rotterdam an auxiliary ship, named Netherton. She is fitted with steel lower masts and bowsprit with gaffs and topmasts of pitch pine. The fore, main and mizzen sails were made in St. John's and shipped to Europe. She is equipped with all the modern appliances for rapid handling of cargo.

At a meeting of the St. Stephen, N.B., board of trade recently, the claims of Oak Point harbor were discussed, and it was agreed that a pamphlet describing them be prepared and sent to all members of Parliament. It is claimed that the natural advantages are greater than in any other harbor on the Atlantic, and that the expenditure of about $2,000,000 would provide all the necessary additional accommodation for large ocean going vessels.

The Eastern Steamship Co., which has operated a line of steamships between St. John and Boston, Mass., for some years has been incorporated with the Metropolitan Steamship Co. and the Maine Steamship Co., under the name of the Eastern Steamship Corporation. The International line, between St. John and Boston direct, and between St. John and Boston, via Lubec, Eastport and Portland, will be operated as the eastern division, and for the purpose of general recognition, the old names will be retained.

Bowring and Co., St. John's, Nfld., and Liverpool, Eng., are having built at Newcastle, Eng., an oil tank steamship to Lloyds 100A1 class on the Isherwood system, three deck rule, with 10 oil compartments and four cofferdams, two pump rooms, and with all necessary equipment for carrying and burning liquid fuel. She will be 420 ft. long, 54½ ft. beam, 32¾ ft. deep, with capacity of 9,300 tons deadweight on 26 ft. draught. She will be equipped with triple expansion engines with cylinders 27 ins., 45 ins., and 75 ins. diar. by 48 ins. stroke, for a speed of 11 knots an hour.

The Renwick Co.'s s.s. Renwick was sunk in collision with the s.s. St. Pierre Miquelon, off Country Harbor, at the end of December. She was owned by the Renwick Co., Toronto, and operated by the Inverness Ry. and Coal Co., and was built at Willington Quay, Eng., in 1890, her dimensions being, length 180 ft., breadth 28.1 ft., depth 13.7 ft.; tonnage, 664 gross, 402 register, and was equipped with engine of 70 n.h.p., driving a screw, and is on the British Register. The s.s. St. Pierre Miquelon was seized at North Sydney, Jan. 2, on a claim of $45,000 made by the Renwick's owners.

The s.s. Turret Bell was offered for sale recently, at Quebec, by order of the Exchequer Court. She was built at Sunderland, Eng., in 1894, and is of the following dimensions,—length 297 ft., breadth 40 ft., depth 21 ft. 7 in.; tonnage, 2,211 register. She is equipped with triple expansion engines with cylinders 22½, 36½ and 60 ins. diar. by 42 ins. stroke, 233 n.h.p., supplied with steam by two Scotch boilers, and has a dead weight capacity of 3,500 tons on a 20 ft. draught. She is registered at Newcastle, Eng., and was sold with all

equipment, etc., in the condition as she lay at Indian Cove, near St. Joseph de Levis, Que.

Province of Quebec Marine.

Hugh A. Allan, Chairman, Allan Line, has sent $500 towards clearing off the debt on the Sailors' Institute at Montreal.

The Quebec Waterways Commission held its first meeting of the year at Quebec, Jan. 3. S. N. Parent, formerly Chairman, National Transcontinental Railway Commission, is Chairman.

The Levis Ferries, Ltd. steamboat Colomb, while running into her wharf at Quebec, Jan. 11, collided with the Quebec and Levis Ferry Co.'s steamboat Queen, causing considerable damage.

The Montreal Harbor Commissioners, accompanied by the harbor officials and a number of guests, made a trip down stream, Jan. 1, on the tug Sir Hugh Allan. This is the first time such a trip has been undertaken on Jan. 1, since 1878.

The Dominion Government steamboat Montcalm left Quebec, Jan. 17, for the annual trip to Seven Islands with passengers and supplies. On her return she will be engaged with the steamboat Lady Grey on ice work in the Cap Rouge channel.

The Montreal Harbor Commissioners have laid before the Minister of Marine plans for an expenditure of $2,000,000 during the forthcoming season. The work proposed covers the completion of the dry dock, new sheds, dredging of the channel and new piers.

The Department of Marine will receive tenders to Feb. 26, for the construction of one or two steel single screw bucket dredges, a steel single screw hopper dredge, one set of compound steam engines, to develop 450 i.h.p. for dredge 37, and fifty steel rock digging buckets with links and pins, all delivered at Sorel.

A meeting of mayors of municipalities on the south shore of the St. Lawrence was held at Levis, Jan. 4, when it was resolved to point out to the Government, that in the event of re-forming the Quebec harbor commission on the same lines as that of Montreal, the south shore municipalities should be represented.

The Richelieu and Ontario Navigation Co., which operates the ferry service from Montreal to Longueuil and Boucherville, ran a special trip on Jan. 1. The regular service closed Dec. 29, finishing the longest navigation season for several years. In 1899, the season was closed on Dec. 30, and in 1881, on Jan. 1, the latter constituting a record.

The Montreal Harbor Commissioners met the city board of control, Jan. 10, to adjust differences regarding the taxation of the commissioners' property. The mayor stated that the right of the municipality to tax the property would have to be settled by the courts, and when this was done, the city would secure such legislation as would enable it to exercise its right without militating against those of the port.

The bill to amend the Quebec Harbor Commissioners Act, recently introduced into the House of Commons by the Minister of Marine, provides for the repeal of secs. 7 to 16 inclusive, and the insertion of new sections to the effect that the commission shall consist of three members appointed by the Governor in Council on the advice of the Minister of Marine, and that they hold office during pleasure; two members shall form a quorum; one of the members may be appointed as president, and each member may be paid out of the harbor revenue, such remuneration as may be determined by the Governor in Council.

Ontario and the Great Lakes.

Capt. R Walton, a well known Great Lakes mariner, died at St. Catharines, Jan. 10.

Capt. C. McDiarmid, a well known lake tug captain, died at Windsor, Jan. 9, aged 55.

Capt. Thos. Horne, for many years a master mariner on the Great Lakes, died in Stamford tp., Jan. 18, aged 86.

The Black Rock Lock at Buffalo, N.Y., which was completed on Dec. 18, is 600 ft. long, 70 ft. wide, 24 ft. deep, and has a lift of 5 ft. There are five pairs of gates.

A survey party is again working on a route for the proposed new Welland canal, from the mouth of Ten Mile Creek, and commenced boring operations at Thorold, early in January.

What is stated to be a record in late navigation on Lake Ontario, took place, Dec. 27, when the sloop Ariadne loaded grain at Kingston and sailed for Stone Mills on the Bay of Quinte.

R. Read, who commanded various schooners on Lake Ontario, in the old sailing days, and who was engaged since 1896 as master of lock 2, Welland canal, died at St. Catharines, Jan. 2.

During 1911 there were 2,574 vessel passages through the Welland canal, the highest number in its history. The fastest trip was made by the steamboat City of Montreal, which took 9 hrs. 20 mins.

The Rainy River Navigation Co. is reported to have entered suit against the Minnesota and Ontario Power Co. for damage suffered owing to the lowering of the water in the lower part of the river.

The Victoria Navigation Co., Ltd., incorporated under the Dominion Companies Act, has been licensed to carry on business in Ontario, utilizing a capital of $50,000 in the province, with J. H. Hall, Ottawa, as its attorney.

It is reported that a floating dry dock will shortly be built at Port Stanley, with proper facilities for repairing all vessels coming to the port. O. C. Smith is stated to be interested in the project, together with the Tug Owners' Association.

The Montreal, Ottawa and Georgian Bay Canal Co. is applying to Parliament for an extension of time, to May 1, 1914, for the commencement of construction and for the expenditure of $50,000 on such work, and to May 1, 1920, for the completion of the canals.

The steamboat John Sharples, which ran aground in lower Lake Ontario in the winter of 1910-11, and was subsequently abandoned to the underwriters, was sold recently to the Reid Wrecking Co., Sarnia. She is now at Port Huron, Mich., where she will be repaired.

The Northern Michigan Transportation Co., of Chicago, Ill., is arranging for the operation of its steamboat Missouri, via Mackinac, to Collingwood, calling at intermediate ports, next season. The Goodrich Steamship Co., Chicago, Ill., will also, probably put its steamboat Arizona on the same route.

The Toronto Harbor Commission held its inaugural meeting, Jan. 4, when the transfer of the Ashbridge Bay property from the city was formally made. E. L. Cousins, who has been in charge of the city of Toronto's bridge and railway work for some time, has been appointed Engineer for the Commission.

The Pelee Sand and Gravel Co. recently organized in Cleveland, Ohio, is reported to have contracted for a steamboat to ply between Point Pelee, Lake Erie and south shore points. It is said the boat will be built at Cleveland, and that she will cost $80,000, and will be equipped with a self-unloading device, electric generating plant and other modern machinery. The contract calls for delivery early in May.

The Great Waterways Union of Canada has been formed at Berlin, Ont., to inaugurate a campaign to hasten with all possible speed, the development by the Dominion Government of an ocean waterway to the head of the lakes, by way of the St. Lawrence river and the Welland canal, and to urge the Government not to proceed with the proposed Georgian Bay project, without having first conducted the most complete investigation as to its feasibility.

A. St. Laurent, Assistant Deputy Minister of Public Works, accompanied by C. R. Coutlee, Assistant Engineer of the work in connection with the proposed Georgian Bay canal, are visiting the Panama canal works with the view of obtaining information which may be of use in connection with the Georgian Bay operations. Their return is expected in February, when a report will be prepared for submission to the Department.

The U.S. Lake Survey reports the levels of the Great Lakes, in feet above tidewater, for December, 1911, as follows,—Superior, 601.88; Michigan and Huron, 579.46; Erie, 571.46; Ontario, 244.63. As compared with the average December levels for the past ten years, Superior was 0.56 ft. below; Michigan and Huron, 0.77 ft. below; Erie, 0.2 ft. below, and Ontario, 0.74 ft. below. It was anticipated that during January, Superior would fall 0.3 ft.; Michigan and Huron, 0.1 ft., and that Erie and Ontario would remain stationary.

The proposal to establish a dry dock at Owen Sound, which was submitted to the local council about two years ago, and for which the taxpayers had voted a subsidy of $50,000, was again introduced, Jan. 20, in amended form. The new proposal covers a much larger scheme than was at first contemplated, involving an expenditure of about $1,500,000. The plans will be considered by the town council, and it is proposed to ask the town to take $50,000 of stock and grant an annual bonus of $10,000 for 20 years.

Jas. Playfair, President, Inland Lines, Ltd., is reported to have stated recently that the Northern Navigation Co.'s steamboat Huronic would not be lengthened during this winter, as at first intended, as it would not be possible to have her ready for the spring service. Some repair work would, however, be undertaken, chiefly to her keel. He also stated that tenders would be invited shortly for the construction of another vessel as soon as the plans were decided on. The new vessel would be the flag ship of the fleet.

A bill which was recently introduced into the House of Commons, providing for the incorporation of the Hamilton Harbor Commission, defines the port and harbor of Hamilton as including Burlington Bay and Cootes Paradise, with all the inlets, dock and other water front property, water lots, piers, shores and beaches along the bay. It is desired that the commission shall consist of three members, two being appointed by the Governor in Council and one by the city on the nomination of the board of control. The appointment to be for three years, each being eligible for re-appointment; two members shall form a quorum, and the members shall elect their own chairman and appoint all officers.

An Ottawa dispatch of Jan. 22 says: "The Government engineers have completed the surveys of the Welland canal and their report with recommendations will be submitted to the Government very shortly. It is believed that the Government is favorably inclined to the proposition to rebuild the canal, and it is rumored that there will be an appropriation to start work in the supple-

mentary estimates. Four routes have been suggested by the engineers. One is from Nioyin Point to Jordan, which would mean an entirely new project. The second is a division of the present canal from Welland to 15-mile creek on Lake Ontario. The third diverts the canal from a point south of Thorold to Port Dalhousie, while the fourth proposed division would end at Ten Mile Creek."

The Dominion Government has decided to abandon the work on the Newmarket canal, which was intended to form a water route between Newmarket and Lake Simcoe, by way of the Holland river. The work was commenced in 1908, on an original estimate of $328,000, and in March, 1911, a final estimate of $1,000,000 was submitted to Parliament, and a statement that $459,832 had been spent to Mar. 31. The work was divided into two sections, section 1 being from Cook's Bay, Lake Simcoe, to Holland Landing, on the east branch of the Holland river, and section 2 extending from that point to Newmarket, 4⅛ miles. The rise from start to finish was 43 ft., which was overcome by three locks. Lock and dam no. 3 are finished and about 60% of lock and dam no. 2, the excavation for lock no. 1 being partly done, as is also the dock at Newmarket. When completed, some time in 1913, it was intended that the work should form part of the Trent Valley canal system, connecting Lake Simcoe and the Georgian Bay, which latter work, it is reported, is also to be abandoned.

Manitoba, Saskatchewan and Alberta.

It is reported that efforts are being made to get the Government to erect wireless telegraph stations on Lake Winnipeg, for the benefit of navigation, and to extend the telephone system from Icelandic River to the north end of Big Island.

The U.S. Congress is being asked to order a new survey of the Red River, from Fargo, N.D., to the Canadian boundary, with the view of creating a 12 ft. channel, and the ultimate establishment of a through waterway from Fargo to Hudson Bay. It is stated that a navigable waterway can be made by the construction of two, or more, dams, and that with the improvements contemplated by the Dominion Government, a feasible route can be made, by way of the Nelson River and the northern outlet of Lake Winnipeg.

British Columbia and Pacific Coast Marine.

The C.P.R. s.s. Princess Adelaide was taken out of service, Jan. 2, and sent to Seattle, Wash., where oil-burning apparatus was installed.

The C.P.R. s.s. Amur has been sold to the Coastwise Barge Co., Seattle, Wash., to carry ore from Howe Sound, B.C., to Tacoma, Wash.

The North Vancouver ferry steamboats are to be converted into oil burners. It is estimated that this will save about $8,000 a year.

The C.P.R. s.s. Princess Beatrice, which ran aground on Noble Island, Nov. 14, 1911, has been repaired, and again placed in service on the Queen Charlotte Islands run.

Representations from the Yukon territory are being made to the Dominion Government on the question of securing a seaport. It is suggested that negotiations be opened with the United States, with a view to securing a port on the Lynn canal, either by purchase or exchange.

The Canadian Fish and Cold Storage Co., Ltd., recently incorporated with $1,500,000 capital and office at Prince Rupert, is inviting tenders in England for building 16 halibut fishing steamers for use in northern waters this year. A cold storage plant is being erected at Prince Rupert.

C. D. Swan, Government engineer, appointed to report on the proposed harbor improvement scheme at Vancouver, has completed his general inspection, and has left for Europe, where he will inspect various harbors with a view to adopting the latest improvements in a scheme which he will submit in a report on his return.

The C.P.R. s.s. Princess Sophia, which has been built at Paisley, Scotland, is reported to be practically ready for dispatch to the Pacific coast, and she is expected to sail from the Clyde early in February. She is 245 ft. long, 44 ft. beam and 18 ft. deep, and is equipped with triple expansion engines, with boilers and furnaces fitted for either coal or oil fuel.

The turbine s.s. Queen Alexandra, which the C.P.R. recently purchased in Glasgow, Scotland, for its Vancouver, Nanaimo and Comox service, and which was illustrated in our last issue, has been thoroughly overhauled, repaired and altered to make it suitable for its new service, and has been re-named Princess Patricia, after the daughter of H.R.H. the Governor General. The vessel sailed from the Clyde, Jan. 5, for Vancouver, by way of Cape Horn.

With reference to the steamboat which the British Columbia Express Co. is building for operation between Tete Jaune Cache and Fort George, of which mention was made in our last issue, we are advised that it will be 118 ft. long by 24½ ft. beam, arranged for large power on a light draught. The estimated cost is $50,000. She will run as fast mail, passenger and freight steamboat, and will extend the company's system, so that connections can be made between Ashcroft on the C.P.R. and Tete Jaune Cache, the head of navigation on the Fraser River.

The Shipowners' Association of British Columbia is taking up the question of improving the acommodation of, and approaches to False Creek, Vancouver, including the deepening of the channel, the construction of a Government wharf east of the Granville St. bridge, and a protest against the proposed filling in of a large area there, and the use of the Government dredge Mastodon, in doing any dredging work in connection with the Vancouver, Victoria and Eastern Ry. and Navigation Co.'s improvements, prior to the completion of all dredging work which has been outlined for the general benefit of the port.

The Union Steamship of British Columbia has awarded a contract for extensions to its Vancouver dock, to O'Brien, McCaughey and Lemcke, Seattle, Wash. An office is to be opened by the contractors in Vancouver, and the contract provides for the employment of Vancouver labor and the purchase locally of all material with the exception of creosoted piling. The contract for the shore end improvements has been let to Ironsides, Rannie and Campbell, and that for the office building to J. McNee, Vancouver. Plans for additional extensions to the dock will be further considered in the spring, when J. H. Welsford, President, is due from England for a general inspection of the company's properties.

The C.P.R. s.s. Princess Alice, which arrived at Victoria, recently, was built in England. Her machinery consists of triple expansion engines, with cylinders 27, 42, and 48½ ins. diar. by 39 ins. stroke, supplied with steam by four Scotch boilers, 15.7 ft. outside diameter, by 12 ft. long, with three Morison furnaces, 49 ins. diar. There is a total grate area of 330 sq. ft., and a heating surface of 10,900 sq. ft. The engines are of 4,390 i.h.p., and are equipped with oil burning apparatus. On her recent trials on a boiler pressure of about 180 lbs. per sq. in., an average of 155 revs. per minute was attained, with an average horse power, for four hours, of 4,280, on a mean draught of 14 ft. 2 ins., making close to 18 knots an hour in a heavy swell.

It is announced that, following the recent visit of C. E. E. Ussher, Passenger Traffic Manager, C.P.R., to the Pacific coast, the C.P.R. will, on May 1, inaugurate a steamship service between Victoria and Tacoma, Wash., leaving Victoria daily at 9 a.m. and Tacoma at 8 p.m. It is stated that the service will be more of an experimental nature, to see if there is sufficient passenger traffic available to justify the service, and if so, it will become permanent.

Twohy Bros., Ashcroft, B.C., who have a contract for the construction of a portion of the Canadian Northern Pacific Ry., are having built at Kamloops a stern wheel steamboat to run on the North Thompson River, for about 100 miles north of Kamloops, or as far as it will permit of navigation. She will be 140 ft. long, 34 ft. beam and about 30 ins. draught, equipped with engine having cylinder 15 ins. diar. by 72 ins. stroke, of 600 h.p. She will be used chiefly for carrying supplies, but will also operate in the passenger trade.

Coasting Regulations for Foreign Vessels

The regulations permitting foreign vessels to carry on a coasting trade in Canada were contained in an order in council of Dec. 17, 1908, and amended, Dec. 28, 1908, being published in our issues of Jan. and Feb., 1909. A further order in council has been made, as follows:—

Steamships of not less than 1,500 tons gross tonnage, each, of the following countries, Italy, Germany, the Netherlands, Sweden, Norway, Austro-Hungary, Denmark, Belgium, the Argentine Republic and Japan, shall be admitted to the coasting trade of Canada in the carrying of goods and passengers coastwise between any port in the province of Nova Scotia and any port in the province of Quebec, and vice versa, on the same terms and conditions as are applicable to Canadian vessels, until Dec. 31, 1913.

Muskoka Lakes Navigation and Hotel Co.—At the annual meeting in Toronto recently a number of changes were made in the board, J. S. Playfair, who has been President for several years, retiring. The directors for the current year, all of whom live in Toronto, are:—President, H. C. MacLean; Vice Presidents, G. T. Somers and W. W. George; other directors, R. S. Wilson, F. F. Brintnell, and A. McLean Macdonell, K.C. The Manager and Treasurer is W. F. Wasley, and the Manager of the Royal Muskoka Hotel is L. W. Maxson.

D. H. Bowen, who has been appointed Assistant Superintendent, C.P.R. Telegraphs, Ontario Division, Toronto, was presented with $500 by local business men on his leaving London, Ont., where he had been local manager for the company.

The Board of Railway Commissioners has passed the following order 15559, to which reference was made in our last issue:—"The application of express companies operating in Canada and subject to the Board's jurisdiction, for approval of their standard tariffs, and the Board's judgment of Dec. 24, 1910. It is ordered that the time allowed for the said judgment for the free return of empty packages carried full by the express companies prior to Mar. 1, 1911, be extended to Nov. 1, 1912."

St. Lawrence & Chicago Steam Navigation Co.'s Annual Meeting.

Following are extracts from the report for the year 1911, presented at the annual meeting in Toronto, Jan. 10:—

The season of 1911 was not generally a very profitable one to vessel interests. A large number of freight steamships usually employed on the lakes were laid up on account of inability to secure profitable cargoes. Your steamships, however, have been kept regularly employed, although at low rates, but the increased rates prevailing in November gave a fair profit, making the season's business on the whole fairly satisfactory, and the prospect of increased business in 1912 gives some encouragement for the future.

Acting on the authority granted at the last annual meeting, your directors insured a proportion of the risk on the steamships under a modified form of policy at a reduced rate, and as our steamships had no accidents, nor required docking during the season, we have saved a large sum, which, added to our insurance fund, makes the total at credit of that fund now $53,802.30, and it is the intention of your directors to continue the same policy, unless insurance rates are reduced to a reasonable basis.

The directors from the earnings of the season have paid a dividend of 5%, and, after providing for same, have carried forward $5,433.63 to the credit of profit and loss, making a balance at credit of that account of $141,476.72.

ASSETS.

Five steamships, viz.: Algonquin, Iroquois, W. D. Matthews, G. R. Crowe, E. B. Osler	$1,000,000.00
Freights and accounts receivable	17,786.22
Balance in bank	37,584.80
	$1,055,371.02

LIABILITIES.

Capital stock	$ 860,000.00
Accounts payable	92.00
Insurance fund	53,802.30
Balance of profit and loss carried forward	141.476.72
	$1,055,371.02

PROFIT AND LOSS ACCOUNT.

Balance brought forward, Jan. 3, 1911		$136,042.89
Steamships' earnings	$62,210.74	
Interest	456.85	
		62,667.59
Cost of management, viz.: salaries, taxes, office rent, directors and auditors' fees, etc.		$ 14,233.76
Dividend 5%, payable Jan. 2, 1912.		43.000.00
Balance carried forward		141.476.72
		$198,710.48

The directors, who were re-elected for the current year, are:—President, W. D. Matthews; Vice President and Secretary, J. H. G. Hagarty; Managing Director, A. A. Wright; other directors, Jas. Carruthers, Capt. S. Crangle, G. R. Crowe, C. S. Gzowski, Sir Edmund Osler.

Vessels Removed from the Register.

The following vessels were removed from the Canadian register during December, 1911, for the reasons assigned:—Steam—Athens, Victoria, B.C., 8 tons, stranded; Bonanza, Vancouver, B.C., 74 tions, sunk; Circassian, Ottawa, 5 tons, out of existence; Clipper, Ottawa, 3 tons, out of existence; D. W. Gordon, Victoria, B.C., 6 tons, burnt; Eva, Montreal, 4 tons, burnt; Eva, Port Hope, Ont., 12 tons, burnt; Eva Belle, Collingwood, Ont., 7 tons, burnt 15 years as Evangeline, Montreal, 16 tons, burnt; Elswood, Kingston, Ont., 17 tons, out of existence; Fern, Vancouver, B.C., 17 tons, burnt; Governor Morton, Port Stanley, Ont., 10 tons, burnt; Grenada, Prescott, Ont., 43 tons, broken up; Harvey Neelon, St. Catharines, Ont., 47 tons, burnt; Helen, Goderich, Ont., 3 tons, out of existence; Help, Liverpool, N.S., 78 tons, stranded; Ida, Quebec, 9 tons, broken up; Irene, Ottawa, 2 tons, out of existence; Iroquois, Victoria, B.C., 94 tons, foundered; Janet Craig, Ottawa, 6 tons, out of existence; John McDonald, Ottawa, 16 tons, out of existence; Juno, Ottawa, 8 tons, broken up; Kate, Sault Ste. Marie, Ont., 30 tons, burnt; Kate Marks, Sault Ste. Marie, Ont., 43 tons, abandoned as worthless in 1900; Lady Dufferin, Chatham, N.B., 29 tons, broken up; Little Jem, Port Dover, Ont., 2 tons, out of existence; Lizzie, Ottawa, 1 ton, out of existence; Lothair, Port Hope, Ont., 281 tons, out of existence; Marina, Yarmouth, N.S., 16 tons, stranded; North America, Charlottetown, P.E.I., 99 tons, wrecked; Petrel, Winnipeg, 94 tons, wrecked; Plover, Montreal, 27 tons, broken up; R-Tis-3, Charlottetown, P.E.I., condemned; Wasaga, Collingwood, Ont., 1108 tons, burnt. Sailing—A. Gauthier, Ottawa, 137 tons, out of existence; Colborne, Montreal, 302 tons, broken up; Ethel Aggie, Charlottetown, P.E.I., 48 tons, wrecked; Germainne, Montreal, 87 tons, broken up; Hattie Muriel, St. John, N.B., 85 tons, wrecked; Jubilee, Charlottetown, P.E.I., 76 tons, sold to foreigners; Julie Plant, Lunenburg, N.S., 62 tons, broken up; Loyal, Lunenburg, N.S., 99 tons, stranded; Marconi, Liverpool, N.S., 199 tons, abandoned at sea; Margaret S., Lunenburg, N.S., 63 tons, transferred to Newfoundland; Marguerite, Yarmouth, N.S., 57 tons, broken up; Maria, Chatham, N.B., 28 tons, lost; Muriel, Lunenburg, N.S., 110 tons, stranded; Nahada, Lunenburg, N.S., 94 tons, transferred to Newfoundland; Naiad, Sarnia, Ont., 276 tons, abandoned; R. W. Smith, Lunenburg, N.S., 74 tons, broken up; Reliance, Shelburne, N.S., 192 tons, wrecked; Renown, Lunenburg, N.S., 79 tons, lost at sea; St. Patrick, Halifax, N.S., 27 tons, wrecked; Scud, St. John, N.B., 56 tons, broken up; Sweet Marie, Charlottetown, P.E.I., 77 tons, wrecked.

TENDERS.

SEPARATE TENDERS addressed to the undersigned, at Ottawa, and endorsed on the envelope either "Tender for Bucket Dredgers," "Tender for Hopper Barge," "Tender for Compound Engines," or "Tender for Dredge Buckets, etc.," will be received up to noon of the Twenty-sixth day of February, 1912, for the following:—1. The construction of one or two Steel Single Screw Bucket Dredgers, to be delivered at Sorel. 2. The construction of a Steel Single Screw Hopper Barge, to be delivered at Sorel. 3. The construction of one set of Compound Steam Engines to develop 450 indicated horse-power for dredge No. 37, to be delivered at Sorel. 4. The furnishing of fifty Steel Rock Digging Buckets, Cast Steel Links and Manganese Bucket Pins, to be delivered at Sorel. Tenders may be submitted for one or all of the four items, but in any case a separate tender must be submitted for each item indicated above.

Full information and specifications in connection with the above can be procured on application from the Purchasing and Contract Agent, Department of Marine and Fisheries, Ottawa. There are no special tender forms in connection with this work. Each tender must be accompanied by an accepted bank cheque in favor of the Deputy Minister of Marine and Fisheries equal to ten per cent. (10 p.c.) of the value of the item or items tendered on, which cheque will be forfeited if the successful tenderer declines to enter into a contract with the Department or fails to complete the work contracted for in accordance with the contract to be prepared by the Department. Cheques accompanying unsuccessful tenders will be returned. The Department does not bind itself to accept the lowest or any tender. Newspapers inserting this advertisement without authority will not be paid for same.

ALEXANDER JOHNSTON,
Deputy Minister of Marine and Fisheries.

Among the Express Companies.

R. Paton McLea, of Montreal, has been elected Vice President, Dominion Ex. Co., to succeed the late C. F. Smith.

The Board of Railway Commissioners has fixed the collection and delivery limits for express companies in Brighton, Ont., and Strathcona, Alta.

The Canadian Northern Ex. Co. has opened an office at Fork River, Man., and has closed its offices at Belleview, Man., and Carlsberg, Sask.

C. Powers, a Canadian Ex. Co. driver and messenger at Winnipeg, was arrested recently on a charge of theft of $10,000. He claims that he was made intoxicated by two men and robbed.

The charges against J. D. Chilman and J. Acheson, of robbing the Canadian Ex. Co.'s office at Hamilton, Ont., of about $8,000, were heard Jan. 14. The latter was acquitted, and the former found guilty of receiving part of the proceeds, and sentenced to one years imprisonment.

The Board of Railway Commissioners on Jan. 10, ordered the Canadian Ex. Co. to file, before Jan. 25, a tariff abolishing the extra charge between Pictou, N.S., and Charlottetown, P.E.I., except when it may be necessary, owing to weather conditions, for traffic to be carried to Georgetown, P.E.I.

The Canadian Ex. Co., Jan. 15, commenced operating over the Temiskaming and Northern Ontario Ry., between North Bay and Cochrane, and has opened offices, with regular agents, at Cobalt, Charlton, Cochrane, Dane, Diver, Earlton, Englehart, Gillies Depot, Haileybury, Heaslip, Iroquois Falls, Latchford, Matheson, Mulock, New Liskeard, North Cobalt, Porcupine, South Porcupine, Swastika, Thornton, Tomiko, Timagami, Uno Park, and Widdifield. Arrangements have also been made to handle traffic for Elk Lake, via stage from Charlton, in the winter, and by boat and stage from Latchford in the summer.

The Dominion Ex. Co., in connection with the recent order of the Board of Railway Commissioners as to the free return of empty packages, quoted on another page, has issued instructions to its agents, pointing out that empties which have been forwarded full over the company's system, and entitled to free return under the classification effective prior to Mar. 1, 1911, and outstanding at that date, may be returned free until Nov. 1, 1912, provided that each shipper entitled to free return of such empties, files with the company a statement showing the dates the full packages were shipped, to what points, the names of the persons, and the number of packages, which must be verified by the agent from his books.

Telegraph and Cable Matters.

The C.P.R. has erected a duplicate wire between Merritt and Vancouver, B.C.

The Canadian Northern Telegraph Co. has closed its office at Carlsberg, Sask.

E. Rawlings, director, Montreal Telegraph Co., died in Montreal, recently, aged 72.

The Board of Railway Commissioners commenced its enquiry into the question of telegraph tolls, at Ottawa, Jan. 8.

J. A. Wisely, heretofore chief operator, has been appointed local manager, C.P.R. Telegraphs, Halifax, N.S., vice W. M. Godsoe, promoted.

L. H. McNamara, publisher of the Bruce Herald, has been appointed agent, Great North Western Telegraph Co., Walkerton, Ont., succeeding his father, M. McNamara, deceased.

C. W. MacDonald, heretofore assistant night chief operator, C.P.R. Telegraphs, Toronto, has been appointed local manager at London, Ont., vice D. H. Bowen, appointed Assistant Superintendent, Ontario Division, Toronto.

D. H. Bowen, heretofore local manager, C.P.R. Telegraphs, London, Ont., has been appointed Assistant Superintendent, Ontario Division. Office, Toronto. He entered the C.P.R. Telegraph service Oct. 1, 1886, as agent at St. Thomas, Ont., and was appointed local manager at London, Ont., Apr. 23, 1890.

J. F. Richardson, whose appointment as Superintendent, C.P.R. Telegraphs, British Columbia Division, Vancouver, was announced in our last issue, was presented with a purse of gold, by the staffs at Montreal, Ottawa and Quebec, on his transfer from the position of Superintendent, Eastern Division, Montreal.

The Pacific Cable Board's new cable, which is to be laid between Australia and New Zealand, will cost about $875,000, which will be taken from the Board's reserve fund. The cable will be laid between Sydney and Auckland, and it is stated that the Board's headquarters in New Zealand will be moved to Auckland with the view of giving a speedier service.

W. M. Godsoe, who has been appointed Superintendent, Atlantic Division, C.P.R. Telegraphs, St. John, N.B., was born there, and entered the service there in May, 1895, being transferred to Halifax, N.S., in May, 1896. He was subsequently appointed chief operator there, and in May, 1902, Manager. On leaving Halifax, recently, to take up his new position, he was presented by the staff and personal friends, with a gold chain and engraved locket, and fitted travelling suit case.

The Maritime Telegraph and Telephone Co., which recently absorbed the Nova Scotia Telephone Co., has completely reorganized its staff, and contemplates making a number of improvements in the service. The present officers and directors are: President, S. M. Brookfield; Vice President, O. E. Smith; directors, M. Dwyer, H. R. Silver, Hon. B. F. Pearson, R. E. Harris, J. R. McLeod, Halifax, N.S., and C. F. Sise, Jr., and L. B. Macfarlane, Montreal. The annual meeting will be held in February.

The following changes of C.P.R. Telegraph officials in the Manitoba Division, J. McMillan, Superintendent, are reported:—W. R. Rutherford, heretofore local manager, Winnipeg, appointed supervisor at Souris; W. D. Neil, heretofore chief clerk to Superintendent, Alberta Division, Calgary, appointed local manager, Winnipeg, vice W. R. Rutherford; W. Kennedy, heretofore agent at Regina, Sask., appointed assistant city representative, Winnipeg; W. K. Thompson, heretofore agent at Saskatoon, Sask., appointed chief operator, Winnipeg, vice W. J. Kane; W. J. Kane, heretofore chief operator, appointed supervisor, Winnipeg.

The following changes of C.P.R. telegraph officials are announced, in addition to those mentioned in our last issue:—W. J. Camp, heretofore Electrical Engineer, has been appointed Assistant Manager, Office, Montreal. J. Fletcher, heretofore Superintendent, British Columbia Division, Vancouver, has been appointed Superintendent of Traffic, Office, Montreal. W. M. Godsoe, heretofore local manager, Halifax, N.S., has been appointed Superintendent, Atlantic Division, vice F. J. Mahon, transferred to Montreal, Office, St. John, N.B. D. H. Bowen, heretofore local manager, London, Ont., has been appointed Assistant Superintendent, Ontario Division, Office, Toronto.

The Montreal Telegraph Co.'s report, which was presented at the annual meeting in Montreal, Jan. 11, shows assets of $2,293,724.72. The capital is $2,000,000, and the excess in value of property operated by the Great North Western Telegraph Co. over shareholders' capital is $151,823.85; dividend paid Jan. 15, $40,000; unclaimed dividends, $938.76, and contingent fund, $100,962.11. The system is operated by the G.N.W. Telegraph Co., and its operation and maintenance are guaranteed by the Western Union Telegraph Co., for 97 years from July 1, 1881. The total distribution to shareholders during 1911, comprising dividends and bonuses, was $165,000. B. McLennan and R. MacD. Paterson were elected directors, succeeding H. A. Allan, resigned, and E. Rawlings, deceased.

In giving evidence before the Board of Railway Commissioners, Jan. 11, in the enquiry into telegraph tolls generally, W. J. Camp, Assistant Manager, C.P.R. Telegraphs, is reported to have stated that the total cost of the company's telegraph system, exclusive of freight charges on the material from point of origin to destinations, was $6,696,421.40, of which $3,897,238 was for pole line equipment. This was spread over 12,108 miles of poles, making the average cost per mile, $321.87. The cost of wires was given as $2,190,988, and cables $275,044, the balance being for batteries, instruments, etc. It was also stated that there were 75,782 miles of wire along the right of way, 49,936 miles of this being exclusively commercial, 5,201 exclusively railway, and 20,735 joint railway and commercial. Of the total, 21¾% was given as railway line and 78¼% as commercial, and on that basis it was estimated that $1,204,267.81 value of the plant was devoted to railway use exclusively, and $5,492,153 to commercial use. The whole telegraph system of the company is estimated to be worth $6,156,168.

The Safety Car Heating and Lighting Co., New York and Montreal, has been advised by Julius Pintsch Aktiengesellschaft, Berlin, that the Prussian Minister of Public Works Von Breitenbach, has denied a report, published in various European journals, that by action of the Reichstag at Berlin, the Prussian State Railways were to be equipped with electric light. This denial by the Minister over his signature refutes any contemplated change from gas to electricity as an illuminant on the Prussian State Railways.

NOTICE is hereby given that an application will be made by the Toronto Suburban Railway Company to the Legislature of the Province of Ontario at its next session for an Act authorizing the company:

(a) To extend its line from some point at or near Guelph, in the County of Wellington, to some point at or near Berlin, Preston, Hespeler and Galt, in the County of Waterloo, and thence to a point at or near Hamilton, in the County of Wentworth, passing through or near the Townships of Guelph, Waterloo, Dumfries, Puslinch, Beverley, Flamboro West, and Ancaster.

(b) To amend Section One of the Statutes of 1910 by inserting after the words "County of Peel," in the fourth line thereof the words "or from some point on its authorized Hamilton line at or near Cooksville, in the County of Peel."

(c) To increase the capital stock, to authorize the issue of bonds or debenture stock for terminals, bridges, station-houses, electrical generating plants and the appurtenances thereto, and all other electrical equipment necessary for the purposes of the company.

(d) To extend the time for the commencement and completion of the company's railways and for other purposes.

Dated at Toronto, this 27th day of December, 1911.

ROYCE & HENDERSON,
Traders Bank Building, Toronto.
Solicitors for the Toronto Suburban Railway Company.

TRADE AND SUPPLY NOTES.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time we wish our readers to distinctly understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

Calendars for 1912 have been received from Dearborn Drug and Chemical Works, Chicago; Mussens, Ltd., F. H. Hopkins and Co., Montreal; Baldwin Locomotive Works, Philadelphia.

Kennedy and MacDonald, Edmundston, N.B., who have a contract on the National Transcontinental Ry., are having three locomotives completely overhauled by the Robb Engineering Co., Amherst, N.S.

The Steel Co. of Canada has let contracts for two new open hearth furnaces of 50 tons capacity each, a blooming mill, a continuous billet mill, and a combination rod and bar mill to be built at Hamilton, Ont.

The Robb Engineering Co., Amherst, N.S., has received an order to install in a factory being built by Moirs, Limited, at Halifax, N.S., a 200 h.p. Robb-Mumford internally fired boiler, to be operated at 150 lbs. working pressure, and a 150 k.w. generator driven by a Robb-Armstrong automatic Corliss engine of the side crank type.

J. J. Gartshore, 58 Front St. West, Toronto, has purchased the material on the Opeongo Logging Railway at Whitney, Ont., in consequence of the line being taken up, as the Ontario Government has purchased some of the timber limits in that district and is adding the territory to Algonquin Park. There were a little over 13 miles of track and the rails are in first-class condition for relaying.

Allis-Chalmers-Bullock, Limited, Montreal, is an entirely separate and distinct corporation and is not in any way affected by the receivership proceedings in connection with the United States company. It has not felt adverse conditions similar to those in the U.S.; but, on the contrary, the shops are full of work and running regular time. The proceedings will not affect the operations of the Canadian company in any way.

The Canadian Locomotive Co.'s shareholders held a special meeting at Kingston, Ont., Jan. 3, when the President, W. Harty, between whom and the other directors some friction had arisen, resigned, and A. W. Wheatley, theretofore General Manager, was elected a director to succeed him. The board as now constituted is as follows:—Æmilius Jarvis, Toronto, President; A. W. Wheatley, Kingston, Vice President, and General Manager; R. Hobson, Hamilton, Ont., W. Y. Soper, Ottawa, F. G. Wallace, Pittsburgh, Pa., J. L. Whiting, Kingston, Jas. Redmond, Montreal.

The Goldschmidt Thermit Co. in its publication, Reactions, among a number of illustrated descriptions of thermit welding, gives one of the welding of a locomotive frame at the C.P.R. shops, Revelstoke, B.C. The size of the frame at the point of fracture was 19½ by 3½ ins. The frame had to be taken off the locomotive, so that the weld was made after it had been taken down. There were altogether three breaks, two of which were welded with the frame down, and the third after the frame had been replaced in the locomotive. Altogether 300 lbs. of thermit was used, with the usual percentage of punchings and manganese.

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They have the *Corliss Valve Motion*, conceded by Engineers to be the greatest valve mechanism used in any air drill. Are equipped with *Telescopic Screw Feed*, allowing for the longest range in drilling. Are made in all capacities suitable for drilling, tapping, reaming, rolling flues, wood boring, stay-bolt work and close corner work.

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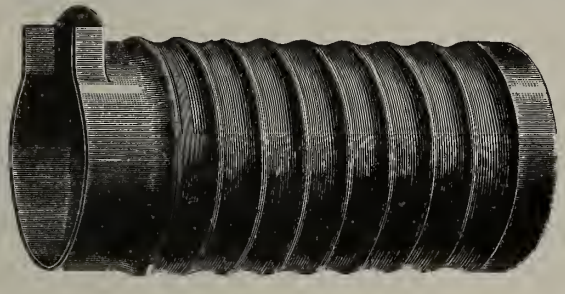
With Plain Ends or Flanged to any required shape.



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TENDERS FOR THE SUPPLY OF TRACK INTERSECTIONS AND OTHER SPECIAL WORK LAYOUTS.

Separate or bulk tenders on prescribed forms will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, Canada, up to noon on Tuesday, February 20th, 1912, for the supply of track intersections and other special work layouts.

Specifications and forms of tender may be obtained on application to the Department of Railways and Bridges, City Engineer's Office, Toronto.

Envelopes containing tenders must be plainly marked "Tender for Track Intersections and Other Special Work Layouts."

The tenderers shall submit, with their tenders, the names of two sureties (approved of by the City Treasurer, not members of the City Council or officers of the Corporation of the City of Toronto), or in lieu of said sureties, the bond of a guarantee company approved of as aforesaid.

The lowest or any tender not necessarily accepted.

G. R. GEARY (Mayor),
Chairman of the Board of Control.
City Hall,
Toronto, January 22nd, 1912.

MANITOBA AND NORTHWESTERN RAILWAY COMPANY.

NOTICE is hereby given that the Manitoba and Northwestern Railway Company of Canada will apply to the Parliament of Canada, at its present session, for an Act authorizing it to increase its bonding powers, and for other purposes.

Dated at Montreal this 12th January, 1912.

H. C. OSWALD,
Secretary.

The delegates attending the International Marine Association's conference at Philadelphia, Pa., in July, will, on the close of the conference, be the guests of the Dominion Government for a tour of the Great Lakes and St. Lawrence, visiting Fort William, Owen Sound, Toronto, Kingston and Montreal.

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There are thousands and thousands of dollars lost every year through the waste of oils in engine-rooms just because an adequate means for storing it has not been provided.

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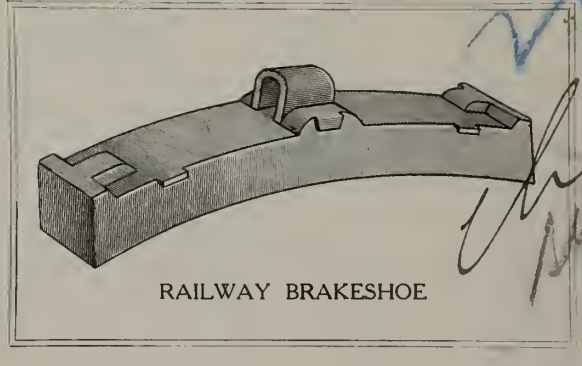

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Electric Headlight Saves Train

(From Daily Papers)

"Wednesday night B———forgot to deliver an order to hold Eastbound Passenger Train, No 6, and only the fact that the Electric Headlight of the oncoming Passenger train was seen at a great distance by the Engineer of the Westbound Freight prevented a head end collision in the———Canyon near———. The warning light was seen in time to enable the freight to get back on to the siding at———."

PYLE-NATIONAL ELECTRIC HEADLIGHT CO.

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A HISTORY OF THE PAY-AS-YOU-ENTER CAR

AND ITS LESSON

The following cities are using Pay-As-You-Enter Cars: Chicago City Railway, 839 cars; Chicago Railways, 1,328; Public Service Corporation of New Jersey, 466; New York City Railway, 555; Third Avenue Railroad, New York, 550; International Railway, Buffalo, 200; Buffalo & Lake Erie Traction Co., 10; Washington Ry. & Elec. Co., Washington, D.C., 100; Capital Traction Co., Washington, D.C., 51; Municipal Traction Co., Cleveland, Ohio, 180; United Rys. Co. of St. Louis, Missouri, 310; Portland Ry., Lt. & Pwr. Co., Portland, Ore., 25; Columbus Ry. & Lt. Co., Columbus, Ohio, 10; Wichita R.R. & Lt. Co., Wichita, Kan., 14; Jacksonville Elec. Co., Jacksonville, Fla., 5; Dallas Elec. Co., Dallas, Texas, 20; Houston Elec. Co., Houston, Tex., 41; Northern Texas Trac. Co., Ft. Worth, Texas, 25; Ithaca Street Ry., Ithaca, N.Y., 2; Peoria Street Ry., Peoria, Ill., 13; Urbana & Champaign Ry., Champaign, Ill., 3; Mutual Lt. & Water Co., Brunswick, Ga., 4; Rochester Ry. Co., Rochester, N.Y., 25; Ft. Dodge, Des Moines & So. R.R. Co., 2; Muskogee Elec. Trac., Muskogee, Okla., 6; Union Traction Co., Dubuque, Ia., 4; Topeka Ry. Co., Topeka, Kas., 12; United Rys. & Elec. Co., Baltimore, Md., 32; Detroit United Ry., Detroit, Mich., 225; Cincinnati Traction Co., Ohio, 50; Montreal Street Railway, 400; British Columbia Elec. Ry., 30; Calgary Street Railway, 18; Metropolitan Street Ry., Kansas City, Mo., 50; Edmonton Radial Ry., 4; San Antonio Traction Co., San Antonio, Tex., 6; Rockford & Int. Ry., Rockford, Ill.; Cairo Street Ry. & Lt. System, 6; Des Moines City Railway, Iowa, 12; Macon Ry. & Lt. Co., Macon, Ga.; Virginia Ry. & Power Co.; Columbia Elec. St. Ry. & Lt. & Power Co., Columbia, S.C.; Aurora, Elgin & Chicago Ry., Chicago, Ill.; Wichita Falls Traction Co., Wichita Falls, Tex.; Ottawa Electric Ry. Co., Ottawa; Bloomington & Normal Ry. & Lt. Co., Bloomington, Ill.; Corsicana Transit Co., Corsicana, Tex.; Compania Electrica y de Ferrocarriles, Mexico; The Milwaukee Elec. Ry. & Lt. Co., Milwaukee, Wis.; Springfield Street Ry. Co., Springfield, Mass.; Lynchburg Traction Co., Lynchburg, Va.; Chicago & Southern Traction Co., Chicago, Ill.; Calumet & South Chicago Ry. Co., Chicago, Ill.

THE LESSON

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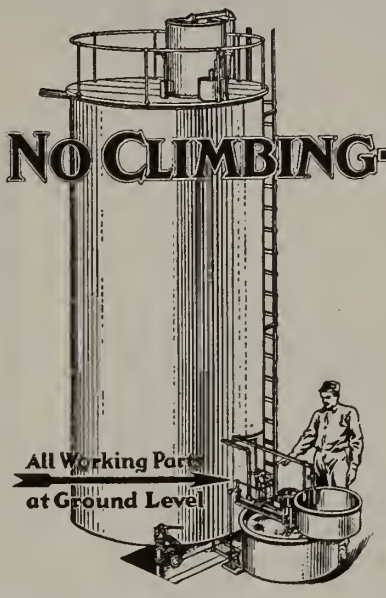

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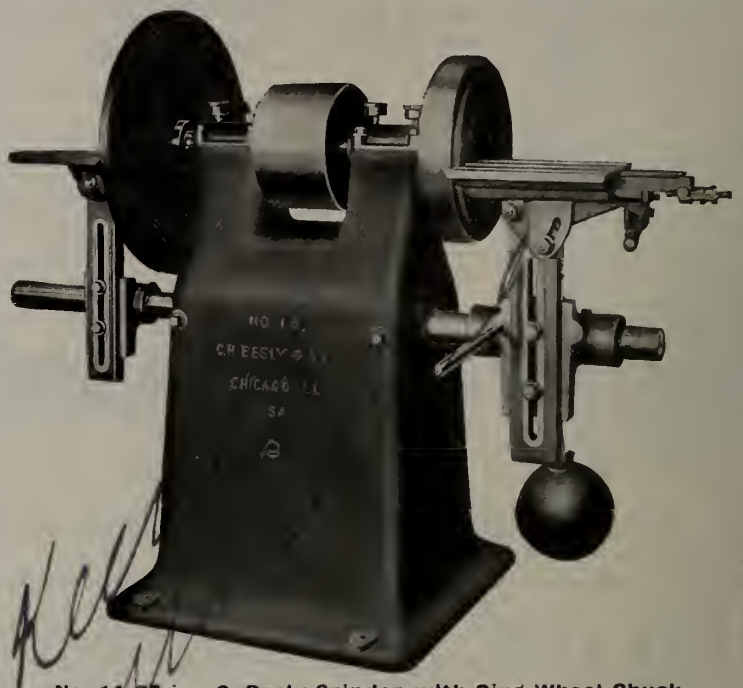

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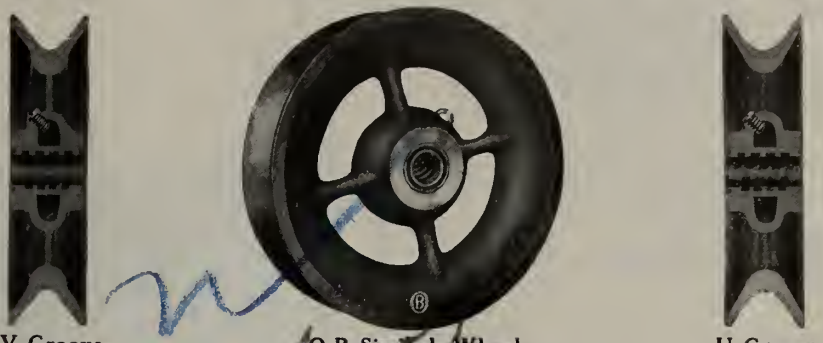

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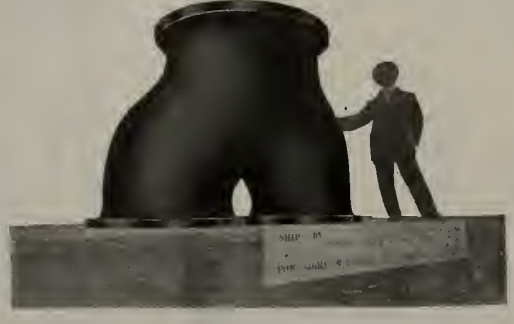

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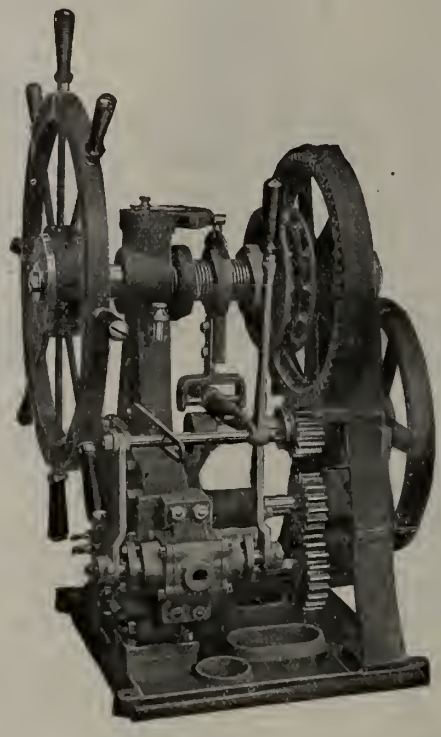

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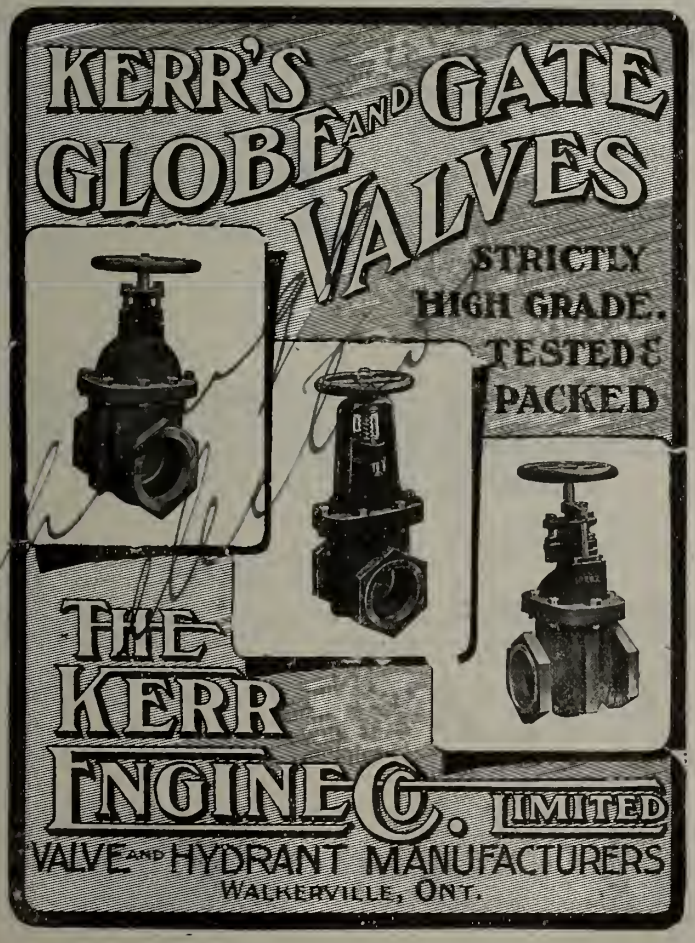

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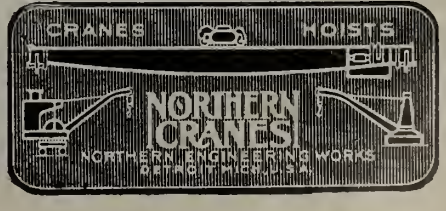

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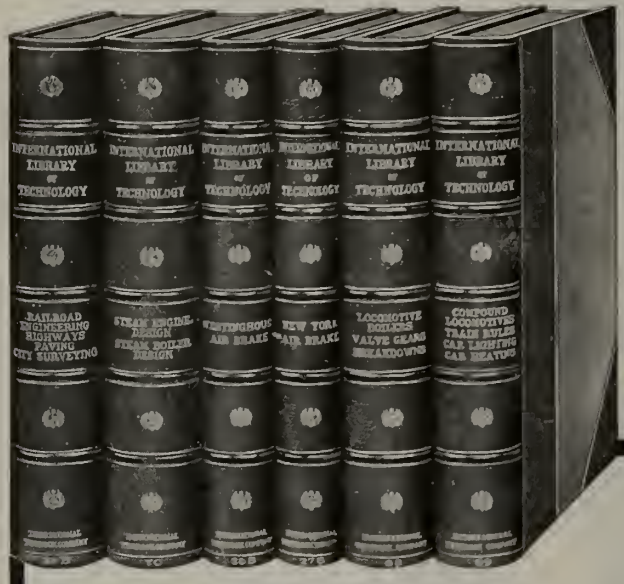

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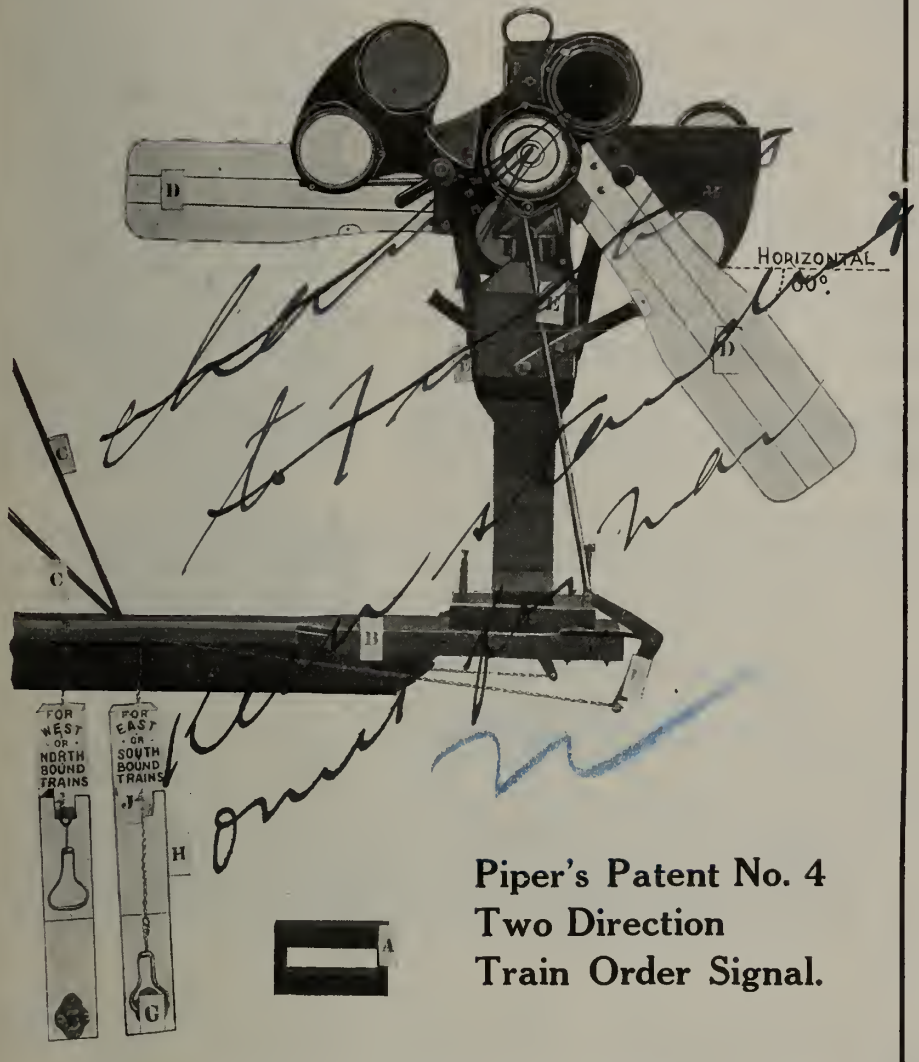

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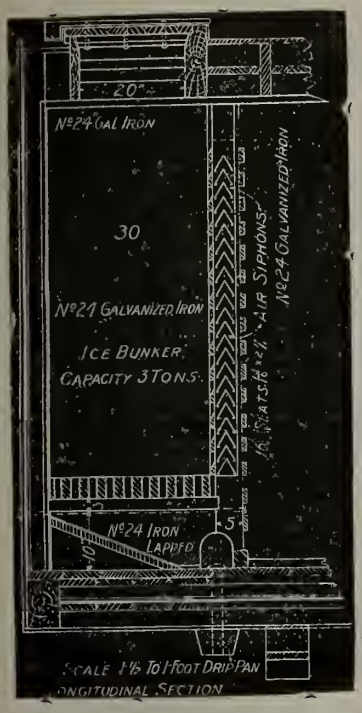

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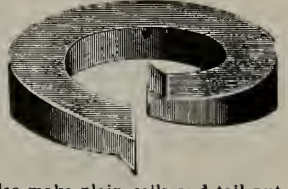

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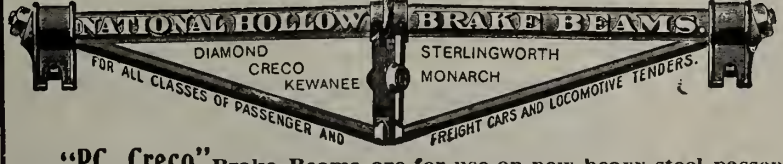

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Robb Engineering Co., Ltd., Amherst, N.S.

Engines, Steam
Allis-Chalmers-Bullock, Ltd. ....Montreal.

Explosives
Curtis's & Harvey (Canada) Ltd..Montreal

Express Office Signs
Acton Burrows, Limited .....Toronto.

Ferro-Vanadium
American Vanadium Co. ..Pittsburgh, Pa.

Files
Nicholson File Co. .....Port Hope, Ont.

Fire Extinguishers
Miller Chemical Engine Co...Chicago, Ill.

Flags
The Hudson's Bay Co. .....

Flour
The Hudson's Bay Co. .....

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American Vanadium Co. ..Pittsburgh, Pa.
Canadian Car & Foundry Co.....Montreal.
Crossen Car Mfg. Co.....Cobourg, Ont.
Nova Scotia S. & C. Co..New Glasgow, N.S.
Steel Co., of Canada, Ltd., Hamilton, Ont.
Titanium Alloy Mfg. Co. .....Montreal

Foundry Appliances
C. H. Besly Co. .....Chicago, Ill.
Ontario Wind Engine & Pump Co. Toronto

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Can. Ramapo Iron Wks. ...Niagara Falls
Johnson Wrecking Frog Co..Cleveland, O.

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Continental Iron Works....Brooklyn, N.Y.

Furnaces, Oil
Railway Materials Co. .....New York.

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Fuses, Electric
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McCord & Co. .....Chicago, Ill.

Gates, Crossing
The N. L. Piper Ry Supply Co....Toronto.

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Ohio Brass Co. .....Mansfield, Ohio.

Gauges, Locomotive
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Gauges, Water
Detroit Lubricator Co. ....Detroit, Mich.
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Gears
American Vanadium Co. ..Pittsburgh, Pa.
Titanium Alloy Mfg. Co. .....Montreal

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Corbet Fdry Co., Ltd. ..Owen Sound, Ont.

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Canadian Gen. Elec. Co., Ltd....Toronto
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Grates, Shaking
Babcock & Wilcox .....Montreal.
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Hammers, Cast Steel
Am. Brake Shoe & Fdry Co.Mahwah, N.J.
James Smart Mfg. Co. ....Brockville, Ont.

Handcars
Canadian Fairbanks-Morse Co...Montreal
Crossen Car Mfg. Co. .....Cobourg, Ont.
Dominion Equip. & Supply Co..Winnipeg.
F. H. Hopkins & Co. .....Montreal.
Mussens, Ltd. .....Montreal.
Rice Lewis & Son .....Toronto.

Hardware
The Hudson's Bay Co. .....
Rice Lewis & Son .....Toronto.
Headlights
Commercial Acetylene Co. .....Toronto.
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Pyle National Elec. Headlight Co. Chicago.
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Crossen Car Mfg. Co. .....Cobourg, Ont.
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Robb Engineering Co., Ltd..Amherst, N.S.
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Canadian Gold Car H'g & L'g Co.Montreal.
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Safety Car Heating & L'ting Co.New York.
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National Boiler Washing Co.....Montreal
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Dake Engine Co. .....Grand Haven, Mich.
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Hoists, Pneumatic
Taylor & Arnold .....Montreal.
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Duner Co .....Chicago, Ill
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Guilford S. Wood .....Chicago, Ill.
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Inspections
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Imp. Guarantee & Acc. Ins. Co....Toronto.
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Lamps, Incandescent
Canadian Gen. Elec. Co., Ltd....Toronto
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Commercial Acetylene Co. .....Toronto.
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Montreal Locomotive Works .....Montreal.
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Dominion Equip. & Supply Co..Winnipeg.
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Baldwin Locomotive Works...Philadelphia.
Canadian Gen. Elec. Co., Ltd....Toronto
Montreal Locomotive Works .....Montreal.
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Baldwin Locomotive Works...Philadelphia.
Canadian Locomotive Co....Kingston, Ont.
Locomotive, Rack
Baldwin Locomotive Works...Philadelphia.
Canadian Locomotive Co....Kingston, Ont.
Montreal Locomotive Works .....Montreal.
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Gartshore-Thomson, P. & F Co..Hamilton
Pipe, Sewer, Cast Iron
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Cleveland Bridge & Eng. Co. Ltd.Cleveland
Dominion Bridge Co. .....Montreal.

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Jas. W. Pyke & Co. .....Montreal.

Turbines, Steam
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Canada Foundry Co., Ltd. .....Toronto.

Turnbuckles
Canadian Steel Foundries, Ltd...Montreal.
Canadian Bridge Co. ....Walkerville, Ont.
Dominion Bridge Co. .....Montreal.

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Detroit Lubricator Co. .....Detroit, Mich.

Valves, Angle and Globe
Detroit Lubricator Co. .....Detroit, Mich
Kerr Engine Co. .....Walkerville, Ont
Nathan Manufacturing Co. ....New York

Valves, Brass Gate
Canada Foundry Co., Ltd. .....Toronto
Detroit Lubricator Co. .....Detroit, Mich
Kerr Engine Co. .....Walkerville, Ont.

Valves, Iron and Brass
Canadian Fairbanks-Morse Co...Montreal

Valves, Iron Gate
Canadian General Elec. Co., Ltd., Toronto.
Kerr Engine Co. .....Walkerville, Ont.
Detroit Lubricator Co. .....Detroit, Mich.

Valves, Locomotive Pop
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Velocipedes
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Canadian Car & Foundry Co.....Montreal.
Jas. W. Pyke & Co. .....Montreal.

Wheels, Locomotive
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E. F. Phillips Elec. Works, Ltd...Montreal.
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Canada Wire & Cable Co., Ltd. ..Toronto.
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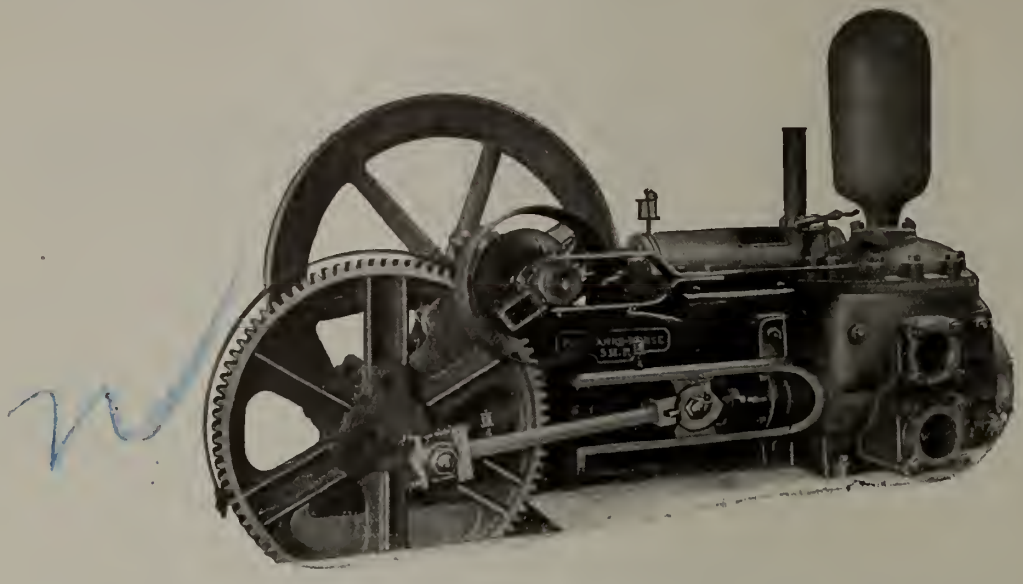

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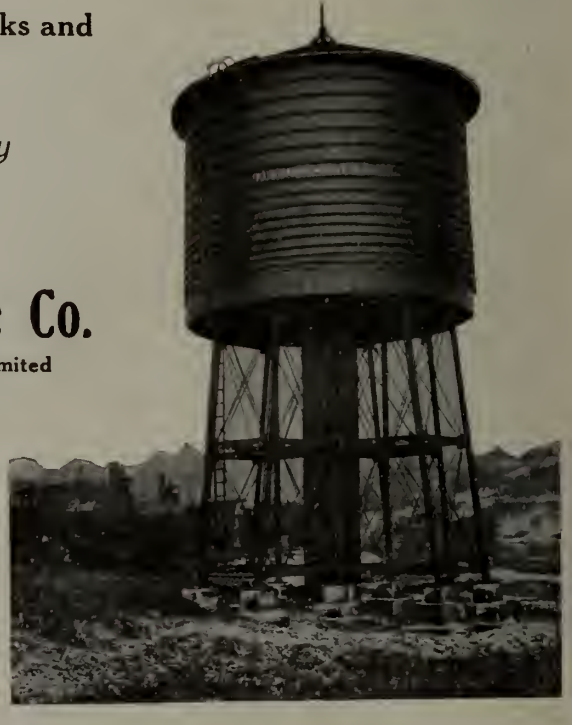

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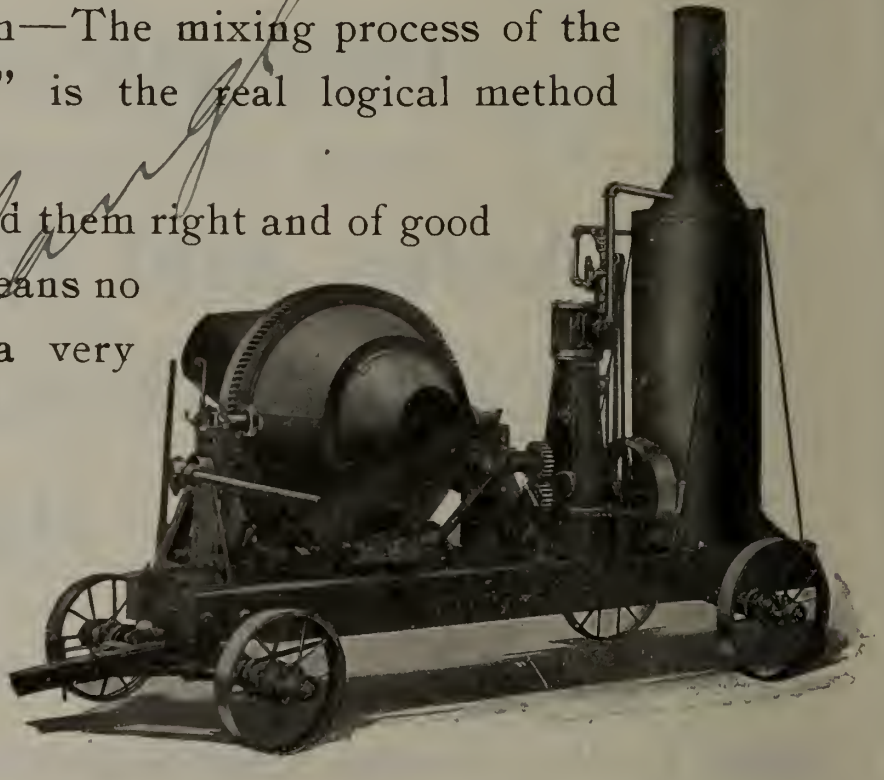

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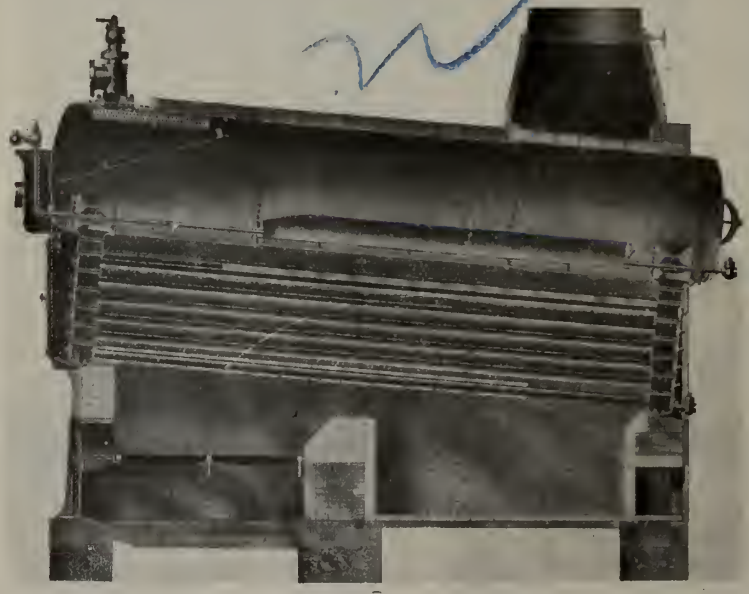

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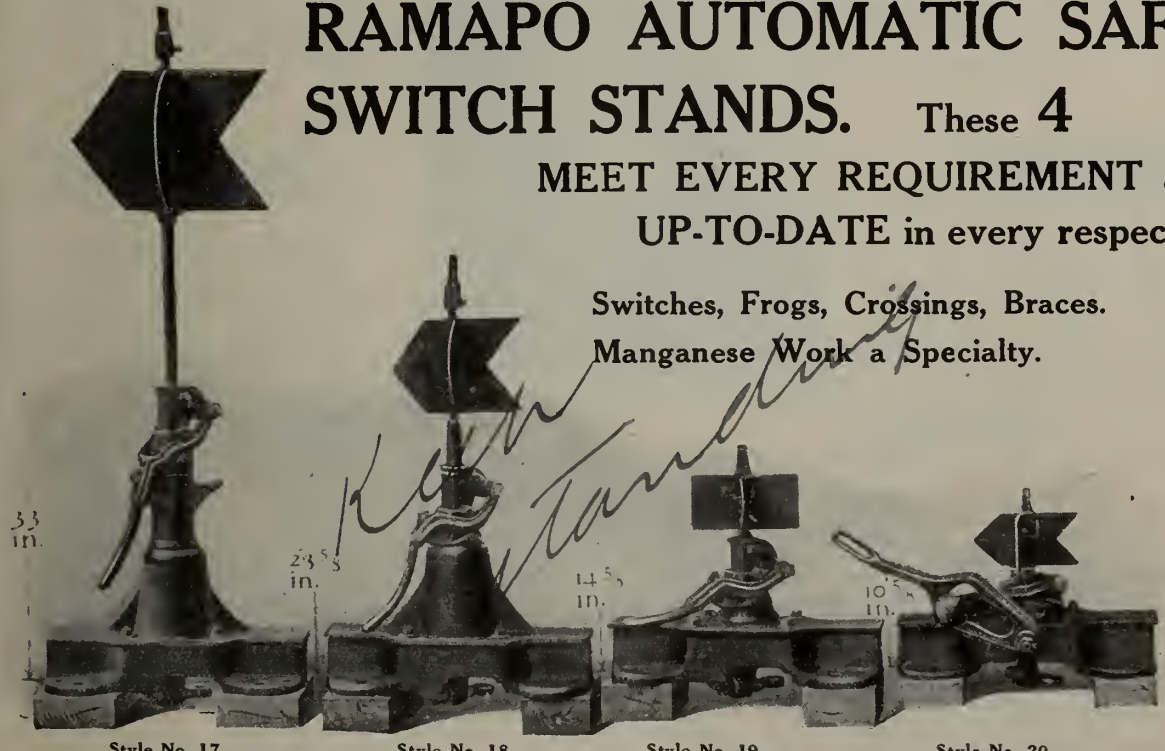

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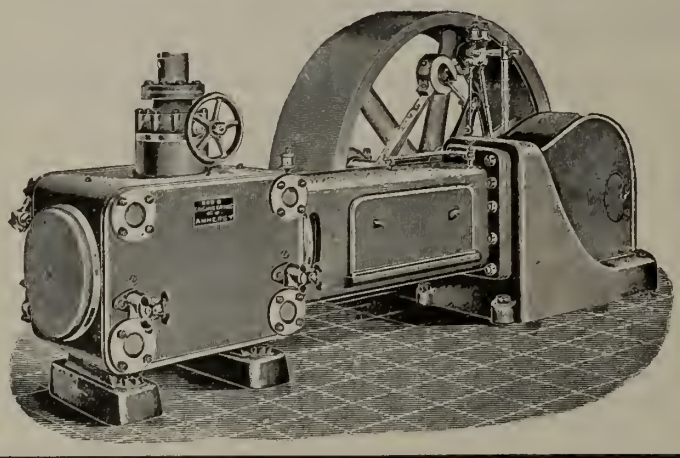

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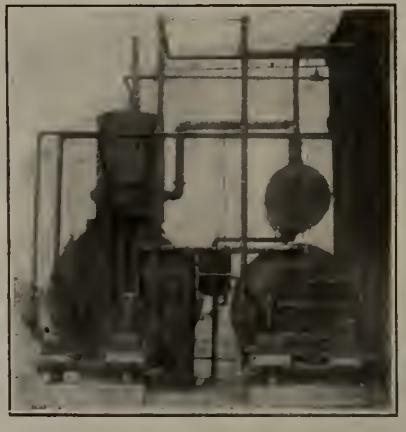

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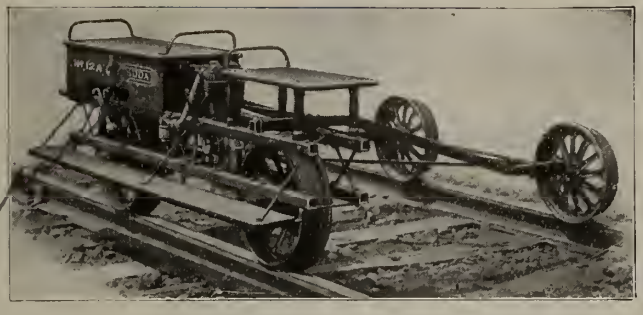

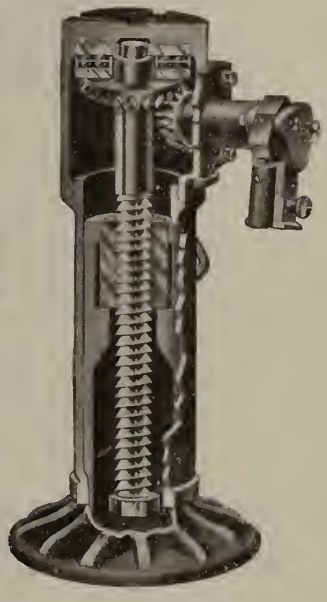

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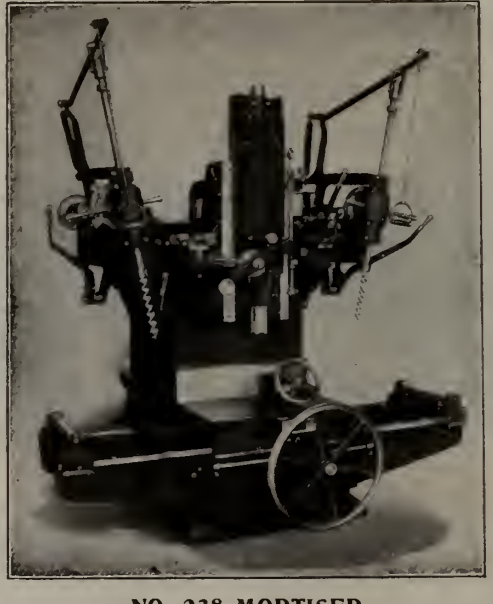

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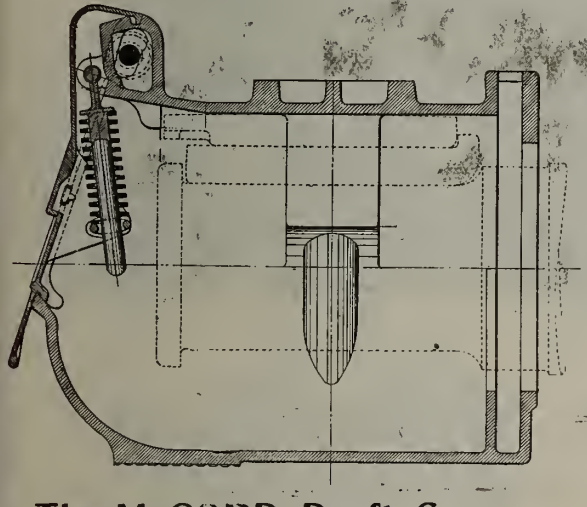

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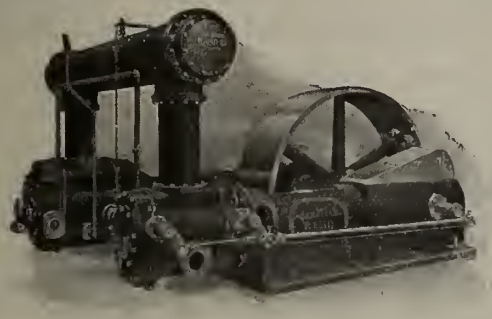

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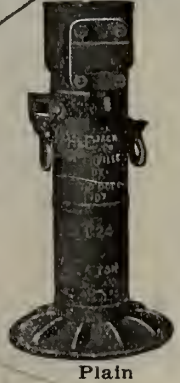

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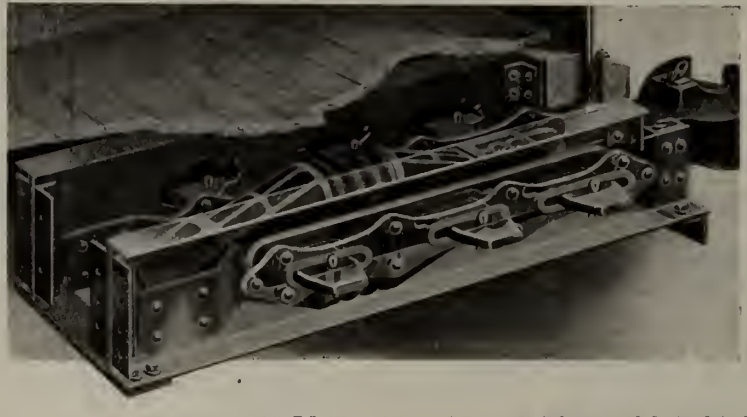

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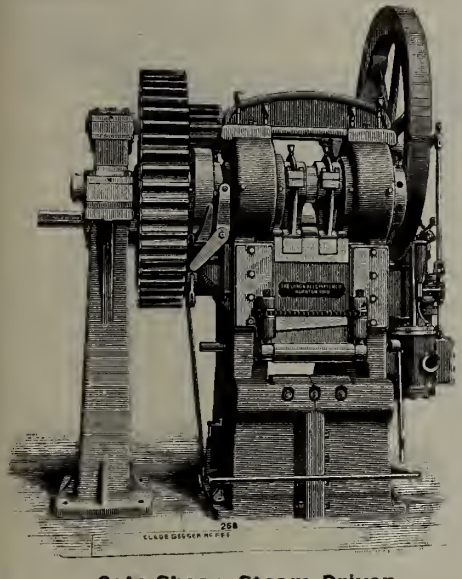

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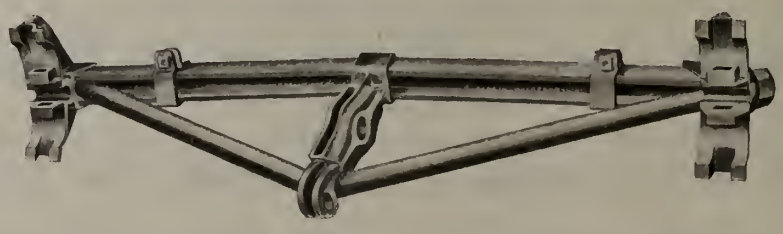

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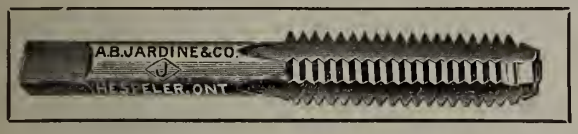

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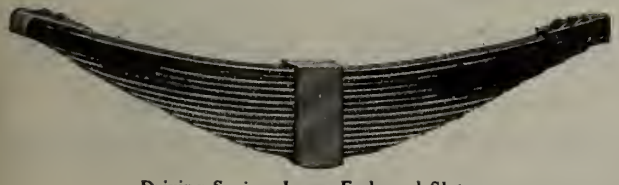

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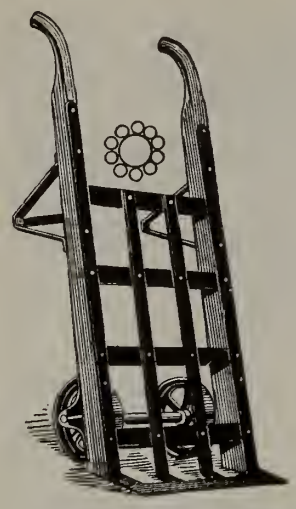

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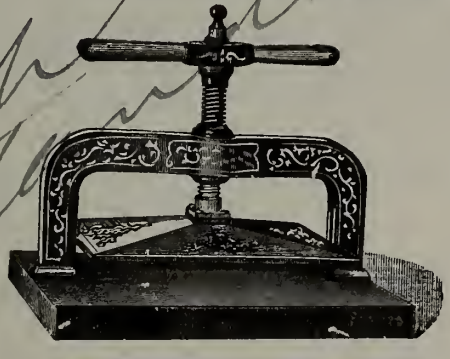

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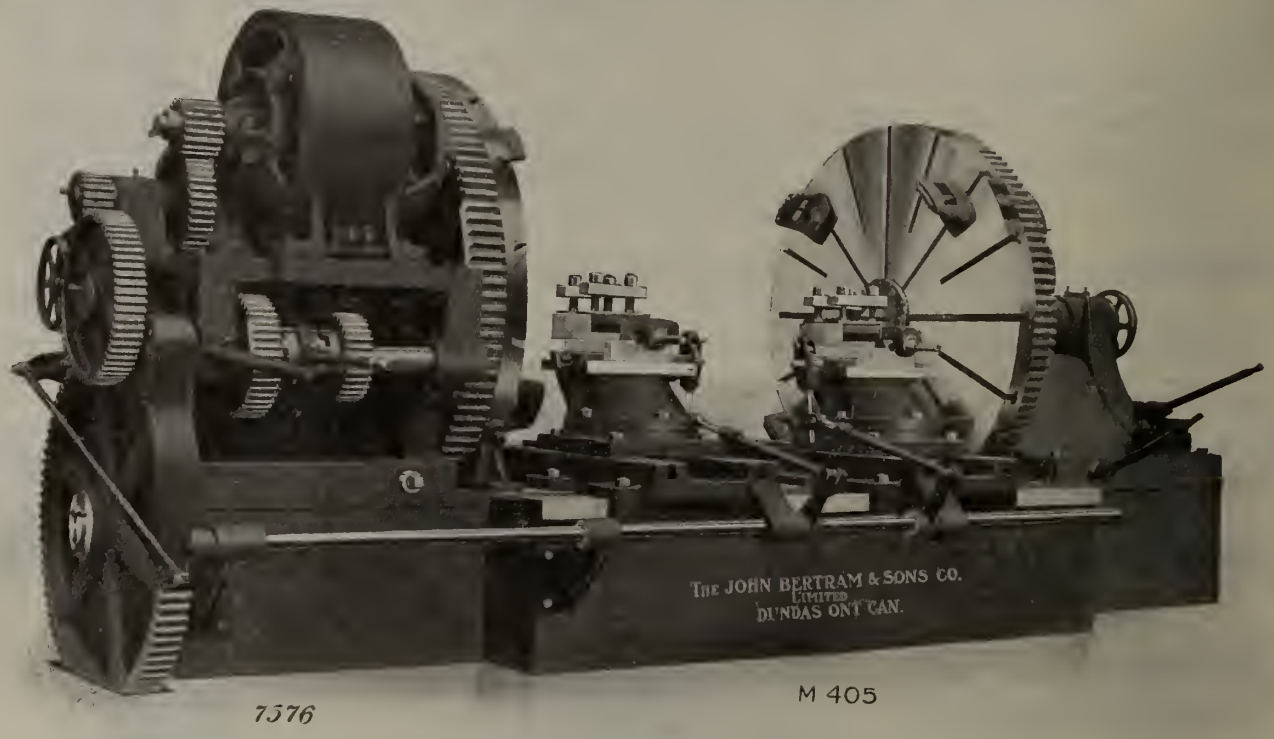

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The Railway and Marine World

March, 1912.

Canadian Pacific Railway Mallet 0-6-6-0 Locomotives.

By Frederick H. Moody, B.A.Sc.

In common with the latest developments in motive power additions on United States railways, the C.P.R. has, during the past three or four years, been experimenting with Mallet locomotives for pusher service on the mountain sections of the British Columbia Division, where gradients up to 2.45 and 15-degree curves are to be negotiated. For this service Mallet locomotives are particularly adapted. The locomotives at present working on these gradients are consolidation, with 21 by 28-in. cylinders and 58-in. driving wheels, with a total weight of 185,000 lbs., 168,000 lbs. of which is on the driving wheels. These locomotives, under normal summer conditions, are capable of handling trains up to 424 tons on the accepted rating, and it is to assist such locomotives over the heavy gradients that experimental work on Mallet locomotives has been performed, leading up to the present locomotives herein referred to.

During 1909 an experimental Mallet locomotive was built by the C.P.R., to its own designs, a description of which was given in The Railway and Marine World of Aug., 1909. This locomotive contained many features that were decidedly unique in Mallet construction. Following considerable experimental work and investigation on operating performances, a number of changes were embodied in the design. This remodelled locomotive was described in detail by G. I. Evans, Mechanical Engineer, C.P.R., in The Railway and Marine World of April, 1910. That article also contained an outline and data of test runs made on the gradients near the Angus shops. Following this experimental stage the locomotive was put into service on the B.C. Division under the conditions for which it was designed. Here a very elaborate series of tests under actual operating conditions was performed, the graphical results of which were embodied in an article in The Railway and Marine World for Jan. of this year.

All this experimental work gave the C.P.R. mechanical department a great deal of data upon which to base the design of a further series of five Mallets, a description of which is embodied herewith. This new series which has only recently been finally completed, consists of 4 compounds, 1951-4, and one simple 1955, all of the same general design. The general appearance of the compound Mallets of the series is shown in the accompanying illustration, fig. 1, while fig. 2 outlines the locomotive construction more in detail.

The following table gives the principal dimensions:

Type	0-6-6-0
Gauge	4 ft. 8½ ins.
Service	Pusher
Fuel	Bituminous coal
Tractive power	57,000 lbs.
Weight, drivers	259,000 lbs.
Weight, total	259,000 lbs.
Wheel base, front engine	10 ft. 4 ins.
Wheel base, rear engine	10 ft. 4 ins.
Wheel base, total, engine	35 ft. 2 ins.
Wheel base, engine and tender	60 ft. 7 ins.
Weight on drivers÷tractive effort	4.54
Tract. effort×dia. drivers÷equiv. heat. surf..	921
Equiv. heat. surf.÷grate area	62
Weight on drivers÷equiv. heat. surf.	72
Cylinders, h.p.	23 x 26 ins.
Cylinders, l.p.	34 x 26 ins.
Cylinders (simple engine 1955 only)..	20 x 26 ins.
Valves, h.p.	11 in. Piston
Valves, l.p.	12 in. Piston
Driving wheels, dia.	58 ins.
Driving axles, main, 9½x12 ins.; others	9x12 ins.
Boiler	Radial stayed, wagon top
Pressure	200 lbs.
Firebox, size	120 x 69⅞ ins.
Firebox, sheets	5-16, ⅜, 1-12 and 7-16 ins.
Firebox, water spaces, sides, 4½ ins.; throat, 5 ins.; back, 3½ ins.	
Tubes, 154 2¼-in. dia.; 16 2-in. dia.; and 22 5¼-in. dia.	
Tubes, length between sheets	20 ft. 1½ ins.
Heating surface, tubes	2,589 sq. ft.
Heating surface, firebox	180 sq. ft.
Heating surface total	2,769 sq. ft.
Superheating surface	548 sq. ft
Equiv. heat. surf. (=total heat. surf.+super. surf.×1.5)	3,591 sq. ft
Grate area	58 sq. ft.
Tender tank, kind	Semi-water bottom
Tender frame sills	Centre, 13 ins.; sides 10 ins.
Tender trucks, kind	Equalizer
Tender wheels, diar.	34 ins.
Tender axles	5½ x 10 ins.
Water capacity	5,000 Imp. gals.
Coal	12 tons

Fig. 1.—Canadian Pacific Railway Mallet 0-6-6-0 Locomotive.

A cursory inspection of both figs. 1 and 2 will show that the construction of these Mallet locomotives is decidedly different from the practice followed by U.S. roads that have added Mallets to their rolling stock. Principal among these points of difference are the arrangement of cylinders and the absence of leading and trailing wheels, placing all the weight on drivers and shortening the wheel base. The usual arrangement is to place the low pressure cylinders at the forward end of the front engine, demanding more flexible and extension joints in the steam pipe lines. The angular movement of the exhaust pipe itself, from low pressure cylinder to exhaust pipe in smoke-box, is very materially reduced by this new arrangement, as may readily be understood, from the fact that the low pressure cylinder, being near the point of swing with regard to the rear engine frame, has but little side motion. The arrangement used will be explained more fully at a later point.

THE BOILER used in this series of locomotives has been changed very materially from that used in the original experimental Mallet. In the latter, the boiler, which was of the wagon-top radially stayed type, had the barrel divided into three sections. The rear section comprised the boiler proper, extending about two-fifths the length of the barrel. In front of this there was a compartment containing the superheater tubes, which projected downward from steam headers into the path of the flue gases. From this compartment the flue gases passed on into a further plain tube section, constituting a feed-water heater. The feed water, warmed in this compartment, passed on to the rear section, was there converted into steam and passed out into the superheater tubes, and thence to the high pressure cylinders through outside pipes passing down each side from the steam dome. In this newer design, a plain wagon-top, radially-stayed boiler is used, this design being found preferable to the three-compartment type used experimentally.

The tube sheets, 20 ft. 1½ ins. apart. provide for flues of a normal length, in contradistinction to some recent U.S. designs, where tube lengths up to 24 ft. are to be found. It is in every sense a plain barrel boiler of the extended wagon-top type, with the possible exception that the corners of the firebox. both inside and outside, are greater than usual to increase the boiler rigidity, as lack of the latter is believed to be re-

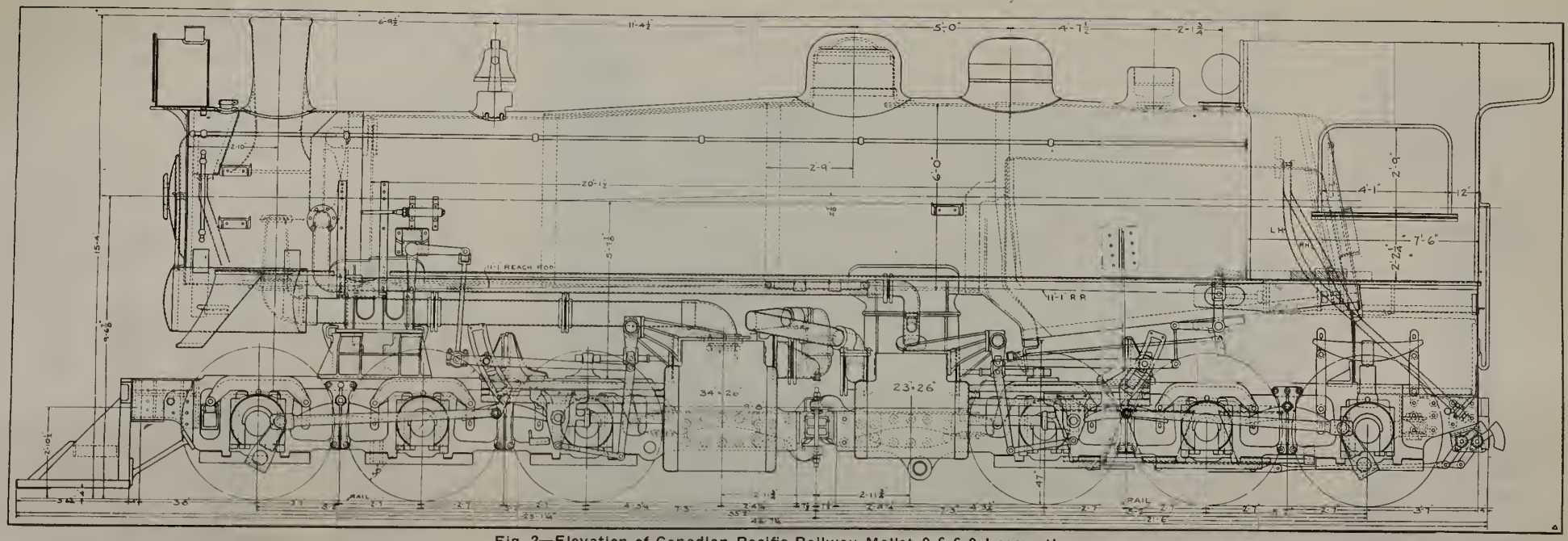


Fig. 2—Elevation of Canadian Pacific Railway Mallet 0-6-6-0 Locomotive.

sponsible for staybolt breakage in the end rows.

The feed-water heater and superheater chamber being eliminated, a superheater of the Vaughan-Horsey type is placed in the smoke-box, the arrangement of headers, etc., being noted in the elevation drawing, fig. 2. The injector check valve is located on the top centre line of the boiler, under the bell stand, and has three connections—one for the left and another for the right hand injectors, and a third for connection with pipe or hose coupling for use in filling or blowing off the boiler.

Instead of placing both sand boxes on top of the boiler as in the former design, one of them is located in the upper forward part of the smoke-box, feeders leading down on the inside of the smoke-box shell. The box is filled through a small door on the top.

The experimental locomotive had a double petticoat smoke stack. In the new design this has been eliminated and a single wide-flare stack introduced in its place.

Frame, Connections and Spring Rigging.—The frames for each engine are one-piece steel castings, slabbed for the cylinder fit, and also for the front bumper and back foot-plate. The sections of both top and bottom rails of the frames are 4½ ins. wide by 4½ ins. deep and 4½ ins. wide by 3 ins. deep respectively.

The only feature of particular importance about the frames lies in the manner of connection between the front and rear engines. In the experimental locomotive a plain pin connection at the point of juncture of the two connecting castings served as the means of connection. This pin was in triple shear when pulling, but was relieved of all strain when pushing, by the design of the connecting castings being such as to have corresponding contact faces, taking up all thrust independently of the pin.

The new method of frame connection is clearly shown in fig. 3, a plan view of the immediate vicinity of the connection. Essentially, the connection is similar to that between engine and tender, a built-up plate drawbar, 9 ft. 8 ins. long, as shown in the illustration, being used. This connecting drawbar is pin-connected at the rear end of the cross-bracing castings between the cylinders. The faces of the castings, where they come in close proximity to each other at the inner ends, have a curved surface, with a radius to the centre of the drawbar pin. A concaved casting with similar curved surfaces acts as a filler, permitting a rolling motion between the front and rear engines when rounding curves. That is to say, the intervening piece so adjusts itself as the engine takes a curve that its centre is always in a line joining the two drawbar centres. This arrangement maintains a close alignment between front and rear sections, eliminating all play.

The drawbar was so designed as regards length that as the adjacent ends of the frames move outward when taking a curve, the centre of the drawbar is always in the centre line of movement, i.e., directly over the centre of the track, keeping the push or pull where desired, and overcoming the difficulties that would be experienced from side thrusts were the connections as in the original design.

Centring rods, to maintain the relative location of front and rear engines with regard to each other, are attached, one on each side of the connecting casting of the rear engine, these being attached by pins at the centre to the connecting casting of the front engine, as shown in fig. 3. The relative positions being thus maintained, the intervening distance casting has no tendency to jam in place.

When pulling, the front part of the forward engine of a Mallet has a tendency to lift, this condition being reversed when the engine is pushing. In this new design this undesirable feature is taken care of by means of bolts carrying compression springs passing down from lugs on the upper surface of the connecting casting of the back truck to similar lugs on the lower surface of the connecting casting of the front truck as indicated both in fig. 3, and at the point of connection in fig. 2. Thus, the connecting casting of the rear frame, through its bolts, carries the rear end of the forward frame when the front of the latter tends to rise, with a consequent depression of the rear end. The springs, mounted on the carrying bolts, absorb any quick fluctuations that may occur.

The spring rigging is of the usual type, equalized from front to rear on each truck. The forward engine has a cross equalizer at the front, but the rear engine is merely equalized along the sides.

Cylinders and Motion Work.—Both pairs of cylinders are of the piston valve type, with inside admission on the high, and outside on the low pressure engines. They are decidedly unique, forming a radical departure from the practice heretofore followed in Canada. The low pressure cylinder, being typical of both, is shown in fig. 4.

The point of particular change lies in the fact that the cylinders are made of cast steel, lined with cast-iron bushings. Making them of steel saves a weight of no less than 6,000 lbs., which is a very important factor where weight elimination to obtain greater steaming capacity is desired. An examination will show how extremely light in construction the cylinder is, the shell being only ⅝ in. in thickness, with a corresponding high pressure thickness.

The cylinders are cast separately, divided at the centre line as usual. In the case of the high pressure cylinder, there is a cast-steel saddle common to

both cylinders and bolted to their top face, and to which the boiler is attached. The original low pressure had a small saddle bolted to the upper surface with a corresponding saddle attached to the boiler barrel, bearing upon it. In this design, this support has been dispensed with, for, on account of the movement

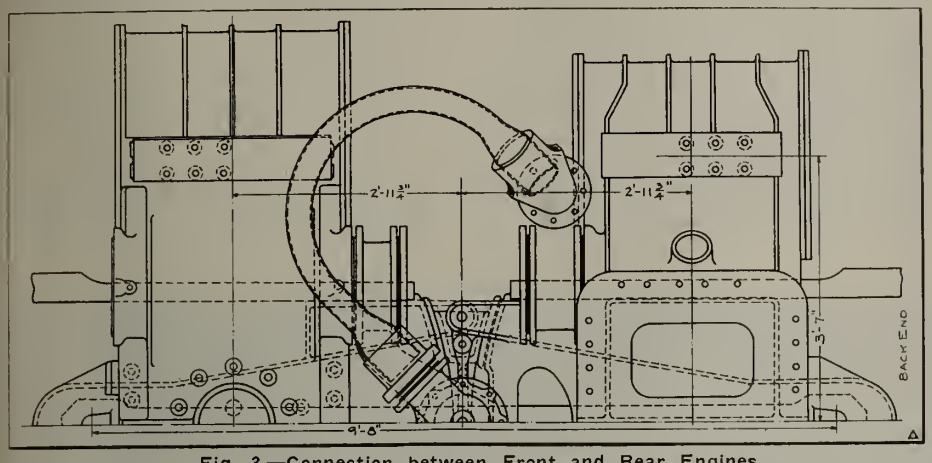


Fig. 3.—Connection between Front and Rear Engines.

possible at this point, pounding occurred, which could be attributed directly to the bearing surfaces knocking.

The Walschaert valve motion is used on both engines and is of the usual type to conform to C.P.R. standard practice with inside supported trunnioned bearings, dispensing with encompassing support. The front radius rod has a long suspension from the reach rod bell-crank, which combined with a ball and universal joint at the lower and upper ends respectively, allows the engine to take curves without much distortion to the valve motion. When rounding a sharp curve, the boiler will swing about 9 ins. off the centre line. This necessitates flexible joints. In addition, if the lifting link were short, it would swing over to a considerable angle when on this 9-in. offset, resulting in a lifting of the radius link from its normal position. This would shorten the valve travel when in forward gear, and lengthen it when in backward. The length of link here shown is sufficient to make this feature practically negligible.

Provision has been made for changing piston packing rings by simply removing the front cylinder heads, disconnecting the main rod from the crosshead and pushing the piston out into the space between the two cylinders. The piston valves have also been taken care of in a similar manner, so there can be no objection in this arrangement of cylinders on the score of inaccessibility.

An ingenious mechanical reverse mechanism, shown in fig. 5, has been designed for this engine. The operating mechanism consists of an 8-in. air cylinder, dampened in its movements by a 6-in. oil cylinder with an adjustable by-pass connecting the cylinder ends. The crosshead of the machine is attached to a fulcrumed lever, the upper end of which is connected by a short link to a rod, threaded for about two-thirds its length with a sextuple thread, 4½-in. pitch. This threaded rod is guided, attached to the top of the air and oil cylinders.

Confined in the casting above the opening between the air and oil cylinders there is a nut fitting the sextuple threaded rod. The outer surface of this nut is notched to receive a dog from above. This dog is moved automatically by the engineer when shifting the gear by the air valve above.

The operation is as follows: Swinging the handle of the 3-way valve to the right from the notch on the quadrant, lets air into the left end of the cylinder. The same movement of the 3-way handle raises the dog which engages the sextuple-threaded nut. This is performed by a projection on the side of the handle near its point of suspension engaging another projection on the dog rod. Otherwise, the piston would not move by the air pressure, the dog engaged in the nut locking the piston in place.

The air moves the piston to the right, carrying forward the crosshead and lowering the links. The forward movement of the piston draws forward the sextuple-threaded rod, causing the nut to revolve in its retaining casting. When the gear has moved to the desired location, the 3-way valve handle is brought back to its vertical position, which drops the dog back into the nut, locking the mechanism instantly in the desired location.

The mechanism is so designed as to make it possible to change the amount of motion of the low pressure gear, without disturbing that on the high pressure cylinder. The high pressure gear receives its motion directly from the fulcrumed lever moved by the air piston. On the same shaft as this fulcrumed lever there is keyed another lever, shown at the extreme right in fig. 5. This lever has a block adjustable a couple of inches by a set screw. To a pin in this moveable block the low pressure gear reach rod is attached. As shown in fig. 2, this reach rod, being too long for one piece, is made in three sections, with the middle section guided in bearings under the runboard near the centre of the locomotive.

PIPING.—A standard throttle valve located in the steam dome of the boiler supplies steam to a long dry pipe which runs forward to the front tube sheet. Here it connects to the saturated steam header and after traversing the superheater tubes to the superheated steam header branches out each side of the smoke-box, to a lagged pipe under each runboard, leading back to the high pressure cylinder.

The piping for carrying the exhaust from the header between the two high pressure cylinders to the low pressure cylinder header is quite ingenious. This piping is shown to the best advantage in fig. 3, which, in conjunction with fig. 2, clearly outlines the arrangement. The idea was to pipe the steam from the high pressure engine to some point on the low pressure engine that had no motion relative to the latter. Such a point exists directly over the point of connection between the two connecting castings. This was absolutely the case in the old design where a pin connection was employed. By bringing the exhaust pipe to meet the intake pipe of the low pressure directly over the pin-connected point, there is no motion between the two other than a slight circular one, allowed for by a swivel joint. In this new design, however, as the locomotive takes a curve, the new drawbar arrangement causes these central joints on both frames, to part as they swing outward due to the engine negotiating the curve. That is to say, the actual centre line of the locomotive lengthens—a case of two sides of a triangle being greater than the third.

The method of making these steam connections is as follows: The steam pipe, rigidly connected to the header of the high-pressure cylinder, is bent into a large loop as in fig. 3, the section of the pipe itself being first flattened into an oval section as indicated in fig. 2, the

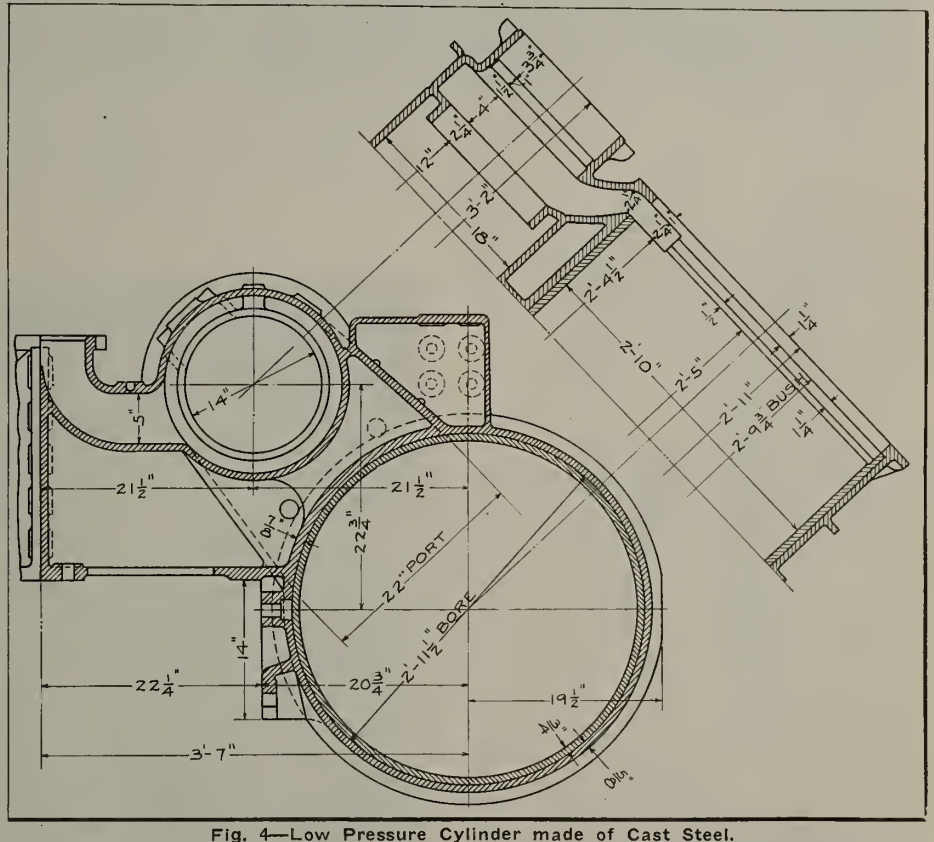


Fig. 4—Low Pressure Cylinder made of Cast Steel.

pipe thus assuming the shape of the tube of a Bourdon gauge. The other end is connected by a swivel joint to the low pressure header. Now, as the locomotive takes a curve, this central point of the swivel joint becomes further away from the corresponding point in the high pressure frame, by a fraction of an inch, causing the distance between the pipe connection centres to slightly increase. A solid pipe connection would likely break under such a strain, but having this pipe not only flattened, but also bent to a large loop, it contains sufficient flexibility to spring the necessary amount.

From the low pressure header, the steam passes through the cylinders and out through another swivel joint to the exhaust pipe. This contains another feature peculiarly different from standard Mallet practice, though similar to that of the experimental locomotive. The small side swing of the exhaust outlet of the low pressure cylinders (less here even than in the experimental locomotive, on account of the outlet being on top less than 3 ft. from the point of swing), results in the elongation of this pipe being practically negligible. Thus the expansion joints in the usual design, capable of providing for extensions up to 1½ in. are not necessary. Instead, the extension is compensated for by the sliding of the pipe flanges on the flat

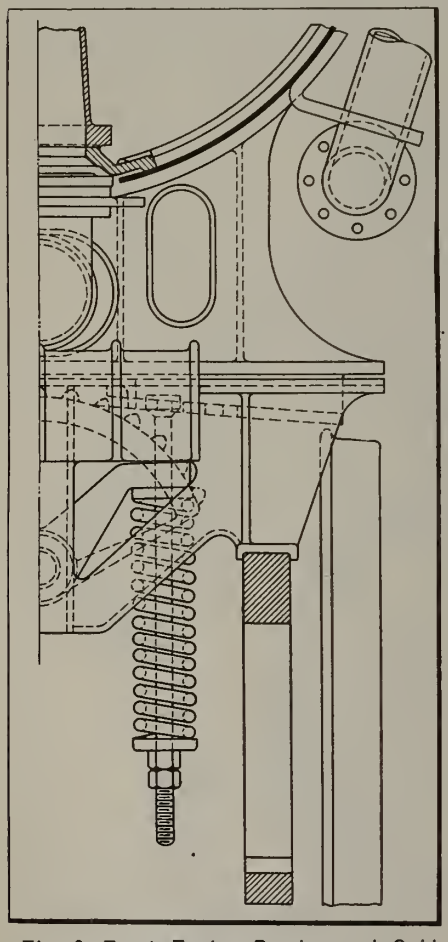


Fig. 6—Front Engine Bearing and Guiding Attachment.

faces of the ball rings. The flanges are held to their seats by 10 springs of 200 lbs. capacity each, or a total of 2,000 lbs. The exhaust from this point proceeds up the exhaust pipe.

GUIDING POWER OF FRONT ENGINE.—Guiding trucks have been dispensed with in this design of Mallet, it being believed that equally good guiding qualities may be obtained without their use. Their elimination reduces the wheel base and total weight, and the flange pressure is sufficiently low to safely warrant their absence.

In curving, it is the boiler body that offers the greatest resistance, and as the truck must swing laterally beneath it, it is supported partly by friction plates and partly by a spring suspended-roller. The arrangement of these suspending means is clearly shown in fig. 6. As indicated, there are two main castings, one mounted rigidly on the frames and the other bolted securely to the boiler body. One half the weight of the boiler is carried on plain, flat friction plates attached to the faces of the two main castings. There are four of these, in pairs, the intervening space being occupied by the floating device. The friction plates have ample surface, and are provided with oil grooves across the surfaces, which, connected with an oil box in the upper casting, ensures ample lubrication.

In the intervening space mentioned above, the floating device is located. Two wedge-shaped pieces, as indicated, are secured to the lower face of the upper casting, one on each side of the centre. These wedges have two different slopes, the steeper one being at the centre. A toothed roller engages with similar tooth cavities in the lower side of the wedge plates, this in turn being mounted on a floating shaft carried by two cross equalizers to springs supported on bolts from the lower casting. Any side movement of truck as when the locomotive is taking a curve, causes the inclined surfaces to force the roller downward against the resistance of the supporting springs, which produces a force to pull the boiler around the curve with the truck, and relieve the rear truck, to which the boiler is rigidly connected, from much of the strain, that would otherwise fall on the flanges of the leading pair of drivers of the back truck. The greater the side movement of the truck, the greater will be the reaction from the spring compression, resulting in a constantly increasing rolling resistance.

The frictional resistance of the flat friction plates decreases on taking curves, for, on account of the depression of the floating springs, a greater weight is carried by the latter part of the supporting mechanism, relieving the friction plates of a portion of their load, thereby decreasing the frictional resistance. The intensity of the assistance offered by the floating mechanism to the pulling of the front part of the boiler around a curve with the truck, may be varied at will by adjusting the compression of the spring by means of the supporting nuts.

The operation of the locomotives to date has been most satisfactory, the last of the series having been delivered some time ago. From observations made on experimental engine, it is expected that they will be able to handle trains up 700 tons alone.

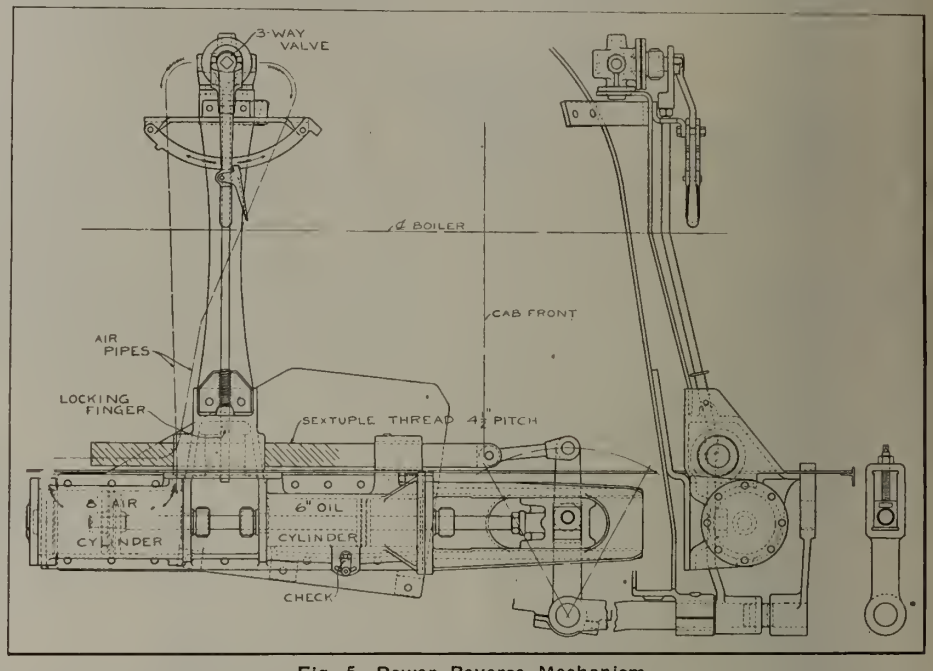


Fig. 5—Power Reverse Mechanism.

Prevention of Locomotive Boiler Explosions.

For the prevention of boiler explosions due to low water, which is the commonest cause of such catastrophies, the Southern Pacific Lines have a low water alarm of their own design in use on a number of locomotives. This alarm consists of a small cast-iron chamber of mercury, integral with a surrounding chamber communicating at the bottom directly with the boiler at the level below which it is deemed inadvisable for the water level to drop. This space under normal conditions, fills with water from the boiler, this water cooling to much below boiler pressure, due to the unlagged surface of this cylinder. The inner mercury chamber communicates with a cylinder above, a packed piston in the latter resting on the mercury. The upper end of the piston bears on a steam valve. When the water in the boiler drops below the predetermined level, the water chamber empties, allowing live steam to enter, heating the inner chamber of mercury, which on expanding raises the piston, opening the steam valve. This steam valve communicates with a steam whistle, and in oil-burning engines with an oil-control lever, and in coal-burning a firebox sprinkler for dampening the fire.

The heaviest locomotives in service are the Mallet compounds of the 2-10-10-2 class on the Atchison, Topeka and Santa Fe Ry., which weigh 308 tons (without tender) and have 225 tons on the driving wheels. Each group of five driving axles has a wheelbase of 19 ft. 9 in. The heaviest ordinary locomotives are the 2-10-2 engines of the same road, which weigh 143 tons (without tender), with 117 tons on the driving wheels and a driving wheel-base of 19 ft. 9 ins.

Railway Mechanical Methods and Devices.

Locomotive Netting Machine at G. T. R. Battle Creek Shops.

In the accompanying illustration a machine for the working of locomotive smoke-box netting at the Grand Trunk Ry. shops at Battle Creek, Mich., is shown. The customary method of cutting off sections for the locomotive netting is for three or more men to unroll the netting while another severs it along a marked line with a cold chisel. This is not only a slow operation, but also damaging to the fabric not only in the immediate neighborhood of the cutting, but also further back on the roll.

Machine for Shearing off Locomotive Smoke Box Netting.

In the device shown, the roll as it comes from the manufacturers is mounted on a drum supported on stands at the rear of the machine; these stands are integral with the base castings. The netting, taken off from the underside of the roll, passes between rollers to the front part of the machine. One of these rollers is provided with a ratchet arrangement as indicated, for the purpose of feeding the netting through. In the front of the machine it passes between two heavy steel cross bars, the lower one of which has an inset shearing knife edge on its upper forward edge.

The upper cross bar, which has a ratchet tooth surface on its upper face, carries the air-driven shearing apparatus. The front part of this apparatus is a three-layer structure down through which a shearing blade operates. This blade is actuated by a cam between the front and rear of these three plates, bearing down upon the upper face of the cutter. The spring in the front brings the cutter back after each stroke. Power is transmitted from the air motor to the pinion, and through the gear to the cam shaft.

Another cam on the cam shaft, shown just back of this three-layer body, actuates the feed mechanism. In its rotation it carries a sliding bar from side to side, a dog on one end engaging the ratchet surface, feeding across between cuts.

We are indebted for the above information to J. T. McGrath, Superintendent of Rolling Stock, Chicago and Alton Rd., who had the machine constructed when he was Master Mechanic of the G.T.R. Battle Creek shops.

Electric storage battery locomotives have been proposed by T. A. Edison for operating the Illinois Central Ry. suburban traffic at Chicago. Some experiments are to be made with his storage-battery motor cars, but single cars could not handle the traffic, and the suggestion was made to equip a train with a storage-battery tender to furnish the necessary power.

Reconstructing Postal Baggage Cars at Central Vermont Ry. Shops.

The United States Post Office Department's Railway Mail Service has laid down standard specifications covering the construction of postal cars. To meet the requirements called for, the Central Vermont Ry. is remodelling at its St. Albans, Vt., shops a number of old combination postal baggage cars. One of these, in process of conversion, is shown in the accompanying illustration.

These cars, 51 ft. long, of an all-wood body construction, were originally built with the usual short open vestibule. In the reconstruction these vestibules are first of all cut off, and a new end structure built up, reinforced with steel. The end sill is composed of two pieces. The inner section, composed of a thoroughly seasoned piece of white oak, 3½ by 8½ ins., is covered with a steel plate ¾ by 8 ins. the full width of the car as indicated. A similar plate ¾ by 7 ins., the full width of the car across the top in the location indicated, forms the upper reinforcing member.

Re-constructing Postal Baggage Cars, Central Vermont Ry.

Each side of the door opening, and bolted to the cross top and bolted plates on its flattened end, there is a piece of 60-lb. rail. The intervening space between this rail and the side of the car is filled with three ¾ by 3½ in. rectangular bars between top and bottom, twisted at both ends to present the greatest strength for end impact. To these pieces the wooden studding is attached, on to which the sheathing is nailed.

The third member of the end sill is another piece of thoroughly seasoned white pine 4½ by 8½ ins. secured outside the metal cross strip. Built up over top of this is the diaphragm made up of 7 by 9-in. oak, faced with 5 by ½-in. plate.

The centre sill of the car is reinforced by two strips of steel 8 by ½ in. extending back 18 ft. from the end of the car, secured on each side of the sill. These changes added to the car make a very solid construction.

Boiler Tube Cleaner for Removing Scale and Rust by Tumbling.

Boiler Tube Cleaner at the Pere Marquette Railroad Shops.

For cleaning the tubes that have been removed from the locomotive boiler for re-ending, the Pere Marquette Rd. in its shops at St. Thomas, Ont., has recently built a tumbling machine which, although extremely simple in construction, has proved very effective in performing this class of work.

As will be seen from the accompanying illustration, there are two cast end pieces, each with a trunnion for supporting the mechanism. The body of the tumbler consists of a number of channels set into cast recesses in the trunnioned ends, and to which they are bolted. The individual channels are kept a short distance apart by cast-iron separators through which pass the rivets holding the body in a solid unit.

The trunnioned end pieces have cast teeth in the periphery meshing, with a pinion on a long jackshaft, thereby driving both ends of the machine, putting no twisting strain in the body. A tight-and-loose pulley arrangement on this shaft delivers power by a belt from a drive-shaft inside the blacksmith shop, outside of which the machine is located.

For the introduction and removal of the tubes, one of the channels is hinged to the adjoining one, and locked to the other side. In service the tumbler is filled half full of tubes, and the mechanism set in motion for several hours. This operation completely removes the accumulated scale and rust, leaving the pipes clean for re-ending and trimming.

Mounting and Dismounting Steel Tires at the C. P. R. Angus Shops.

In the tender department of the C.P.R. Angus shops, Montreal, some ingenious methods have been devised for the rapid mounting and dismounting of steel tires from tender truck wheels, in a manner that is both economical and mechanically efficient.

Customarily, truck wheels when they come into the shop for new tires have the bolts that hold the retaining ring in place so badly burred up from various causes that it is usually necessary to cut them off with a chisel, they being generally considered of no further value except for scrap or else requiring so much work to reclaim as to make such a procedure unprofitable.

A method of removing the bolts in such a way as to reclaim them for further use has been devised in these shops, the tool employed being that shown in fig. 1. The old truck wheels, mounted on their axles, are brought into the shop on special tracks, which are

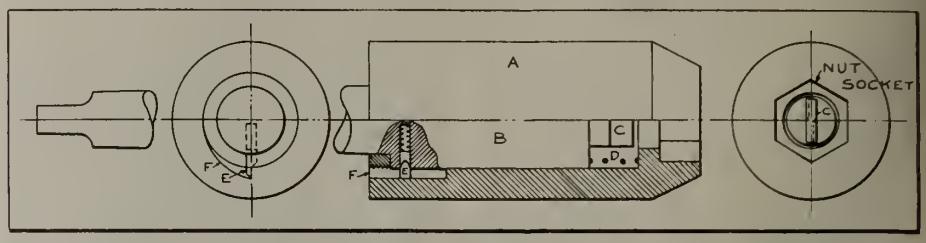


Fig. 1—Tool for Removing Burr from Bruised and Damaged Bolts and Nuts, and Unscrewing.

equipped at short intervals with stationary air jacks as indicated in fig. 2. Another of these air jacks is to be seen in the background. These air jacks are provided with cross arms, each carrying four small rollers, on which the truck wheel axle rests when jacked up to the position shown in fig. 2. The wheels in this location are in a convenient position to have the bolts worked upon. The apparatus for holding the burring and unscrewing tool is supported from a jib crane over the jacked up wheel. This will be explained later.

The burring and unscrewing tool, shown in fig. 1, consists essentially of a body A with nut socket lower end mounted on a tapered shank bar B, the lower end of which is hardened and ground to the form of a square-faced flat drill as at C. Normally the bar B is held in the upper end of barrel A by a spring D. B is free to revolve in a right-hand direction in barrel A, but it is prevented from revolving in a left-hand direction by spring pin E engaging in key way F. The nut socket end of barrel A is slipped on to the burred nut to be removed. The driving air motor is then operated in a right-hand direction, the cutter C being forced forward against the end of the bolt and nut, removing the damaged surface. During this operation the barrel A is stationary. When a sufficient amount of burred surface is removed, the air motor is reversed, the key E causing the whole tool to turn in a left-hand direction, unscrewing the nut from its bolt. The heads of both nut and bolt are thereby left in excellent condition for further use, instead of necessitating scraping as in the usual manner.

The method of applying this tool is shown in fig. 2. The air motor is supported in a carriage sliding in guides attached to the round horizontal bar shown. This bar is in turn suspended from a wall jib crane. A small pinion on the air motor carriage engages with a rack along the surface of the guiding ways, a handle attached to the former forcing the air motor into operation in the manner previously explained.

Following this bolt-removing operation, the wheels are pressed off the axles, and the tires taken off in the usual manner.

The next operation of interest is the mounting of new tires on the old centres. The method familiar to all is to heat the tire with an encircling gas or oil burning ring, and then drop the heat-expanded tire on to the centre piece to shrink in cooling. A new adaption of this method is here used, the heating apparatus for which is shown in fig. 3.

The tires to be heated—six at a time is the normal capacity of this heater—are placed in a pile on a brick base as indicated in the illustration, fig. 3. An oil burner on the end of pipe line A impinges into the combustion chamber B, the necessary supply of air being obtained from the compressed air connection C. The combustion chamber is the enlarged end of the bent-neck casting, the heat of combustion being carried along and down into the pile of tires. The brick base, on which the tires are piled, is hollowed at the centre, so that

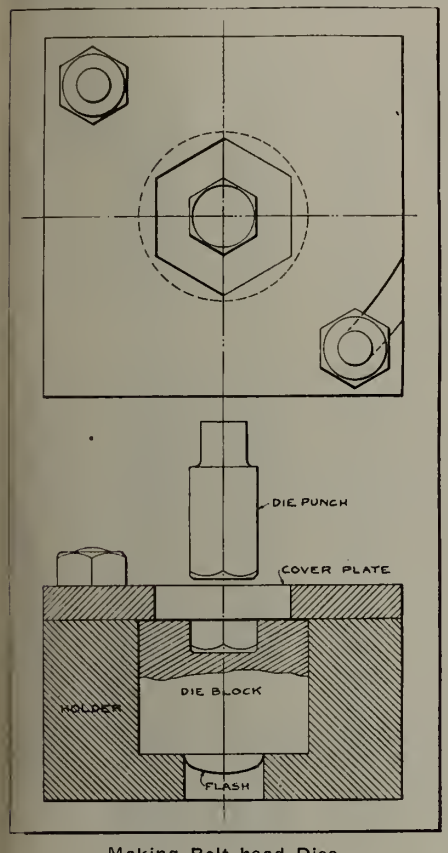
Fig. 2—Method of Operating the Burr-removing Tool.

Fig. 3—Stand for Heating a Batch of Steel Tires.

Fig. 4—Steel Tires after Receiving their Steel Centres.

Fig. 5—Jig for Holding Tires while Bolting in Retaining Ring.

the downwardly impinging hot gases are deflected so as to rise along the inner surface of the surrounding tires, escaping at the top. To prevent the too rapid escape of heat from the top of the pile of tires, a circular plate of steel of the diameter of the tires is attached to the downward pipe of the combustion cham-



Making Bolt-head Dies.

ber casting. This plate is lined with asbestos to enable it retain heat the better.

Around the outside of the pile there is a bent piece of sheet iron, D, to reduce radiation as much as possible. The efficiency of the device may be judged from the heating capacity, a set of six tires requiring only about 20 minutes. The lower tire, of course, is heated more than the rest, a fact which consideration will show to be an advantage, it being the last tire to be removed from the pile.

The heating apparatus, carried on a cast-iron bracket from a vertical post, is counterbalanced by a weight E, so that it may be raised or lowered at will. A set screw engaging in a channel in the post prevents the apparatus from swinging out of a central position.

While the tires are heating, six pairs of blocks are arranged around on the floor within crane swing of the heating stand, the blocks being shown in fig. 4. As soon as the tires reach the desired heat they are in quick succession lifted off the pile and placed each on a pair of the previously arranged blocks, flanges up. As each tire is located, the corresponding centre is immediately dropped into the awaiting hot tire, where it quickly cools, giving the desired shrinkage fit.

The next operation is that of bolting on the retaining ring which is shown leaning against the assembled tire and centre in fig. 5. The manner of performing this job is a material advance on the old method of loosely mounting on a wooden rod, 6 or 8 ft. long, in the manner familiar to all. In this new method the tire is held by screws from the back, two formed holders A, fig. 5, as shown. These grips, or holders, are trunnioned as at B, in vertically adjustable stands C, adapted to accommodate a wide range of sizes. Being trunnioned in this manner, the wheel held, may be swung over into the most convenient position for the operator, the bolts being put through from one side, the whole swung over, and the nuts put on from the other.

Since these photographs were taken, a further refinement in this last device has been introduced. In the positions shown in fig. 5, some little difficulty was experienced in, first of all, placing the tired wheel in the trunnioned grips, as the stands would slip apart. In the present arrangement one of the stands is bolted rigidly to the floor, while the other is mounted on a hinged plate which can be swung back for the introduction of the wheel, and when swung again into normal position the grips fit on to the flanges on both sides.

Nothing now remains but to mount the wheels on their axles in the normal manner by a hydraulic wheel press, the wheels again being ready for use.

Making Bolt-head Dies at Montreal Locomotive Works.

The diesinker at the Montreal Locomotive Works, A. Bonenfant, has devised and is using a rather ingenious method for making bolt head dies for use in the upsetting machine.

The customary method, of course, is to first drill the die blank, then cut out the hole to a hexagonal or square shape as desired, and following this, fit into the bottom of this formed hole, a heading piece containing the chamfered edges, to give the top of the head the requisite shape. All this requires rather careful diesinking, and as the wear and tear on upsetting dies is heavy, the maintenance charge is kept at a high figure.

The method used by Mr. Bonenfant is simple in the extreme. The die blocks for a given machine are all of the same size, so one holder with cover plate suffices for the production of all the dies used for bolt-heading on one machine. This holder and cover with contained die block are shown in the accompanying illustration. A set of die punches of various sizes and of the shape indicated are used in conjunction with the holder.

The holder is gripped centrally in the stationary part of the upsetting machine and the die punch lined up in the ram. The die block heated to a working heat, is then located in place in the holder, and the cover swung into place. The ram then coming forward, as in any upsetting job, forces the die punch into the die block, quickly forming the die header. The surplus stock is forced out in a "flash" through a hole in the bottom of the die holder.

The die block thus produced is still a little rough, especially at the upper surface, where the edges are somewhat "drawn." The hole is forced slightly deeper than necessary to make provision for trimming this down. Likewise, the flash is faced off.

After the necessary tempering, the die is ready for service, a good die being produced at very small cost as compared to the usual method. All the bolt dies now used at these works are produced by this method, with very satisfactory results attending their use. They are quite as good as the built up dies.

Bay of Quinte Ry.—The trustees under a mortgage dated Jan. 2, 1902, to secure an issue of bonds of $1,000 each, on Feb. 20, redeemed 50 of the bonds, the numbers of which were decided by lot, at 105 and accrued interest, out of the sinking fund.

Repairing Air Hose at the Intercolonial Ry. Moncton Shops.

It would seem as if there was no end to the number of different devices and modifications of well known devices for the repair and renewing of air hose. One arrangement has already been described in these columns, but the device shown in the accompanying illustrations is so different in construction as to warrant another description.

In the Michigan Central Rd. method, as outlined in The Railway and Marine World for Dec., 1911, there was but one horizontal cylinder, whereas in this device the rubber hose is itself held stationary by a clamp from above, very similar to the one described in the article mentioned, while the end connections are forced on by an air cylinder at each end. The principal feature of distinction in this mechanism lies in the cylinder under the bench and the functions it performs.

Instead of first removing the air hose with its forced-on end pieces for the purpose of squeezing up the hose clamps in a pneumatic vise, the hose is held in its last position, while the hose clamps are loosely slipped on. A cross bar at-

Mechanism for Renewing Air Hose at One Setting.

tached to the plunger rod of the lower cylinder connects at each of its ends to a pincer arrangement like a pair of ice tongs, so designed that as the plunger rises these tong fingers encircle the hose clamp, forcing it tight on to the hose. The bolt is then introduced and tightened up, completing the whole operation in one setting. The operation of the mechanism is clearly outlined in the accompanying illustration.

Michigan Central Rd.—Lake Shore and Michigan Southern Ry.—The New York Central and Hudson River Rd., which controls the above named railways, has sent a circular to the holders of the 3½% gold bonds, secured by shares of the Lake Shore and Michigan Southern Ry. and Michigan Central Rd. as collateral, asking their consent to a plan of merger of either or both of these roads with the New York Central and Hudson River Rd. Co.

The Bank of Montreal will open a branch in the C.P.R. Windsor St. Station, Montreal, as soon as the addition to the building is completed.

Steam Railway Statistics for Year Ended June 30, 1911

In the following table the column headed gross earnings includes passenger and freight earnings, as well as miscellaneous earnings; the next four columns give the operating expenses classified under their various headings, while the last gives the net earnings, which are arrived at by deducting the totals of the four columns referred to from the figures in the gross earnings column. The minus mark (—) before figures in the net earnings column shows that there was a deficit in the operations of the line to the extent of the figures given. The numbers in brackets—thus (1)—after the name of a railway refer to notes on page 111. The cents have been omitted in all cases, and the figures in the totals show the aggregate earnings, etc., including the cents, omitted from the detailed items.

Name of Railway	Mileage	Passenger Earnings	Freight Earnings	Gross Earnings	Maintenance of Way and Structures	Maintenance of Equipment	Traffic and Transportation Expenses	General Expenses	Net Earnings
Alberta Ry. & Irrigation Co. (1)	111.82	$ 102,376	$ 214,353	$ 345,121	$ 80,993	$ 25,425	$ 116,759	$ 26,471	$ 95,472
Algoma Central & Hudson Bay (2)	89.64	93,538	331,665	578,699	112,869	65,761	158,159	28,611	213,297
Algoma Eastern (2)	22.70	1,961	95,201	98,621	11,926	13,574	29,536	8,831	34,751
Atlantic, Quebec & Western (3)	52.25	9,306	15,142	24,475	11,633	1,413	16,076	2,928	—7,576
Bay of Quinte (7)	89.39	44,128	165,536	216,042	29,247	23,684	96,283	8,644	58,182
Bedlington & Nelson (4)	15.30	249	1,822	2,072	8,387	436	982	867	—8,601
Bessemer & Barrys Bay (26)	5.00								
Brandon, Sask. & Hudson Bay (4)	69.45	27,876	37,206	65,367	36,394	10,968	45,478	4,014	—31,488
British Yukon (5)	101.12	63,752	252,067	321,365	43,950	14,453	49,806	11,568	201,586
Brockville, Westport & N.W. (7)	45.00	34,719	32,744	67,503	11,090	3,249	20,345	2,805	30,012
Bruce Mines & Algoma (27)	17.28								
Canada Southern (19)	380.04	2,827,030	6,315,307	9,169,359	1,028,417	1,120,660	3,225,777	170,031	3,624,471
Canadian Government Railways									
Intercolonial (6)	1,450 37	3,361,984	6,479,229	10,021,568	1,758,850	2,264,770	5,486,720	229,348	281,877
Prince Edward Island	269.33	187,281	144,444	342,585	119,015	84,995	212,408	14,027	—87,861
Canadian Northern (7)	3,687.70	3,214,893	11,955,363	16,360,712	2,361,956	2,092,237	6,132,600	446,897	5,327,020
Canadian Northern Ontario (7)	342.90	172,351	382,544	563,390	114,981	88,708	307,137	30,212	22,350
Canadian Northern Quebec (7)	368.81	326,186	743,662	1,080,929	240,737	120,033	572,207	42,636	105,314
Canadian Pacific (8)	10,210,30	31,117,880	64,822,980	97,599,083	15,561,086	12,056,260	34,160,799	1,849,147	33,971,789
Cape Breton	31.00	5,171	3,514	8,768	6,383	1,680	7,723	2,423	—9,443
Caraquet	84.78	19,759	35,289	55,048	16,819	7,061	24,690	6,274	202
Carillon & Grenville	13.00	1,515	79	2,856	1,761	1,125	1,888	37	—1,955
Central Ontario (7)	149.73	92,607	209,939	314,105	52,223	17,571	93,446	7,279	143,584
Crows Nest Southern (4)	74.18	23,927	114,215	139,056	81.684	26,235	74,240	8,518	—51,621
Cumberland Ry. & Coal Co. (22)	32.00	16,860	38,499	55,377	14,708	4,368	29,587	4,678	2,034
Dominion Atlantic (9)	278.87	391,318	340,578	736,011	111,588	58,657	287,697	39,272	238,796
Eastern British Columbia	16.00	3,875	34,251	38,177	7,839	2,522	11,348	892	15,575
Elgin and Havelock	28.00	3,368	7,620	10,988	4,321	760	4,502	796	606
Grand Trunk (11)	3,094.96	11,369,825	21,102,974	32,800,078	4,215,547	5,601,224	12,504,762	827,599	9,650,943
G.T.R. (Canada Atlantic) (11)	456.26	468,209	1,431,990	1,935,928	348,565	299,881	1,007,689	61,683	218,107
Grand Trunk Pacific (10)									
Halifax & South Western (7)	377.87	219,639	213,556	435,810	113,984	44,749	218,158	20,167	38,750
Hereford (12)	52.18	19,182	42,008	62,087	28,992	14,007	43,522	4,256	—28,691
Internat'l Ry. of New Brunswick (13)	113.50								
Inverness Ry. & Coal Co. (7)	60.91	25,380	170,470	207,229	29,807	26,639	50,076	7,516	93,189
Irondale, Bancroft & Ottawa (7)	51.00	8,555	17,040	26,042	10,817	1,009	11,447	1,488	1,279
Kaslo & Slocan (4)	23.37	569	5,226	5,865	1,375	1,324	3,343	771	—950
Kent Northern	27.00	8,526	10,313	18,839	5,368	1,500	4,550	2,000	5,421
Kettle Valley	22.20	372	2,627	3,019	3,722		1,832	644	—3,179
Kingston & Pembroke (8-14)	109.80	65,501	148,815	207,280	57,608	21,367	76,972	9,308	42,023
Klondike Mines	31.81	7,304	38,793	47,302	14,072	1,997	16,520	11,917	2,793
London & Port Stanley (15)	23.66	39,226	80,384	120,694	15,293	20,482	96,646	5,408	—17,436
Lotbiniere & Megantic	30.00	6,531	24,258	30,886	9,996	2,865	9,800	7,642	582
Maganata wan River (11)	1.91								
Manitoba Great Northern (4)	91.77	6,548	43,984	50,587	26,517	4,285	34,612	3,603	—18,432
Maritime Coal Ry. & Power Co.	15.00	8,379	63,546	71,926	8,622	8,114	24.258	2,025	28,906
Massawippi Valley (16)	35.46	70,788	138,034	210,104	41,601	22,161	109,427	3,650	33,263
Moncton & Buctouche	34.00	9,784	16,317	26,169	8,604	2,291	8,209	3,967	3,095
Montreal & Atlantic	163.40	221,512	811,763	1,055,613	293,715	111,658	428,266	27,940	194,033
Montreal and Province (11)	58.60	60,382	54,211	116,345	23,159	5,730	37,391	1,893	48,171
Montreal & Vermont Jct. (11)	23.60	65,162	60,068	125,261	14,056	10,859	45,876	4,616	49,853
Morrissey, Fernie & Michel (17)	10.85	9,369	98,293	108,294	16,988	13,871	42,630	18,721	16.084
Napierville Jct. (21)	27.06	5,767	66,266	72,347	6,150	2,988	25,920	1,651	35,636
Nelson & Fort Sheppard (4)	55.42	33,555	42,478	80,002	79,373	7,711	48,345	7,891	—63,319
New Brunswick Coal & Ry. Co. (18)	58.00	13,216	40,747	66,476	25,025	17,550	27,721	10,469	—14,288
New Brunswick & P.E.I.	36.00	10,999	21,708	32,804	9,935	4,586	10,744	1,843	5,694
New Westminster Southern (4)	23.73	14,057	29,805	44,027	9,436	3,174	13,893	2,420	15,102
North Shore	8.63	238	3,193	3,431	890		2,279	53	208
Nosbonsing & Nipissing (27)	5.50								
Nova Scotia Steel & Coal Co.	12.50	2,203	3,871	6,074	3,566	494	5,920		—3,906
Ottawa & New York (19)	56.90	72,996	81,570	156,677	43,353	20,476	87,039	8,885	—3,078
Pere Marquette (15)	198.81	161,037	2,286,241	2,456,882	282,686	405,484	928,855	60,452	779,403
Phillipsburg Ry. & Quarry Co.	6.00		5,677	5,677				3,110	2,567
Pontiac and Renfrew (27)	4.25								
Princeton Branch W.C. Ry. (12)	5.10	7,839	19,777	27,616	1,906	2,470	7,026	318	15,894
Quebec and Lake St. John Ry. (7)	286.50	233,643	386,978	630,611	128,675	110,044	313,838	34,532	43,520
Quebec Oriental	253.00	407,221	788,439	1,204,172	157,062	135,329	455,614	72,796	383,369
Quebec, Montreal and Southern (21)	191.91	131,248	185,610	317,397	67,917	64,666	153,191	14,914	16,707
Quebec Central (3)	100.00	38,034	47,922	85,956	30,702	9,104	37,735	6,528	1,886
Quebec Ry., Light and Power Co. (20)	27.00	9,921	56,522	68,903	7,249	7,935	27,463	6,223	19,986
Red Mountain (4)	9.59	3,624	10,829	14,853	24,846	2,010	16,021	1,471	—29,495
Rutland and Novan	3.29	9,735	5,762	15,498	1,186	1,946	5,920	510	5,933
Salisbury and Albert	45.00	11,079	16,778	28,305	13,607	4,831	11.101	2.088	—3,323

(*Continued on page 111*)

Steam Railway Statistics for Year Ended June 30, 1911—*(Continued from page 110)*

Name of Railway	Mileage	Passenger Earnings	Freight Earnings	Gross Earnings	Maintenance of Way and Structure	Maintenance of Equipment	Traffic and Transportation Expenses	General Expenses	Net Earnings
Schomberg and Aurora (7)	14.40	$ 5,373	$ 6,200	$ 11,613	$ 5,135	$ 1,026	$ 8,021	$ 334	$ — 2,904
Stanstead, Shefford and Chambly (11)	43.00	39,713	49,588	89,603	30,308	2,168	44,782	1,885	10,457
St. Clair Tunnel (11)	1.13	.....	293,014	293,014	34,512	12,861	54,882	3,203	187,555
St. Lawrence and Adirondack (19)	46.12	234,664	325,020	565,759	74,622	33,900	253,939	9,838	193,457
St. Martins	30.00	5,547	9,429	15,194	3,774	1,407	6,355	1,087	2,569
Sydney and Louisburg (22)	64.06	35,581	418,884	455,710	66,818	98,574	188,520	17,039	84,709
Temiscouata	113.00	65,073	141,190	211,113	48,072	30,707	69,795	13,606	48,932
Temiskaming and N. Ontario (23)	294.78	624,562	803,331	1,490,251	352,501	145,806	825,948	78,362	387,632
Thousand Islands	6.33	11,828	22,221	37,181	4,163	2,902	21,893	3,822	4,400
Toronto, Hamilton & Buffalo (19)-(24)	80.15	333,998	860,076	1,206,090	140,832	90,540	421,983	29,085	523,687
Vancouver Copper Co. (27)	12.00	.....	.....	.....	.....	.....	.....	.....	.....
Vancouver, Victoria and Eastern (4)	219.40	232,912	446,948	690,620	216,233	66,582	319,423	25,418	62,962
Victoria and Sidney (4)	15.97	25,057	29,120	54,321	9.049	3,098	18,446	3,115	20,611
Victoria Terminal Ry. & Ferry Co. (4)	0.91	2,428	2,228	4,788	597	212	1,264	209	2,503
Wabash (25)	.....	697,697	1,701,617	2,402,010	246,122	514,323	1,116,342	89,776	435,448
Wellington Colliery Co. (27)	10.75	.....	.....	.....	.....	.....	.....	.....	.....
York and Carleton	10.50	2,466	3,379	5,845	1,447	115	2,232	51	1,998
	25,399.86	58,317,998	126,570,533	188,733,493	29,245,093	26,127,638	71,175,014	4,487,039	57,698,709

Notes to Steam Railway Statistics.

(1) The Alberta Ry. and Irrigation Co. was operated under the control of the C.P.R. during the year, and has since been taken over in its entirety by that company. It includes the railways formerly owned by the Alberta Ry. and Coal Co., and the St. Marys River Ry.

(2) The Algoma Central and Hudson Bay Ry. and the Algoma Eastern Ry. (formerly the Manitoulin and North Shore Ry.) are owned by the Lake Superior Corporation.

(3) The Atlantic, Quebec and Western Ry. is operated by the same interests as the Quebec Oriental Ry., which was originally the Baie des Chaleurs Ry., and subsequently known as the Atlantic and Lake Superior Ry. The A.Q. and W. Ry. has trackage rights over 1.75 miles of the lines of other companies.

(4) The Great Northern Ry. owns and operates the following lines in Canada: Brandon, Saskatchewan and Hudson Bay Ry.; Manitoba Great Northern Ry.; Crow's Nest Southern Ry.; Red Mountain Ry.; Nelson and Fort Sheppard Ry.; Vancouver, Victoria and Eastern Ry. and Navigation Co.; New Westminster Southern Ry.; Victoria Terminal Ry. and Ferry Co.; and Victoria and Sidney Ry. The Manitoba Great Northern Ry. has trackage rights over 0.99 mile of another company's line. The Bedlington and Nelson Ry. mileage includes 8.67 miles operated under lease. The Nelson and Fort Sheppard Ry. mileage includes 5.42 miles of leased lines. The New Westminster Southern Ry. and the Vancouver, Victoria and Eastern Ry. have each trackage rights 1.48 miles over the Fraser River Bridge owned by the British Columbia Government.

(5) The British Yukon Ry. is the Canadian portion of the line operated as the White Pass and Yukon Route, connecting with steamboats on the Yukon River to Dawson in the summer, and with stages in the winter.

(6) The Intercolonial Ry. mileage does not include the Windsor branch 32 miles, operated by the Dominion Atlantic Ry. It has 16 miles of second track. It operates its trains into Montreal over the G.T.R., its trackage rights over foreign lines being 40.36 miles.

(7) Mackenzie, Mann and Co., Ltd., interests own or control and operate the following railways: Bay of Quinte Ry.; Brockville, Westport and North Western Ry.; Canadian Northern Ry.; Canadian Northern Ontario Ry.; Canadian Northern Quebec Ry.; Central Ontario Ry.; Halifax and South Western Ry.; Inverness Ry. and Coal Co.; Irondale, Bancroft and Ottawa Ry.; Quebec and Lake St. John Ry. and Schomberg and Aurora Ry. The Bay of Quinte Ry. has trackage rights over 19 miles of another company's lines. The Central Ontario Ry. operates the line owned by the Marmora Ry. and Mining Co. (formerly the Ontario, Belmont and Northern Ry.). The Toronto-Ottawa section of the C.N.O.R. connects with the Central Ontario Ry. at Trenton, and runs over the B. of Q. Ry. between Deseronto and Sydenham. The Irondale, Bancroft and Ottawa Ry. connects with the C.O.R. near Birds Creek. The Canadian Northern Ry. figures include the statistics relating to traffic over the Manitoba Ry., which it operates under a lease from the Government of Manitoba. The lines included in the Manitoba Ry. are the Northern Pacific and Manitoba Ry., Winnipeg Transfer Ry., Portage and North Western Ry., and Waskada and North Eastern Ry. The Canadian Northern Quebec Ry. has trackage rights over 58.65 miles of other companies' lines. The Canadian Northern Ontario Ry. has trackage rights over 3.80 miles into the Union Station, Toronto. The Halifax and South Western Ry. has 2.30 miles of trackage rights over the Intercolonial Ry. into Halifax.

(8) The Canadian Pacific Ry. mileage includes 2,909.60 miles of main lines owned, 3,103.20 miles of branches and spur lines owned; 2,623.60 miles of lines of proprietary companies; 1,389.90 miles of lines operated under lease; 184 miles of lines operated under contract, and 37.30 miles of lines operated under trackage agreements. It has 451.70 miles of second track, on lines owned, and 165.80 miles on leased lines. The C.P.R. returns include the earnings and expenses of the Esquimalt and Nanaimo Ry. The lines operated by the C.P.R. include the Montreal and Atlantic Ry., which has 6.40 miles of second track, and a leased line—Lake Champlain and St. Lawrence Junction Ry. The C.P.R. also owns with the New York Central and Hudson River Rd., the Toronto, Hamilton and Buffalo Ry., and controls the Kingston and Pembroke Ry., which continues to report independently.

(9) The Dominion Atlantic Ry. operates under agreement the Windsor branch of the Intercolonial Ry., 32 miles, which is included in the D.A.R. mileage, but not in that of the I.R.C. It has also trackage rights over 14.42 miles of other lines. The D.A. Ry. has since passed under C.P.R. control, and is, since Jan. 1, being operated by it under lease, but a separate organization is maintained.

(10) The Grand Trunk Pacific Ry. is reported to be under construction, although it is being operated from Winnipeg to beyond Edmonton.

(11) The G.T.R. mileage includes the Buffalo and Lake Huron Ry., 161.30 miles, leased and partly owned. The G.T.R. figures include the earnings, etc., of the Magnetawan River Ry. It has 706.81 miles of second track, and has trackage rights over other lines totaling 13.71 miles. It also owns the Canada Atlantic Ry. and the St. Clair Tunnel Co., which report separately, and the G.T. Pacific Ry. The Central Vermont Ry., which operates the Montreal and Province Line; the Montreal and Vermont Jct. Ry. and the Stanstead, Shefford and Chambly Ry.

(12) The Hereford Ry. is owned and operated by the Maine Central Rd., which also owns the Princeton branch, Washington County Ry.

(13) The International Ry. of New Brunswick was originally known as the Restigouche and Western Ry. It was not being operated when the returns were sent in.

(14) The Kingston and Pembroke Ry. passenger and freight earnings are in excess of the amount given in the column headed gross earnings, the difference being that $7,035 marked "Cr" in the account of earnings other than from operation has to be deducted before the gross earnings can be ascertained.

(15) The London and Port Stanley Ry., practically owned by the city of London, Ont., is leased to the Lake Erie and Detroit River Ry., which is owned and operated by the Pere Marquette Rd., a U.S. company. The P.M.R. has trackage rights over 136.57 miles of other Canadian lines.

(16) The Massawippi Valley Ry. has trackage rights over 2.95 miles of another company's lines. It is operated by the Boston and Maine Rd.

(17) The Morrissey, Fernie and Michel Ry. includes 5.03 miles of leased lines. It is owned by the Crow's Nest Pass Coal Co.

(18) The New Brunswick Ry. and Coal Co. is operated by a commission appointed by the New Brunswick Government.

(19) The New York Central and Hudson River Rd. owns the Ottawa and New York Ry., and the St. Lawrence and Adirondack Ry. It also controls the Toronto, Hamilton and Buffalo Ry.; the Rutland Rd., which owns the Rutland and Noyan Ry.; and the Michigan Central Rd., which controls the Canada Southern Ry. This line has 226.18 miles of second track on main lines, and 16.80 miles of second track in branches and spurs. The Ottawa and New York Ry. operates 1.90 miles under trackage rights. The St. Lawrence and Adirondack Ry. mileage includes 13.30 miles of leased lines, and it has also trackage rights over 8.92 miles of other companies' lines.

(20) The Quebec Ry. Light and Power Co. reports as to the operation by steam over the old line of the Quebec, Montmorency and Charlevoix Ry. There

are 6 miles of second track and 3 miles operated under contract.

(21) The Quebec, Montreal and Southern Ry. includes the old East Richelieu Valley Ry., the United Counties Ry. and the South Shore Ry. It is owned by the Delaware and Hudson Co., which also owns the Napierville Jct. Ry.

(22) The Sydney and Louisburg Ry. is owned by the Dominion Coal Co. It operates 1.09 miles of line owned by a proprietary company and has trackage rights over 1.20 miles of other lines. It also owns the Cumberland Ry. and Coal Co.

(23) The Temiskaming and Northern Ontario Ry. is owned by the Province of Ontario and is operated by a Commission. It also owns the Nipissing Central Ry., an electric line.

(24) The Toronto, Hamilton and Buffalo Ry. is owned by the New York Central and Hudson River Rd., and the C.P.R. It has 4.16 miles of second track and has trackage rights over 4.36 of foreign lines.

(25) The Wabash Rd. does not own any track in Canada, but operates over G.T.R. tracks under lease.

The Bessemer and Barrys Bay Ry., the Bruce Mines and Algoma Ry., the Pontiac and Renfrew Ry., and the Vancouver Copper Co.'s railway are not being operated. The Nosbonsing and Nipissing Ry.. and the Wellington Colliery Co.'s line have apparently not reported.

PROPOSED LENGTHENING OF RAILWAY TIES.

Discussion by the Canadian Society of Civil Engineers.

The question of the best length for ties has been under the Canadian Society of Civil Engineers' consideration during the past two years. At the annual meeting in Winnipeg, in January, 1911, the chairman of the committee of ties, D. MacPherson, then Assistant Chief Engineer, National Transcontinental Ry., now Assistant to the Chairman, N.T.R. Commission, presented a report, from which some members of the committee dissented, arguing strongly in favor of longer ties than were in use, and suggesting experimental tests with ties 10½ ft. long. This report was published in full in The Railway and Marine World for March, 1911, together with the views of the dissenting members of the committee. As it was evident that there was considerable divergence of opinion on the question, we obtained the views of a number of leading railway engineers, roadmasters, etc., and published the same in our issues of April and May, 1911, the whole forming a valuable collection of opinions on a very important subject.

The committee's report that experimental tests be made with 10½ ft. ties does not appear to have been carried into effect.

In May, 1911, the Society's Secretary notified the members of the committee of their reappointment.

J. G. Sullivan, C.E., C.P.R. Western Lines.

Mr. Sullivan wrote Mr. MacPherson, June 5, 1911, agreeing to serve on the committee, and pointing out that in the committee's report above referred to "there was not only an error in figures, but also a very serious error in principles." Mr. Sullivan continued: "Leaving aside all the features that make it unnecessary to tamp under the centre of the ties, and assuming that it would be good railroading to so tamp ties (which, of course, I do not admit), the only place a tie is apt to break is under the rail or at the centre. Now, if you will figure up the strain, putting the moment at the centre of the tie equal to the moment underneath the rail, I think you will soon discover the error I allude to. To make the case a little more clear. Imagine the tie turned upside down, the rails a support, and the tie carrying a uniform load. I think you will find that theoretically the length of tie for a safe load is considerably less than 9 ft."

Mr. MacPherson's Reply

On July 20, 1911, Mr. MacPherson wrote Mr. Sullivan as follows:—"If all members of the committee, in addition to the interest they take in this matter, would show that interest as practically as you are doing, we should soon thresh out some useful information. We must, however, each be careful to try to look at the matter, not only from our own, but from the other fellow's point of view. I am quite willing to admit the words 'firmly tamped for its entire length,' may be misleading. It would be better to say tamped for its entire length in such a way as to give, as nearly as possible, uniform support, having regard

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D. MacPherson,
Chairman, Canadian Society of Civil Engineers' Committee on Ties.

to the distribution of the load, that is, tamped hard under the rail and for a distance say 18 ins. each way, from edge of rail base, and outer ends tamped more firmly than at centre of track. I have not entirely overlooked the principles of the bending moment you refer to, and agree with you that the moment is greater under the rail for a 10 ft. tie than for an 8 ft. tie, but it is less at the centre for the longer tie. Ties are more apt to break at the centre than under the rail, when frost is coming out, and that is about the only place and time good ties ever break, therefore, the lessening of the moment at centre should be an improvement. I have used 10 ft. and 12 ft. ties, with excellent results, over bogs and places where track could not be kept in surface or line with 8 ft. ties, and have never known a long tie to break under such circumstances. Does not this indicate that the bending moments in the tie may not be as important as providing an increased area of foundation for the immensely increased weights of recent years. Your illustration of turning the tie upside down, supported on the rails, and assuming load uniformly distributed, certainly facilitates calculation of the stresses, but unfortunately we know the load is not uniformly distributed, hence calculations based on that assumption are inconclusive. In any case, they only refer to the strength of the tie and not to its effectiveness in providing, as nearly as is possible uniform minimum unit pressures on the ballast. I will, in turn, make a suggestion to illustrate my point of view. Assume that the ties are sawn straight through in the centre and the spreading of the track taken care of by steel, the rods bolted to the rails. Would not the outer ends of 8 ft. ties be immediately crushed into the ballast and the inner ends be cocked up? Would this happen if ties were of equal length each side of rail, and if not, does it not prove that lengthening the ties is not altogether folly?"

Circular to Members of Committee.

In July, 1911, Mr. MacPherson sent the following circular to members of the committee:—"As the committee on ties has been continued from last year, with the understanding that only those who expressed a willingness to act need be considered as members, I would advise you that the men whose names appear on this letter have stated their readiness to act, which should assure a good live report for next annual meeting. Unless the majority of the members of the committee wish otherwise, it might be well to confine our work this year entirely to determining what, in our opinion, are the best dimensions for ties for a standard trunk line railway, and not go into tie preservation or cost at all. Of course the question of cost is very vital, but the first and most important things to determine are the proper dimensions to give the best results. I enclose copy of some correspondence between one member of the committee and myself, which may help to set the ball rolling, and I would ask each member to contribute something definite on the subject as early as possible, avoiding generalities and giving logical reasons for all theories advanced. As soon as all the members contribute something on the subject, I shall call a committee meeting, when we can exchange views more fully and perhaps evolve matter for further enquiry or discussion. In the meantime, I hope you will pitch into the two of us who have so far committed ourselves to paper and handle our theories without gloves, so long as you evolve something better or advance arguments which prove our points of view to be erroneous."

The members who consented to act on the committee were D. MacPherson, Chairman; F. P. Gutelius, H. G. Kelley, Wm. McNab, J. G. Sullivan, T. C. Burpee, H. A. Woods, M. H. MacLeod, W. A. Bowden, W. B. Mackenzie.

H. G. Kelley, Chief Engineer, G.T.R.

Mr. Kelley wrote Mr. MacPherson July 31, 1911, as follows:—I have read with interest the letter from J. G. Sullivan to you upon the subject of ties, and your circular letter to the committee. The matter seems to have been well studied from a mathematical point of view, yet without reaching a unanimous conclusion. I intend, therefore, in this letter, to discuss it purely from practical conclusions derived from experience and observation.

"Upon first class rock ballasted track with embankments and ballast, old and well settled, there is but little trouble with ties breaking. Upon good gravel track, well maintained, the breakage under the rail is more frequent than breakage in the centre of the track, except in the case of centre bound track. Upon unballasted or earth surfaces track, the breakage is about evenly divided; if

there is any difference, I believe the breakage under the rail is in excess. In the above three cases, I am considering track laid with the ordinary sized tie, 6 by 8 ins. by 8 ft. long. Would not the above indicate that so far as strength is concerned, the extension of an 8 ft. tie beyond the rail is already as long as it should be to balance the stress upon the middle of the tie?

"Upon all track, the primary object to be attained is drainage, and any type of construction which retards the drainage, injures the track and places a greater physical stress upon the ties.

"In the Southern States many years ago, where ballast was scarce, rains plentiful and track bad, a road running from Memphis, Tenn., to Little Rock, Ark., tried the experiment of using ties 9 ft. long. After a few years their use was abandoned as being a detriment to the track on account of the retarding of the drainage, and the company returned to the use of ties 8 ft. long. Other roads in the northern parts of the U.S. have used 9 ft. ties, but so far as I know, their use has been discontinued, and only in some instances have the roads adopted as their standard ties 8½ ft. long.

"In view of the above facts, I believe that the maximum length of the tie should not exceed 8½ ft., and that a tie 8 ft. long will answer all purposes for modern traffic, and enable the maintenance departments of railroads to maintain first class track. I believe, however, that ties 6 ins. thick are not sufficiently strong, and that ties for main line traffic should be 7 ins. thick by at least 8 ins. wide, but that in no case should they be more than 10 ins. wide."

H. A. Woods, Asst. Chief Engineer, G.T.P.R.

Mr. Woods wrote Mr. MacPherson, on Aug. 9, 1911: "I think the committee will agree that the ordinary tie 6 by 8 ins. by 8 ft. in length, with, as generally spaced, 22 in. centres, does not give sufficient bearing for the rolling stock now in use. To add to this bearing surface, shall we increase the length of the tie, as suggested in your report last season, or adopt some other conclusions. Evidently, there is a diversity of opinion as to the actual theoretical length of a tie for a safe load, and there will doubtless be a further discussion on that subject.

"Personally, I think the increased length suggested is hardly justified by past experience. Several railways in the U.S. at one time called for ties 9 ft. long, but I do not know of any using that length at the present time. The Pennsylvania Rd. and the New York Central, with some of its allied lines, are calling for ties 7 ins. by 7 ins. by 8½ ft. long. Would not this indicate, in a measure at least, that ties even 9 ft. in length were undesirable, either on account of additional cost, or difficulty in procuring them?

"In my opinion a 10 ft. tie, aside from the difficulty in procuring it, and the additional cost (which would be almost prohibitive), has other disadvantages, among which are increased breakage over the shorter tie, retarded drainage, and additional ballast required.

"Personally, I believe that ties should not be less than 7 ins. in thickness, 8 ins. on face, and 8 or 8½ ft. in length; that they should be laid with 20 in. centres, 20 to a 33 ft. rail length. Ties are so spaced on several railways at the present time. With this number of ties of the dimensions named, and with proper ballast, I believe that first class track can be maintained."

F. P. GUTELIUS, then General Superintendent, Eastern Division, C.P.R., wrote Mr. MacPherson Oct. 7, that he desired to put himself on record as being opposed to making ties more than 8 ft. long.

Report by the Chairman.

Mr. MacPherson wrote the Society's Secretary on Nov. 28, 1911, as follows:—

"I attach for the council's information copies of correspondence I have had in this connection, from which it will appear that only four out of the nine members have taken any part in the discussion, and that two of them are in favor of using ties not longer than 8½ ft.; one sticks to the 8 ft. length without, however, advancing any reasons to support his views. Under these circumstances it seems impossible to present anything that could be called a report of the committee, hence I submit the correspondence for such action as the council may deem advisable, and in doing so desire to say that this year's discussion, in my opinion, has not disclosed any definite or conclusive reasons to approve that ties shorter than 10 ft. meet the requirements of the standard modern track, required to support the immensely increased loads of up-to-date rolling stock.

"Perusal of the reports and discussions of the American Railway Engineering Associations' committee on ties for several years past will disclose the fact that many members of that association are of the opinion that longer ties are necessary, but that they hesitate to recommend the same definitely for fear of seeming to commit the roads they represent to large increases of expenditure. It would be equally logical to advocate using a 56 lb. rail for the same reason. The chief engineers of the London and North Western Ry., and of the Midland Railway, of England, inform me that their standard tie is 9 ft. long. These are two of the best maintained roads in the country, but their locomotives are probably not more than two-thirds the weight of the heavy locomotives used on this continent, and the axle loads are lighter in proportion.

"Ties 9 ft. long have been used in Texas over 30 years, with mud ballast, which would indicate that the advantage of increased bearing must more than offset the disadvantages of drainage, even in bad ballast, and these disadvantages would not be so great in gravel ballast.

"The Chief Engineer of the Louisville and Nashville Ry. informs me that they used 10 ft. ties with sand ballast, and had no difficulty with drainage, or trouble with ties breaking under the rail. They now use blast furnace slag for ballast in place of the sand, and their standard tie is 9 ft. long.

"Some ten years ago I had personal experience with a piece of track, about one-half mile long, over muskeg, on the C.P.R., which piece of track it was impossible to keep in surface or line with ties 8 ft. long. An experiment was tried with ties 12 ft. long, and that length of tie has been used there ever since with perfectly satisfactory results. The roadmaster recently informed me that he had no trouble with the long ties breaking, and that this summer he had treated another muskeg the same way, with the result that a half-mile of 7 mile section, which with 8 ft. ties had taken 50% of the time of the section gang to keep in order, had, since the placing of the 12 ft. ties, scarcely needed any attention, and remained in good surface and line.

"These examples would indicate that there is not much danger of 10 ft. ties breaking, and that they do give the much needed additional support.

"I am sending a copy of this letter to each member of the committee, but do not propose to submit any further formal report."

The matter came up at this year's annual meeting Jan. 26, but was not discussed, as it was decided to request all the Society's branches to discuss the various reports and send the discussion to the Secretary by March 1. Each committee is then to take the discussion on its report into consideration, and ask by July 1 for a letter ballot of the Society's members on the final draft of the report.

CANADA'S GREAT MARKET FOR EQUIPMENT AND SUPPLIES.

From the Toronto News, Feb. 6:

"All the Canadian railways have been recently forced to go abroad with orders because they could not secure the necessary number of locomotives at home within a reasonable time.

"The same remark applies to other lines of equipment, such as passenger and freight cars, and altogether the outlook for companies interested in railway equipment and supplies appears to be particularly good."

Adirondack and St. Lawrence Railroad Locomotive.

The Adirondack and St. Lawrence Rd. has received recently a Mogul locomotive for freight service which exerts a tractive force of 24,800 lbs. The equipment includes automatic and straight air brakes, and M.C.B. couplers front and back. Pilots and headlights are also applied at each end, the pilots being of pressed steel of a new design. The fire-box is placed above the frames and is fitted with a brick arch supported on studs. The frames are of forged iron with double front rails. In all other respects this locomotive is designed and equipped in accordance with the present day practice for engines of this class. Following are the principal dimensions:—

Cylinders	18 x 24 ins.
Valves	Balanced slide
Boiler—Type	Wagon top
" Material	Steel
" Diameter	56 ins.
" Thickness of sheets	5/8 & 11-16 ins.
" Working pressure	180 lbs.
" Fuel	Soft coal
" Staying	Radial
Fire Box—Material	Steel
" Length	74 11-16 ins.
" Width	40 ins.
" Depth, front	61½ ins.
" Depth, back	60 ins.
" Thickness of sheets, sides	5-16 in.
" Thickness of sheets, back	5-16 in.
" Thickness of sheets, crown	3/8 in.
" Thickness of sheets, tube	½ in.
Water Space—Front	4 ins.
" Sides	3½ ins.
" Back	4 ins.
Tubes—Material	Iron
" Thickness	No. 11 W.G.
" Number	206
" Diameter	2 ins.
" Length	11 ft.
Heating Surface—Fire box	111 sq. ft.
" Tubes	1,177 sq. ft.
" Total	1,288 sq. ft.
" Grate area	20.7 sq. ft.
Driving Wheels—Diameter, outside	48 ins.
" Diameter, centre	42 ins.
" Journals, main	8 x 9 ins.
" Journals, others	8 x 9 ins.
Engine Truck Wheels—Diameter, front	26 ins.
" Journals	5 x 8 ins.
Wheel Base—Driving	12 ft. 6 ins.
" Total engine	20 ft. 0 ins.
" Total engine & tender	46 ft. 11½ ins.
Weight—On driving wheels	101,000 lbs.
" On truck, front	17,500 lbs.
" Total engine	118,500 lbs.
" Total engine & tender	210,000 lbs.
Tender—Wheels, number	8
" Wheels, diameter	30 ins.
" Journals	4¼ x 8 ins.
" Tank capacity	4,500 gals.
" Fuel capacity	8 tons

It was built by the Baldwin Locomotive Works, Philadelphia.

The Canadian Transfer Co.'s annual meeting was held at Montreal, Jan. 30. The following were re-elected directors: C. Cassils, Hugh Paton, G. R. Starke, Sir Montagu Allan and H. M. Molson. F. M. McRobie is General Manager and Secretary.

How to Remedy Soft Spots in the Roadbed.

At the Roadmasters and Maintenance of Ways Association's last annual meeting at St. Louis, Mo., the committee on the above subject presented the following report:—

Before suggesting a remedy for the cure of soft spots in a roadbed, we think it would be well to determine the cause of the troublesome places, as we think it would be far more economical to avoid them, in the first place, than later to spend the greater part of the allowance for maintenance trying to keep the track at such places in surface line and gauge, and ultimately go to the expense of tile and cross draining, which is the only effective method after the pockets have reached a depth where it is impossible to drain them by ordinary surface ditches.

Soft spots in roadbed, on fills, are caused usually by objectionable material (usually clay from the bottom of barrow pits, or stumps or other timbers

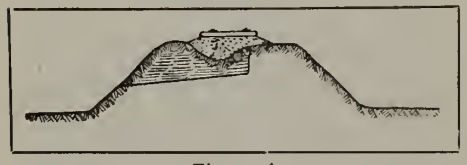

Figure 1.

which are placed in the dumps by the contractors in order to complete the job as quickly and cheaply as possible). Decomposing timber and the gumbo clay of which the sub-grade is constructed fail to support the track under heavy traffic and the weak places are shortly replenished with ballast of some kind and a typical soft spot is formed. Where these spots are caused by stumps or timbers placed in the dump they should be removed or one may expect to have trouble until they have rotted entirely away.

When the sub-grade is constructed of clay of various kinds, the worst material perhaps is what is familiarly known as gumbo. Where rainfall is great, this clay gives little chance for water to run off, and it generally stands in pockets in the dump and changes from one side of the track to the other, causing the clay to heave upward and bulge out on sub-grade at base of ballast. To overcome this a trench should be dug as shown in fig. 1, beginning at the opposite side of the track and digging through the bulge to the base of the dump. This trench should be dug a foot or 18 ins. below the bottom of the pocket and as far apart as the formation of the sub-grade requires them. They should be 18 ins. wide to allow free working of men. Fill in the bottom with coarse engine cinders to a height of 15 ins., the balance of trench with ordinary cinders, using care to keep the outlet free at all times.

In cuts, soft spots are formed by pockets of plastic clay or depression in the sub-grade which, on account of insufficient drainage, become thoroughly saturated during wet weather. This forms poor support for the ballast and allows the track to settle and forces the ballast below the subgrade. Ballast of some kind is ordered and in the meantime mud shims, or often crossing plank or ties are placed under the track ties to maintain the surface temporarily. Very often the timber is left there when the ballast is finally received and applied. The renewal of the ballast is repeated at intervals until it is from 18 ins. to 5 ft. deep. The clay that has been displaced by the ballast is forced outward and upward just outside the ballast line which intercepts the passage of water from the pocket to the open ditch, making it a difficult matter to drain it properly.

Many methods have been tried, with varying success, to remedy these soft spots, and we will take them in order. as their location and the amount of money available, must determine, very often, the method to be employed. Before considering the more expensive methods we will take up the question of surface drainage.

Where the conditions require it, a surface ditch should be constructed and maintained on the top of the cut, to care for the water running toward the cut from adjoining fields, and an open ditch on each side of the track in cuts should be constructed only deep enough to carry the water it is expected to take care of. Open ditches should be kept clean and free from obstructions, so that no water will stand in them. Where standing water cannot be taken care of the ditches should be tile drained.

Where good surface drainage has failed, on account of the bottom of the pocket at a soft place becoming lower than the bottom of the adjoining ditch. making it impossible to drain it, the ballast may be removed, together with

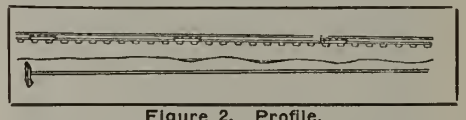

Figure 2. Profile.

the clay shoulder which has heaved at either side, and the cavity should be filled with harder material, practically forming a new sub-grade. This will remove the pocket which causes the trouble and will be found very satisfactory.

Where authority for tile draining ditches and roadbed may be had, it will be found to give the best results, however, and it is only a question of the best kind of tile to be used and the best and most economical method to be employed in order to get the best and most lasting results.

COST PER DRAIN

Depth of ditch.	.3	.4	.5	.6	.7
Material, tile.....	.04	.04	.04	.04	.04
" cinder. ..	.04	.05	.06	.07	.09
Labor, maximum.....	.18	.37	.56	.75	1.00
" minimum.....	.10	.15	.21	.27	.35
" average	.13	.20	.26	.33	.42

Fig. 2 shows a method of tile and cross draining the roadbed which has been found satisfactory. Beginning at the outlet, dig a trench 18 ins. wide parallel with the track, so that the tile when laid will be 9 ins. out from the ends of the ties and not less than 18 ins. below the pockets to be drained, being careful not to get less than 12 ins. fall in 1,000 ft. Lay either 4-in. or 6-in. glazed tiling with bell joints the entire length of the cut, carrying the water from the apex both ways, or all one way, as the conditions may require. Before laying the tile, use a round-pointed tool to shape the bottom of the trench, so that the tile will lie in a round surface instead of on flat ground. This will have a tendency to keep the tile in perfect alignment and surface. When the tile is laid, fill the trench with engine cinders. Cross trenches should be dug as the conditions require it and filled with engine cinders as shown in fig. 2. The cost of this work varies greatly, being governed a great deal by local conditions and the kind of labor employed. The figures given in connection with fig. 1, however, were taken from a job recently completed and are authentic.

COST PER FOOT

Depth of drain.....	.3	.4	.5	.6	.7
Yards of material....	2.5	3.4	4.4	5.4	6.6
Material, cinder.....	.55	.76	.98	1.21	1.47
Labor, averages.....	1.10	1.49	1.93	2.50	3.20

Fig. 3 shows a method of tiling and cross-draining which has been found very satisfactory. The depth of the tile drain should be governed entirely by local conditions, but should be below the

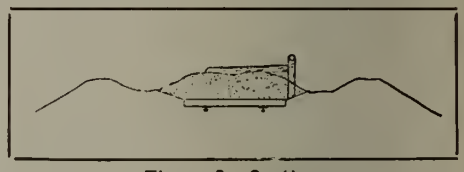

Figure 2. Section.

frost line. The grade line should be determined by a competent engineer, in order to insure satisfactory results and perfect drainage. Use vitrified tile with bell ends not less than 6 ins. in diameter. A line may be laid on one or both sides of the cut, as may be deemed necessary. The trench should be excavated 3 ins. below the grade line and dirt should be trucked out of the cut and placed on the fill for widening the roadbed. Then fill the trench 3 ins. deep with engine cinders well tamped. Then lay tile with the bell ends up stream on cinders in perfect line and surface, after which back fill the trench with cinders. Where pockets have formed in the roadbed, cross drains should be put in. Where a drain is constructed on both sides of the track, cross drains should be put in alternately from the centre of track to the drains on either side, as the local conditions may require it, and should be connected with the tile with a "T." Vitrified tile or short lengths of cast iron pipe is best for cross draining. Care should be used in establishing a grade line so that the tile will be laid deep enough to permit cross drains to be put in at any time below any deformation or pocket in the roadbed.

Fig. 4 shows a plan for draining a cut which is expected to be double-tracked later. A single line of pipe on one side, laid as shown in fig. 3, with cast iron cross drains at intervals to a catch basin on the opposite side to take care of surface water. When second track is laid the ditch should be partly filled with cinders, which will insure good drainage for the second track and an additional line of pipe should be laid outside of the new track.

To get good results, these tile ditches should be cleaned off as often as it is necessary, which is governed by weather conditions and the nature of the cut in which they are placed. Concrete catch basins placed at intervals as conditions

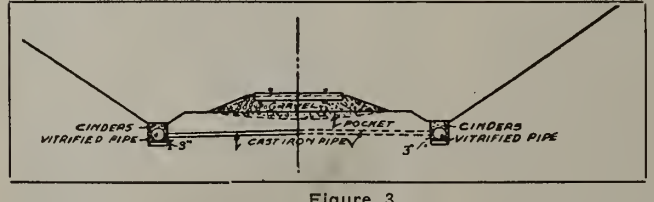

Figure 3.

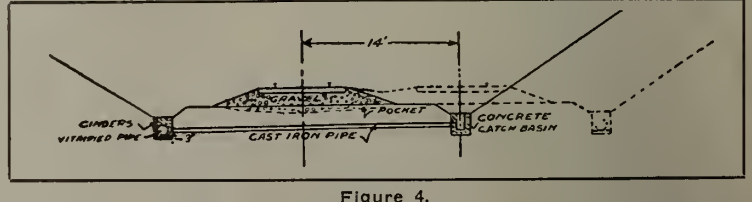

Figure 4.

require, to care for the surface water more quickly, will be found very satisfactory in times of heavy rainfall. There is a great difference of opinion as to the kind of tile which is best for this work. We would say to use the kind of tile best suited for the soil and local conditions which will be encountered at the point to be drained. The cost of construction for labor varies so greatly, being governed by the kind of labor employed and the conditions under which the work is to be done, that figures will be of little value, as it runs from 10 to 30 cents per foot, but at the maximum figure the benefits derived are so great that they warrant the expenditure.

We would recommend that more attention and care be given to roadbed construction when railways are constructed, and that such important matters should not be left to the discretion of contractors.

In the construction illustrated by fig. 1 use engine cinders for back-filling and cap with recovered ballast. The fall of the bottom of the drain should not be less than 12 ins. in 1,000 ft. and should reach at least 18 ins. below working gumbo.

In the construction illustrated by fig. 2 a concrete headwall is recommended with sufficient drop to prevent back filling of the drain. The fall of the drain should not be less than 12 ins. in 1,000 ft. The tile should be laid at least 18 ins. below the heaving gumbo. Use 6-in. tile, and engine cinders for back-filling, with cinder laterals where necessary.

In the construction illustrated in fig. 3 the trench should be excavated 3 ins. below the grade line and filled to that depth with cinders, tamped. The trench should be back-filled with cinders after pipe is laid. All dirt excavated from trench should be removed from the cut and used in widening banks. The vitrified pipe used should not be less than 6 ins. in diameter. Where conditions warrant vitrified pipe may be placed on one side only. Where there are signs of water percolating through the earth under the track, cross drains should be constructed under track extending from centre of track to vitrified pipe. These cross drains should be constructed alternately from one vitrified pipe, and then the other end placed at such intervals as local conditions may warrant. Cross drains under track should be cast iron and not less than 4 ins. in diameter and of short lengths. Where cross drains are used they should be connected with vitrified pipe by the use of a "T" connection. The ends of cross drains under track should be covered with broken stone to keep out the dirt. The vitrified pipe, where possible, should be laid deep enough so that cross drains, when used, can be placed below any pocket or deformation in roadbed.

In the construction illustrated in fig. 4 the trench should be excavated 3 ins. below the grade line and filled to that depth with cinders and well tamped. The trench should be back filled with cinders after the pipe is laid. All dirt excavated from trench should be removed from cut and used in widening banks. The vitrified pipe used should not be less than 6 ins. in diameter. The pipe used for cross drains should be less than 4 ins. in diameter and should be of short lengths. Cross drains should be connected with vitrified pipe by the use of a "T" connection. Cross drains and catch basins should be constructed at such intervals as local conditions may require, but generally never nearer than 400 feet apart. Catch basins should be provided with a grated cover. Water on the catch basin side of the track should be drained into catch basins through open ditches. When second track is constructed catch basins should be covered with broken stone and additional pipe constructed in the ditch outside of second track.

Steam Railway Statistics for Canada for 1910-1911.

The statistics for the year ended June 30, 1911, show that the total mileage of main track was 25,400, an increase of 669 miles over June 30, 1910. In addition there were 7,159 miles of second and other tracks, making altogether 32,559 miles in operation. Over 7,000 miles of line were reported to be under construction, of which 1,578 were in actual operation, although not on June 30, declared to be so by the Board of Railway Commissioners. The railway mileage in the several provinces in operation, as compared with June 30, 1910, was as follows:—

	Miles.	Miles.
Ontario	8,322	8,230
Quebec	3,882	3,795
Manitoba	3,466	3,221
Saskatchewan	3,121	2,932
British Columbia	1,842	1,832
New Brunswick	1,548	1,522
Alberta	1,494	1,488
Nova Scotia	1,354	1,351
Prince Edward Island	269	269
Yukon Territory	102	91
Total	25,400	24,731

The total capital liability was $1,528,689,201, of which $749,207,687 represented capital stock, and $779,481,514 funded debt. This is an increase of $61,650,300 in stocks, and $56,741,214 of funded debt, a total of $118,391,514 for the year. After making deductions for duplication of stocks and bonds owing to amalgamations, etc., and the situation with respect to Government lines, the capital liability is shown to be $55,829 a mile. The total amount paid in dividends on the capital stock was $30,577,740, or at the rate of 4.08%, against an average of 3.16% paid on the $687,557,387 of capital stock for 1909-10. The net earnings—the difference between operating income and operating expenses, was $57,698,709 against $53,550,777 or 7.70% on the capital stock, against 7.78% on the capital stock in 1909-10.

The cash aid given during the year totalled $1,426,192, of which $1,284,892 was paid by the Dominion Government, $82,000 by the provinces, and $59,000 by municipalities. These figures bring the amount paid in aid of railway construction by the Dominion Government to $148,217,072; by the Provincial Governments to $35,919,360, and by municipalities to $18,042,823, making a total of $202,179,255. In addition land grants by the Dominion and Provincial Governments have aggregated 55,256,429 acres, and outstanding guarantees on June 30, 1911, reached $148,336,357.

The earnings from all sources aggregated $188,733,494, an increase of $14,777,277 in the year, the sources of revenue being as follows:—

	1910-11.	1909-10.
Passengers	$ 50,566,893.98	$ 46,018,879.56
Mails	1,869,413.89	1,799,887.80
Express	4,674,135.27	4,143,837.52
Baggage, parlor cars, etc.	1,207,555.31	993,613.63
Freight	126,570,533.52	117,497,604.03
Station and train privileges	826,251.92	679,061.12
Telegraphs, rents, etc.	3,018,709.92	2,823,333.47
	$188,733,493.81	$173,956,217.13

The operating expenses increased $10,629,344.53, the comparative distribution being:—

	1910-11.	1909-10.
Way and structures.	$ 29,245,093.22	$ 27,035,603.46
Equipment	26,127,638.12	26,002,301.30
Traffic expenses	4,831,744.50	4,366,176.92
Transportation	66,343,269.58	58,928,170.74
General expenses	4,487,039.53	4,073,188.00
	$131,034,784.95	$120,405,440.42

The railways carried 37,097,718 passengers and 79,884,282 tons of freight, an increase of 1,203,143 passengers and 5,401,416 tons of freight over 1909-10. The following tables give general statistics regarding traffic:—

PASSENGER TRAFFIC.	1910-11.	1909-10.
Number of passengers	37,097,718	35,894,575
Passengers carried one mile	2,605,968,924	2,466,729,664
Passengers one mile per mile of line	102,597	99,742
Passengers per mile of line	1,460	1,451
Average passenger journey (miles)	70	69
Average number of passengers per train	60	59
Passenger train mileage	36,985,911	35,022,541
Mixed train mileage	6,277,468	6,441,440
Earnings from ticket sales	$50,566,894	$46,018,880
Earnings from passenger service	$58,317,998	$52,956,219
Average receipts per passenger	$1.360	$1.282
Average receipts per passenger per mile (cents)	1.944	1.866
FREIGHT TRAFFIC.	1910-11.	1909-10.
Tons hauled	79,884,282	74,482,866
Tons hauled one mile	16,048,478,295	15,712,127,701
Tons hauled one mile per mile of line	631,829	635,321
Average haul, miles	200	211
Freight train mileage	52,498,866	50,184,108
Mixed train mileage	6,277,468	6,441,440
Revenue from freight	$124,743,015	$116,229,894
Average tons per train	305	311
Average cars per train	18.03	18.15
Average tons per car	16.91	17.13
Average receipts per ton per mile (cents)	.777	.739

The freight business was distributed among the following classes:

Products of agriculture	13,809,536	12,891,351
Products of animals	3,190,702	2,765,006
Products of mines	28,652,236	26,152,022
Products of forest	13,238,347	13,068,940
Manufactures	13,573,987	10,014,279
Merchandise	2,438,089	2,518,190
Miscellaneous	4,981,385	7,073,078
Totals ..... Tons	79,884,282	74,482,866

Further details of earnings and operating expenses are as follows:

Gross earnings	$188,733,494	$173,956,217
Net earnings	57,698,709	53,550,776
Gross earnings per mile	7,430.45	7,033.93
Net earnings per mile	2,271.60	2,165.83
Earnings per passenger	1.363	1.282
Earnings per ton	1.561	1.560
Earnings per passenger train mile	1.348	1.277
Earnings per freight train mile	2.376	2.316
Earnings per train mile, all trains	2.103	2.036
Operating expenses	131,034,785	120,405,440
Operating expenses per mile	5,158.85	4,868.60
Cost of running trains one mile	1.460	1.409
TRAIN MILEAGE.	1910-11.	1909-10.
Passenger trains	36,985,911	35,022,541
Freight trains	46,220,813	43,742,668
Mixed trains	6,277,468	6,441,440
Special trains	232,341	202,592
Total	89,716,533	85,409,241
FREIGHT CAR MILEAGE.	1910-11.	1909-10.
Loaded freight cars	946,946,917	910,858,711
Empty freight cars	311,984,866	280,255,329
Caboose cars	47,834,318	45,367,459
Total	1,306,766,101	1,236,481,499

There were 4,219 locomotives, 4,513 passenger cars, 127,158 freight cars, and 9,578 cars in the service of the several companies, against 4,079 locomotives, 4,320 passenger cars, 119,713 freight cars, and 8,648 cars on June 30, 1910.

The returns of accidents show that 493 persons were killed and 3,329 injured, a decrease of 120 in the number killed, but an increase of 1,190 in the number injured as compared with 1909-10. There were 465 persons killed and 1,906 injured by the movement of trains, distributed as follows:—

	Killed.	Injured.
Passengers	28	288
Employes	202	1,314
Trespassers	185	154
Non-trespassers	48	135
Postal clerks, etc.	2	15

One passenger in every 1,324,919 was killed and one in every 124,489 injured. Accidents at highway crossings resulted in the killing of 36 persons, against 63, and in the injuring of 108 against 155 as compared with 1909-10.

The number of railway employes on June 30, 1911, was 141,224, against 129,768 on June 30, 1910. The aggregate of salaries and wages paid was $74,613,738, an increase of $7,445,945.

Birthdays of Transportation Men in March.

Many happy returns of the day to:—

W. G. Annable, General Passenger Agent, C.P.R. Atlantic Steamship Lines, Montreal, born at Ottawa, Mar. 3, 1875.

P. S. Archibald, M. Can. Soc. C.E., Commissioner New Brunswick Coal and Ry. Co.'s Railway, and General Manager, Elgin and Havelock Ry., Moncton, N.B., born at Truro, N.S., Mar. 21, 1848.

George Bury, Vice President and General Manager, C.P.R. Western Lines, Winnipeg, born at Montreal, Mar. 6, 1866.

Allan Cameron, General Traffic Agent, C.P.R., New York, born near Owen Sound, Ont., Mar. 14, 1864.

F. G. J. Comeau, General Freight Agent, Dominion Atlantic Ry., Halifax, N.S., born at Meteghan River, N.S., Mar. 10, 1859.

A. E. Cox, Storekeeper, Canadian Northern Ry., Winnipeg, born at Huddersfield, Eng., Mar. 12, 1863.

N. Curry, President, Canadian Car and Foundry Co., Ltd., Montreal, born in King's county, N.S., Mar. 26, 1851.

Patrick Dubee, Secretary, Montreal Tramways Co., Montreal, born there, Mar. 4, 1876.

G. R. Fairhead, District Freight Agent, Canadian Northern Ry., Hamilton, Ont., born at Toronto, Mar. 6, 1882.

C. Forrester, Trainmaster, G.T.R., Stratford, Ont., born at Wanstead, Ont., Mar. 5, 1876.

C. O. Foss, District Engineer, National Transcontinental Ry., St. John, N.B., born at Wentworth, N.H., Mar. 20, 1852.

H. M. Gain, Passenger Trainmaster, Eastern Division G.T.R., Montreal, born at Lindsay, Ont., Mar. 21, 1879.

R. A. Gamble, Car Service and Fuel Agent, C.P.R., Moose Jaw, Sask., born at Dublin, Ireland, Mar. 1, 1876.

H. W. Gays, General Manager, Ottawa and New York Ry., Ottawa, Ont., born at Brant, Erie Co., N.Y., Mar. 21, 1848.

J. Halstead, Division Freight Agent, C.P.R., Calgary, Alta., born at Bracebridge, Ont., Mar. 2, 1877.

R. M. Hannaford, M. Can. Soc. C.E., Chief Engineer, Montreal Tramways Co., Montreal, born there, Mar. 22, 1865.

C. A. Hayes, Freight Traffic Manager, G.T.R., Montreal, born at West Springfield, Mass., Mar. 10, 1865.

H. T. Hazen, Chief Engineer, Duluth, Winnipeg and Pacific Ry., and District Engineer of Construction, Canadian Northern Ontario Ry., Port Arthur, Ont., born at Truro, N.S., Mar. 14, 1870.

Joseph Hobson, M. Can. Soc. C.E., Consulting Engineer, G.T.R., Hamilton, Ont., born at Guelph, Ont., Mar., 1834.

N. J. Holden, President, The Holden Co., Ltd., Montreal, born at Nobelton, Ont., Mar. 22, 1866.

A. R. Holtby, Master of Bridges and Buildings, Mountain Division, G.T.P.R., Prince Rupert, B.C., born at Rawdon, Que., Mar. 23, 1859.

Frank Lee, M. Can. Soc. C.E., Division Engineer, C.P.R., Winnipeg, born at Chicago, Ill., Mar. 7, 1873.

R. W. Long, Division Freight Agent, G.T.R., Hamilton, Ont., born at Appin, Ont., Mar. 20, 1873.

T. W. Lowe, General Boiler Inspector, C.P.R. Western Lines, Winnipeg, born at Montreal, Mar. 30, 1858.

J. M. McKay, Trainmaster, C.P.R., Winnipeg, born at Tiverton, Ont., Mar. 13, 1868.

Owen McKay, M. Can. Soc. C.E., Chief Engineer, Essex Terminal Ry., Walkerville, Ont., born in Ross tp., Renfrew co., Ont., Mar. 13. 1848.

Col. H. H. McLean, K.C., M.P., Vice President, St. John Ry., St. John, N.B., born at Fredericton, N.B., Mar. 22, 1855.

Sir Donald D. Mann, Vice President, Mackenzie, Mann & Co., Ltd., and First Vice President, Canadian Northern Ry., Toronto, born at Acton, Ont., Mar. 23, 1853.

D. J. Murphy, Jr., Superintendent of Transportation, Dominion Atlantic Ry., Kentville, N.S., born at Caledonia, Ont., Mar. 3, 1874.

R. Patterson, Master Mechanic, G.T.R., Stratford, Ont., born at Brantford, Ont., Mar. 13, 1860.

F. W. Peters, Assistant to Vice President, C.P.R., Winnipeg, born Mar. 25, 1860.

E. H. Sewell, City Passenger Agent, C.P.R., Sherbrooke, Que., born at Quebec, Mar. 17, 1875.

C. J. Smith, General Manager, Richelieu and Ontario Navigation Co., Montreal, born at Hamilton, Ont., Mar. 10, 1862.

G. Somerville, agent, Merchants Line Steamers, Toronto, born at Kingston, Ont., Mar. 21, 1855.

W. Y. Soper, director, Ottawa Electric Ry. Co., Ottawa, Ont., born at Oldtown, Me., Mar. 9, 1854.

W. C. Starke, Travelling Car Service Agent, G.T.R., Montreal, born there, Mar. 9, 1867.

W. F. Tye, President, Canadian Society of Civil Engineers, ex-Chief Engineer, C.P.R., consulting engineer, Toronto, born at Haysville, Ont., Mar. 5, 1861.

G. W. Vaux, Canadian Passenger Agent, Union Pacific Rd., Toronto, born at Montreal, Mar. 21, 1866.

A. T. Weldon, General Freight and Passenger Agent, Black Diamond Steamship Line, Montreal, born at Dorchester, N.B., Mar. 6, 1876.

D. O. Wood, General Freight Agent for Ontario, Allan Line Steamships, Toronto, born at Kleinburg, Ont., Mar. 16, 1864.

Dominion Government Aid to the Grand Trunk Pacific Railway.

A resolution was passed by the House of Commons Feb. 2 authorizing the payment out of the consolidated revenue fund such sums as may be sufficient to discharge the obligations of the Dominion to the Grand Trunk Pacific Ry. Co. under the provisions of par. 5 of the schedule attached to chap. 54 of the statutes of 1904, in accordance with the interpretation of the paragraph by the judgment of the Imperial Privy Council, Nov. 2, 1911. The Minister of Finance, in moving the resolution, stated that the agreement between the Government and the G.T.P. Ry. was made July 29, 1903, and under it the Government was to guarantee the company's bonds up to $13,000 a mile for the prairie section, and $30,000 a mile for the mountain section, the rate of interest to be 3%; the G.T.R. to guarantee the bonds to the extent of the remaining 25%. A supplementary agreement was made in the following year, under which the guarantee of the bonds in respect of the mountain section was to be 75% of the actual cost, and the guarantee in respect of the bonds of the prairie section 75% of the cost, but not to an amount in excess of $13,000 a mile, and paragraph 5 of the agreement, which was attached as a schedule to the Act of 1904, contained the words: "the Government may and shall . . . implement . . . its guarantee." In 1905 a trust mortgage was executed over the entire line from Winnipeg to Prince Rupert, securing a bond issue of £14,000,000 of bonds to be guaranteed by the Government.

A difference arose between the company and the Government as to the meaning to be placed on the words implementing the guarantee. The Government contended that the words mean that the G.T.P. Ry. would issue its bonds to an amount which would realize $13,000 a mile on the prairie section, and pay for the amount of bonds required to pay 75% on the cost of the mountain section. The company contended that the Dominion should implement or make up the difference between the net selling price of the bonds, and par, and that there was no obligation on it to issue its bonds further than to the amount of $13,000 a mile for the prairie section or of 75% of the cost of the mountain section, no matter what they realized. The case went to the courts and the judgment of the Privy Council sustained the company and reversed the decision of the Supreme Court. A memorandum had been prepared showing the liability of the Dominion to the company under this judgment. In 1905 there were sold £3,200,000 of bonds at 92½; in 1909, there were sold £2,000,000 of bonds at 80, and in 1910, a further £2,000,000 of bonds at £80 3s. 9d. In respect of these bonds the Dominion has to pay under the judgment $4,900,000. On the basis of the estimated cost of the construction of the mountain section as made by the consulting engineer for the Government, there are yet unsold £5,515,220 of these bonds to make up the 75 per cent. upon which there is the Government guarantee, and upon which the Government will be called upon to make up in cash whatever difference there may be between the total amount issued and the amount realized for them.

A bill giving effect to this resolution was subsequently introduced in the House of Commons.

The Making of a Great Canadian Railway is the title of a volume of 350 pages by F. A. Talbot, published by Seeley, Service and Co., London, Eng., and by the Musson Book Co., Toronto. The great Canadian railway referred to is the National Transcontinental, which is being built by the Dominion Government between Moncton, N.B., and Winnipeg, and by the Grand Trunk Pacific Ry. between Winnipeg and the Pacific coast, and which will be operated by the G.T.P.R. In the opening chapter, which deals with the birth of the project, reference is made to the coming to Canada as General Manager of the G.T.R. of C. M. Hays, who is now President, both of the G.T.R. and the G.T.P.R., and by a most unaccountable error it is stated Mr. Hays "first set foot in Canada in 1899," and again "His mission to Canada in 1899 was somewhat curious." As a fact, Mr. Hays was appointed General Manager of the G.T.R. in 1896, following the reconstruction of the company under the presidency of Sir C. Rivers Wilson. The various chapters deal with the making of surveys, and the work of construction from end to end of the line, and are filled with stories of adventure by mountain, field and flood, of difficulties faced and conquered, and of the wonderful development that has sprung up in the country as section after section of the line was built and opened for traffic. The romance rather than the science of the work is dealt with and a very interesting and readable book has been written. Mr. Talbot spent the greater part of 1910 in going over the route gathering the materials for the book, which is embellished by 43 illustrations made from photographs. The price of the volume is $2.50.

The Dominion Transfer Co. has been incorporated under the Manitoba Companies Act to transport by land or water or through the air by means of vehicles, cars, ships or other methods, and whether propelled by horse, gas, steam, electricity or other power, passengers, goods, wares and merchandise of all sorts and descriptions, both within and without the province of Manitoba, and to charge and collect therefor, and other incidental business. The capital is fixed at $50,000; the office is at Winnipeg, and the following are provisional directors:—A. T. Bowes, J. A. Dack, C. Dowling, Winnipeg, and Jos. Wood, Brandon.

The Mond Nickel Company's Railway.

The Mond Nickel Co., which has for some years been located at Victoria Mines, Ont., on the C.P.R. Sault Ste. Marie branch, where it operates a smelter plant, is building a large and more extensive smelter, with all the accessories, about eight miles east of Sudbury, where the company has secured a tract of land most advantageously situated, lying in the triangle bounded by the C.P.R. main line, the C.P.R. Toronto-Montreal line, and the Canadian Northern Ry. The natural physical shape of the property has been most carefully taken advantage of in locating the different portions of the plant, giving great facilities for obtaining and handling the ore from the mines until the products leave for market. The shape of the ground affords a site for smelter, ore bins, rock houses, slag dump, track scales, shops, etc., where the ore can be handled at a minimum of cost.

The company built last year a standard gauge railway laid with 80 lb. rails, connecting the C.P.R. and the Canadian Northern Ry., running cars, its property, with spur lines and switchbacks reaching every part of the plant. The grading and bridging work is on C.P.R. specifications, cuttings 22 ft. wide, embankments 16 ft. Curvature and gradients are as light as can be secured in reaching the various elevations of the different part of the plant, and the lines were located after exhaustive surveys. The roast yards are situated on a level bench adjoining the Canadian Northern Ry., branching off from two parallel sidings on the company's main line, where it leaves the C.N.R. The yard is half a mile long by 350 ft. wide, with six tracks in pairs and three beds.

The property is all timbered, which gives the necessary fuel sufficient to last a long time. At the junction with the C.P.R. the latter company has laid long sidings, and is building a station with loading platform, etc. Water supply for the smelter works is obtained from the Wanapitei River, where the company has installed a pump house and laid a pipe line of about two miles to the works. The electrical power is obtained from the Wanapitei Light and Power Co., whose plant is situated a short distance from the junction of the Mond Nickel Co.'s main line with the C.P.R.

During the past summer all the railway sidings, amounting to about 10 miles, were completed by Angus Sinclair, C.E., contractor, and at present the smelter building of concrete is being built, the work being carried on successfully during the winter months by the use of hot water for cement.

The whole work is under the charge of C. V. Corless, Manager of the Victoria Mine, and J. F. Robertson, Chief Engineer for the company, and it is expected the new plant will be in operation towards the end of this year.

A Mallet Locomotive of large size recently built for the Pennsylvania Rd. by the American Locomotive Co., has the special feature of being a simple instead of a compound engine. It has 16 driving wheels of 56 ins. diameter, which are arranged in two groups, with a pair of 27 x 28-in. cylinders to each group. The weight of engine and tender is about 335 tons, which is 136 tons heavier than the largest freight engines now in service on this road. The total heating surface is 7723 sq. ft., and the steam pressure is only 160 lb. The total length over engine and tender is 98 ft. 4 in. The locomotive has been built largely as an experiment, and will be tried in freight service on the steep grades of the line in western Pennsylvania.

Uniform Specifications for Railway Roadbed and Ballasting.

At the Canadian Society of Civil Engineers' annual meeting in Montreal recently a report was submitted from the committee on roadbed and ballasting, of which J. G. Sullivan, Chief Engineer, Western Lines, C.P.R., is chairman, recommending for consideration specifications under the following headings:— General, clearing, grubbing, grading, excavations and embankments, borrow pits, side ditches, etc., classification, price and measurement of grading, alternate optional overhaul clause, foundations, tunnel excavations, timber structures, piling, sheet piling, frame trestles, log and timber culverts, concrete culverts and culvert pipes, riprapping, paving, revision of existing line or widening for additional track, track, general provisions and conditions.

W. B. Mackenzie, Chief Engineer, Intercolonial Ry., said he heard nothing of the proposed specifications until about a month before the meeting. He spent a couple of days going over it and sent a memo of his views on certain portions to the chairman of the committee, but the report had been presented as originally prepared, without any change. He expressed himself in favor of the Association adopting standard specifications and proceeded to discuss the specifications as submitted in detail, pointing out numerous paragraphs which he thought should be revised.

After considerable discussion by other members, including G. A. Mountain, Chief Engineer, Board of Railway Commissioners; S. B. Clement, Chief Engineer, Temiskaming and Northern Ontario Ry.; G. H. Duggan, Chief Engineer. Dominion Bridge Co., and others, and the proposal of a motion and several amendments it was decided to refer the report to the society's various branches for discussion and report, that members who cannot attend the meetings be asked to send in their opinions or suggestions by March 1; that the committee consider the same and ask for a letter ballot of the members on the final report by June 1.

Telephone Train Dispatching on the Canadian Pacific Railway.

In our January issue we gave complete details of the C.P.R. telephone train dispatching circuits, showing a total of 3,932 miles so equipped, with 516 stations. We are officially advised that appropriations have been made for the equipment of the following additional circuits:—

	Miles.
Kamloops to North Bend, B.C.	121
North Bend to Vancouver, B.C.	129
Medicine Hat to Lethbridge, Alta.	116
Moose Jaw to North Portal, Sask.	167
Guelph Jct., Goderich and Listowel Branch, Ont.	112
Grand Mere and St. Gabriel branch, Que.	56
Total	701

The following equipment will be used on the different sections:—

Between Vancouver and Kamloops, selector and Kellogg telephone equipment.

Medicine Hat to Lethbridge, Gill selector and Northern Electric & Mfg. Co.'s telephone equipment.

Moose Jaw to North Portal, Sandwich selector and Kellogg telephone equipment.

Goderich and Listowell branches, Gill selector and Northern Electric and Mfg. Co.'s telephone equipment.

Grand Mere and St. Gabriel branches. Gill selector and Northern Electric and Mfg. Co.'s telephone equipment.

Railways and Canals Department's Expenditures, Etc.

The total expenditure of the Railways and Canals Department for the year ended Dec. 31, 1911, was $40,180,326.81, of which $2,369.52 was expenditure common to both branches. The total income was $10,470,532.87. The total expenditure on railways and canals prior to and since Confederation is $606,502,600.32, of which $812,727.84 is on general account common to both branches. The total revenues collected are $171,784,079.86.

The total railway expenditure for the year was $36,301,979.24, of which $24,760,029.58 was charged to capital, $1,503,070.89 to income, and $10,038,878.77 to revenue. The expenditure on capital account included $23,488,208.40 for the eastern division of the National Transcontinental Ry.; $184,149.81 for the railway to Hudson Bay, and $227,563.40 for the Quebec Bridge. The income account included $1,284,892.04 paid as subsidies to railways; $164,392.32 for the Board of Railway Commissioners, and $21,619.34 for inspection of the Grand Trunk Pacific Ry.

The expenditure on the Intercolonial Ry. included the working expenses of $9,595,976.79 charged to revenue account, and $762,869.06 charged to capital account; while $17,797.98 was charged to revenue account for the maintenance of the Windsor branch. Of the expenditure on the Prince Edward Island Ry., $424,104 was charged to revenue account and $94,320.56 to capital account.

The total expenditure prior to and since Confederation amounts to $261,414,694.87 on capital account; $214,073,844.19 covering the operation of the Government lines; $42,735,008.32 subsidies to railways other than the C.P.R. main line, making a total of $475,489,401.56. The expenditure prior to Confederation amounted to $13,881,460.65 on portions of what is now the Intercolonial Ry. and the Prince Edward Island Ry.

The total expenditure on canals for the year was $3,875,978.05, of which $2,349,474.49 was charged to capital account; $440,269.03 to income account; $595,894.79 for staff and $490,339.74 for repairs, these two amounts being charged to revenue account. Since June 22, 1905, when the tolls for the passage of vessels and goods along the canals were abolished, the revenues for the canal branch have arisen from hydraulic rents and miscellaneous sources. The amount received during the year was $221,138.49, of which $187,908.53 accrued from hydraulic rents. The total expenditure on canals prior to and since Confederation amounts to $99,331,923.86 on capital account, and $30,868,547.06 from the consolidated funds for operation, maintenance and repairs. The expenditure prior to Confederation was $20,593,866.13. The total revenue collected amounts to $14,377,492.63.

Canadian Northern Ry. Tie Preservation.—A press report recently stated that at the plant which is being established at Fort Frances, Ont., for treating Canadian Northern Ry. ties, poplar ties were to be treated instead of those of other woods usually used. We are officially advised that this is incorrect, as ties made from all woods in the vicinity of the Rainy River will be treated, including pitch pine, red pine or Norway, and tamarack, also probably some spruce.

Toronto Mail and Empire—"Fifty millions for railway extensions in the Canadian West this year! That is equivalent to $25 for every inhabitant. It is not surprising that the West experiences a few growing pains."

Orders by the Board of Railway Commissioners.

Beginning with June, 1904, we have published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed our paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates given of orders, immediately following the numbers, are those on which the hearing took place, and not those on which the orders were issued. In many cases orders are not issued for a considerable time after the dates assigned to them.

15815. Jan. 19.—Extending to Mar. 1 time for execution of commissions and for report to the Board in connection with examination of witnesses in Dawson Board of Trade vs. White Pass and Yukon Route, as provided by order 15719, Jan. 2.

15816. Jan. 17.—Authorizing G.T.P. Branch Lines Co. to build spur from its Mountain Park coal branch for Yellowhead Pass Coal and Coke Co., Alberta.

15817. Jan. 18.—Approving C.N.O.R. location through Springer, Field, Badgerow, Gibbons and Crerar tps., Nipissing district, mileage 366 to 386 from Montreal.

15818. Jan. 18.—Authorizing town of Leamington, Ont., to carry street over M.C.R. right of way.

15819. Jan. 18.—General order re less than carload freight to be carried in heated cars. This order is given in full on another page.

15820. Jan. 20.—Amending order 15741, Jan. 3, by providing that C.P.R. install cover plates where tracks pass through the sidewalk, in connection with spur for Swift Canadian Co., Winnipeg.

15821. Jan. 19.—Approving Maine Central Rd. bylaw authorizing W. K. Sanderson, G.F.A., H. D. Waldron, G.P.A., and F. S. Davis, Chief of Tariff Bureau, to issue tariffs.

15822. Jan. 18.—Authorizing International Bridge and Terminal Co. to build its bridge and railway across Church St., Fort Frances, Ont., crossing to be protected by gates.

15823. Jan. 19.—Authorizing C.P.R. to build its Lacombe Easterly branch of Calgary and Edmonton Ry. across 10 highways, divert same, and close up portions of diversions, mileage 129.47 to 139.22, Alta.

15824. Jan. 20.—Authorizing Vancouver, Victoria and Eastern Ry. (G.N.R.) to build portion of tram track on Front St., Vancouver, B.C.

15825. Jan. 19.—Approving location of G.T.P.R. station at Fitzhugh, Alta.

15826. Jan. 22.—Approving location of C.N.O.R. station grounds at Portland, Ont.

15827. Jan. 20.—Authorizing C.N.O.R. to cross public road on lot 8, between cons. 2 and 3, Dorion tp., Thunder Bay District.

15828. Jan. 23.—Authorizing Brooke tp., Ont., to build McDougall drain under Canada Southern Ry.

15829. Jan. 23.—Approving location of C.N.O.R. station grounds at Dwyer Hill.

15830. Jan. 24.—Extending to Feb. 15, time for erection of gates by G.T.R. at John St., Toronto.

15831. Jan. 24.—Extending to June 30 time for building subway at Elizabeth St., West Toronto, Ont.

15832. Jan. 24.—Authorizing city of Strathcona, Alta., to build level crossing over Calgary and Edmonton Ry. (C.P.R.) at Third Ave North.

15833. Jan. 24.—Authorizing C.P.R. to divert highway between secs. 9 and 4, Naples station, mileage 85.3, Napinka subdivision.

15834 to 15836. Jan. 24.—Dismissing applications of city of Strathcona, Alta., for level crossings over Calgary and Edmonton Ry. (C.P.R.) at three points.

15837. Jan. 25.—Approving C.P.R. proposed addition to bridge and change of grade across Mountain St., Montreal.

15838. Jan. 24.—Authorizing G.T.R. to rebuild swing bridge over Rideau canal at Ottawa.

15839. Jan. 24.—Relieving G.T.R. from further protection at Adelaide St., Mount Bridges, Ont.

15840. Jan. 24.—Authorizing British Columbia Government to build highway crossing over C.P.R. one mile north of Okanagan Landing.

15841, 15842. Jan. 23.—Authorizing C.N.O.R. to cross public road in lot 8, between cons. 1 and G, Medora tp., Muskoka District, and to cross Jane St., York tp., and build bridge to carry highway over track.

15843. Jan. 23.—Extending to Apr. 9, time for installation of bell by C.P.R. near St. Basile, Que.

15844. Jan. 27.—Disallowing G.T.R. and C.P.R. tariffs on rope, etc., until further order.

15845. Jan. 26.—Authorizing C.P.R. to build its Pheasant Hills branch across 31 highways, mileage 202.00 to 252.92, Man.

15846. Jan. 27.—Adding Halton county as party to application of Nelson tp. for protection of G.T.R. Plains Road crossing west of Burlington Jct., Ont.

15847. Jan. 25.—Authorizing G.T.R. to rebuild bridge 236 over Chateauguay River, mileage 43.82, at Brysons, Que.

15848. Jan. 25.—Amending order 15498, Nov. 28, 1911, re C.P.R. spur to ballast pit at Elson, Alta.

15849, 15850. Jan. 25.—Authorizing C.P.R. to build spurs for Redcliffe Realty Co., Redcliffe Brick and Coal Co., and Quinlan Carter Co. in Alberta.

15851. Jan. 25.—Ordering C.N.R. within six weeks to provide farm undercrossing for A. J. Hunter, Sleeman, Ont.

15852. Jan. 25.—Approving plans of Morden drain to be built under M.C.R. in Aldborough tp., Ont.

15853. Jan. 31.—Amending order 15802, Jan. 11, re Canadian Copper Co.'s spur.

15854. Jan. 31.—Naming express collection and delivery limits for Magog, Que.

15855. Feb. 8.—Extending for three weeks time for filing plans for C.P.R. interlocker at Woodstock, Ont., as required by order 15451, Nov. 7, 1911.

15856. Jan. 31.—Authorizing Smart Turner Machine Co. to erect travelling crane across G.T.R. siding at Hamilton, Ont.

15857. Jan. 31.—Ordering that cost of gates at M.C.R. crossing east of Welland station, Ont., as provided by order 10568, Feb. 26, 1910, be borne, 15% by town of Welland, 10% by Crowland tp., and remainder by M.C.R.

15858. Feb. 1.—Disallowing Supplement 1 to Boston and Maine Rd. joint and proportional class rate and commodity tariff C.R.C. 1219.

15859. Feb. 1.—Authorizing T.H. and B.R. to build siding for Armstrong Supply Co., Hamilton, Ont., and rescinding order 15745, Jan. 23.

15860. Jan. 31.—Approving revised location of G.T.P. Branch Lines Co. Cutknife Branch, mileage 31.80 to 50.84, Sask.

15861. Jan. 31.—Ordering that town of Simcoe, Ont., pay G.T.R. 15% of cost of protection of crossing at Norfolk St., required by order 15387, Nov. 15, 1911.

15862. Feb. 1.—Authorizing G.T.R. to build siding for Watrous Engine Works, Brantford, Ont., and rescinding order 15255, Oct. 11, 1911..

15863. Feb. 2.—Authorizing G.T.R. to rebuild swing bridge over Richelieu River, mileage 8.75, District 13, Que.

15864, 15865. Feb. 1.—Authorizing C.P.R. to open for traffic its Moose Jaw Southwesterly branch from near Moose Jaw, to mileage 27.4, and its Swift Current Southeasterly branch from near Swift Current to Neville, Sask., mileage 27.4, speed of trains limited to 15 miles an hour.

15866. Feb. 1.—Authorizing T.H. and B.R. to cross at grade Newport St., Brantford, Ont.

15867 to 15869. Jan. 29, Feb. 1.—Approving C.N.R. location through tps. 10-11, r. 3-4, mileage 69.78 to 77.27; through tp. 11, r. 26-30, w. 3 m., Sask., mileage 25.38 to 51.05; and through tps. 5-6, r. 26-28, w. 4 m., Alta., mileage 120.27 to 141.09.

15870. Feb. 1.—Approving location of C.N.O.R. station grounds at Richmond.

15871, 15872. Jan. 27, 29. — Authorizing C.N.R. to cross 13 highways with its Calgary southerly line, Alta., and 10 highways on its Swift Current line, Sask.

15873. Jan. 30.—Authorizing C.P.R. and Montreal St. Ry. to use crossing at Papineau Ave., Montreal, without coming to stop, interlocker being completed.

15874, 15875. Jan. 27, 31.—Authorizing C.P.R. to build spurs for McGillivray Creek Coal and Coke Co., near Coleman, Alta., and for Nicola Valley Pine Lumber Co., near Canford, B.C.

15876. Jan. 30.—Authorizing C.N.R. to open for traffic its Rossburn extension from Hamton to the main line east of Canora, 15 miles, Sask.

15877. Feb. 1.—Approving location of C.N.O.R. station grounds at Newburgh.

15878, 15879. Jan. 27.—Approving C.N.R. location through tps. 9-6, r. 25, mileage 106.37 to 120.27, and tp. 52, r. 24, w. 4 m., mileage 44.40 to 45.97, Alta.

15880, 15881. Jan. 31, 29.—Authorizing C.N.R. to cross with its Grosse Isle branch 15 highways and 9 highways in Woodlands and Rockwood rural municipalities, Man., respectively.

15882. Jan. 26.—Authorizing C.N. Pacific Ry. to use C.P.R. Mission branch crossing for construction purposes only until June 30, under condition that all trains be brought to a stop, subject to terms of order 14577.

15883. Jan. 27.—Approving location of C.P.R. standard portable station on Yahk branch, 5 miles north of Kingsgate, B.C.

15884. Jan. 27.—Authorizing Georgian Bay and Seaboard Ry. (C.P.R.) to build farm crossing, mileage 25, lot 3, con. 6, South Orillia tp., Ont.

15885. Feb. 1.—Relieving C.P.R. from further protection at crossing in Blind River, Ont.

15886, 15887. Feb. 1.—Approving change in location of C.P.R. stations at Ste. Rose and St. Martin Jct., Que.

15888. Feb. 2.—Authorizing C.P.R. to build spur for Construction and Paving Co., North Toronto, Ont.

15889, 15890. Jan. 30.—Authorizing C.P.R. to use bridge over Scugog River, near Lindsay, and to use 10 bridges between mileage 20.64 and 81.13, all on Georgian Bay and Seaboard Ry., Ont.

15891. Jan. 30.—Authorizing C.P.R. to operate trains under bridge 4.37, Walkerton subdivision, Ont.

15892. Jan. 27.—Authorizing C.P.R. and G.T.P.R. to use crossing in s.w. ¼ sec. 33, tp. 34, r. 27, w. 2 m., Sask., interlocker being completed.

15893. Jan. 27.—Certifying correction to G.T.P. Branch Lines Co.'s location plan of its Tofield-Calgary branch.

15894. Jan. 29.—Authorizing G.T.P. Branch Lines Co. and C.N.R. to use interlocking plant at crossing in n.e. ¼ sec. 20, tp. 38, r. 26, w. 2 m., at Dana, Sask.

15895. Jan. 29.—Ordering Pere Marquette Rd. to erect fences in middle part of lot 14, con. 2, Colchester South, Ont.

15896. Jan. 31.—Authorizing Gloucester tp., Ont., to continue Queen Mary St. over C.P.R.

15897. Feb. 2.—Authorizing C.P.R. to open for traffic its second track from Romford Jct. to Crete, Ont.

15898. Feb. 3.—Approving Lake Erie and Northern Ry. location from Grand River, Brantford, to Port Dover, Ont.

15899, 15900. Feb. 1.—Approving standard clearance of G.T.P.R. coal chutes, also for ice house on side tracks.

15901. Jan. 1.—Relieving C.N.R. from further protection of crossing between mileposts 475 and 476, east of Aberdeen, Sask.

15902. Jan. 30.—Amending order 15692, Dec. 27, 1911, by providing that bell at C.P.R. crossing, 1¼ miles east of Ivanhoe station, Ont., be installed before June 29.

15903. Feb. 5.—Extending to Mar. 15 time for installation by G.T.R. of interlocking plant at C.P.R. crossing, Nipissing Jct., Ont., to connection with T. and N.O.R.

15904. Feb. 6.—Approving C.N.O.R. revised location through Loughborough tp., mileage 164.59 to 164.76.

15905, 15906. Jan. 27.—Authorizing C.N.R. to cross two public roads on its Grosse Isle branch, Rockwood rural municipality, Man.

15907. Feb. 5.—Authorizing C.N.R. to cross with its Strathcona-Camrose branch, seven highways in Alberta.

15908. Feb. 6.—Further extending to June 30 time for Hull Electric Co. to complete equipment of cars with power brakes, as required by order 10462, May 3, 1910.

15909. Feb. 6.—Authorizing C.N.R. to build spur on its Vegreville-Calgary line for Rose Deer Coal Mining Co.

15910. Feb. 7.—Amending order 15709, Dec. 29, 1911, by authorizing C.P.R. to build three spurs, instead of two, for Imperial Oil Co., Winnipeg.

15911. Feb. 5.—Authorizing C.P.R. to build across and divert highway at mileage 210.03 at west boundary of sec. 18, tp. 18, r. 16, w. 3 m., Sask.

15912. Feb. 7.—Authorizing C.P.R. to build spur for Saskatchewan Flour Mills Co., Moose Jaw.

15913. Feb. 6.—Amending order 15816, Jan. 17, re G.T.P.R. spur for Yellowhead Pass Coal and Coke Co.

15914. Feb. 6.—Authorizing V.V.E.R. and N. Co. and Vancouver, Fraser Valley and Southern Ry. to use crossing near Ardley, B.C., interlocker being completed.

15915. Feb. 5.—Dismissing application of city of St. Thomas, Ont., to continue Inkerman St. across G.T.R.

15916. Feb. 5.—Removing speed limitation on G.T.P.R. Yorkton branch from Melville to Canora, Sask.

15917. Feb. 8.—Extending to June 1, time for installation of interlocking plant by C.N.R. at C.P.R. crossing near Forward, Sask.

15918. Feb. 8.—Approving location of C.N.R. station at Clyde, Alta.

15919. Feb. 8.—Authorizing C.P.R. to divert streams by 8 ft. concrete culvert at mileage 110.1, Cascade subdivision, B.C.

15920, 15921. Feb. 8.—Authorizing G.T.R. to rebuild bridges over Mud River at milepost 4.87, Rockland branch and, and at milepost 8.06, Hawkesbury branch, Ont.

15922. Feb. 8.—Relieving C.P.R. from erecting fences, gates and cattle guards, on Laggan subdivision, B.C.

15923. Feb. 6.—Authorizing village of Luseland, Sask., to build highway across C.P.R. at mileage 15.95.

15924. Feb. 10.—Authorizing C.P.R. to use five bridges on its Havelock and Toronto subdivision, Ont.

15925. Feb. 10.—Authorizing Lake Erie and Detroit River Ry. (P.M.R.) to remove derails and signals from connection with C.P.R.; and re-arrange interlocking in tower so that towerman can give freight trains a through route to and from the C.P.R. Windsor yard, Ont.

15926. Feb. 5.—Approving Lake Erie and Northern Ry. overhead crossing of T.H. & B. R. and M.C.R. at Waterford, Ont.

15927. Feb. 6.—Authorizing Lachine, Jacques Cartier and Maisonneuve Ry. (G.T.R.) to cross C.P.R. in Montreal, at entrance to Angus shops and near Nolan St., and to take C.P.R. lands. C.P.R. to re-arrange its spurs into Angus shops, compensation to be fixed by agreement.

15928. Feb. 12.—Rescinding order 15254, Oct. 11, 1911, re G.T.R. spur near Jex St., Brantford, Ont.

15929. Feb. 12.—Authorizing C.P.R. to cross with its Pheasant Hills branch, 25 highways, mileage 296.11 to 317.15, Sask.

15930. Feb. 10.—Authorizing C.N.R. to cross with its Calgary Southerly line, 20 highways in Alberta.

15931. Feb. 13.—Approving Kettle Valley Ry. location from mileage 28 to 52 from Hope, B.C.

15932. Feb. 12.—Authorizing C.P.R. to open for traffic portion of railway near Steel siding, mileage 92 to 95, Thunder Bay District, Ont.

15933. Feb. 13.—Approving location of Algoma Central and Hudson Bay Ry. station at Tagona, Ont.

15934, 15935. Feb. 12.—Authorizing C.P.R. to build spurs for Canadian Lumber Yards, Winnipeg, Man., and Crow's Nest Pass Lumber Co., near Wardner, B.C.

15936. Feb. 12.—Authorizing C.N.O.R. to cross road between cons. 1 and 2, lot 8, South Crosby tp.

15937. Feb. 12.—Dismissing application of Canadian Fraternal Association, for order prohibiting G.T.R., G.T.P.R., C.N.R. and M.C.R. from collecting 25c. from delegates attending conventions for certifying their certificates.

15938. Feb. 6.—Authorizing Lachine, Jacques Cartier and Maisonneuve Ry. (G.T.R.) to cross overhead, Rachael, Hogan, Bercy and Sherbrooke Sts Montreal.

15939. Feb. 12.—Authorizing C.N.O.R. to cross 11 highways in Markham tp., mileage 14.9 to 25.69 northerly from new union station site, Toronto.

15940. Feb. 13.—Authorizing C.N.O.R. to open for freight traffic its line from Belleville to Deseronto, 16½ miles.

15841. Feb. 3.—Authorizing British Columbia Ry. (C.P.R.) to build spur from Waldo branch to Baynes Lake across G.N.R., at mileage 1.4, lot 1899 E.K.D., semaphore protection to be provided.

15942. Feb. 13.—Authorizing N.Y.C. & H.R.R. to rebuild bridge A38 on its Adirondack Division, 0.3 miles north of Athelstan.

15943. Feb. 12.—Approving Edmonton, Dunvegan and British Columbia Ry. location through tps. 53-56, w. 4 m Alta.

15944 to 15946. Feb. 3. 10.—Authorizing C.P.R. to build spur with three sub-spurs, in Swift Current, Sask.; spur for Frontenac Breweries, Mile End, Que., and spur for D. D. Wood, Winnipeg, Man.

15947. Feb. 12.—General order re rules and regulations for inspection of locomotive boilers, etc.

15948. Feb. 5.—Approving location of G.T.P.R. station site at Stony Plains, Alta.

15949. Feb. 12.—Authrizing G. H. Shaw, G.T.M. Niagara, St. Catharines and Toronto Ry. to prepare and issue tariffs of tolls.

15959. Feb. 8.—Ordering C.P.R. before July 1 to install electric bells at crossing in Coldwater, Ont., 20% to be paid from railway grade crossing fund.

15951, 15952. Feb. 12.—Authorizing C.N.O.R. to cross Ford St., Toronto, and Toronto Suburban Ry., overhead, and to cross seven highways in Etobicoke tp.

15953. Feb. 12.—Ordering Bell Telephone Co. to amend supplement 42, C.R.C. 1708, and providing certain changes in rates to subscribers between Toronto city and island.

15954. Feb. 9.—Authorizing Georgian Bay and Seaboard Ry. (C.P.R.) to cross St. Patrick and Dermot Sts., Ops tp., Ont., at mileage 72.21, and to take certain lands of W. B. Fee for road diversion.

15955. Feb. 6.—Approving location of C.N.O.R. station at Brockville Jct.

15956. Feb. 12.—Ordering Grand Valley Ry. Co. to pay T.H. & B.R. $200 for old diamond at crossing on South Market St., Brantford, Ont.

15957. Feb. 9.—Authorizing C.P.R. to cross with its double track, McTavish St., Fort William, Ont.

15958, 15959. Feb. 9.—Authorizing C.N.O.R. to connect with G.T.R. at Cobourg, and to cross Russell Road, at Junction Gore.

15960. Feb. 14.—Ordering that G.T.R. crossing near Kettle Creek Bridge, St. Thomas, Ont., be protected day and night by watchmen, 15% to be paid by Yarmouth tp., and 15% by city of St. Thomas.

15961. Feb. 15.—General order re freight rates, west of Port Arthur, adding British Columbia to enquiry.

15962. Feb. 15.—Ordering G.T.R. to install within 90 days, electric bell at crossing of Grande Ile Ave., Valleyfield, Jue.

15963, 15964. Feb. 14.—Correcting errors in G.T.P. Branch Lines Co.'s location of Biggar-Calgary branch.

15965. Feb. 12.—Relieving C.P.R. from erecting fences, gates, and cattle guards on portions of Atlantic, Eastern Ontario and Lake Superior Divisions.

15966. Feb. 15.—Authorizing Georgian Bay and Seaboard Ry. (C.P.R.) to use bridges at mileage 20.64, 23.4 and 24.3 at Couchiching Narrows, Ont.

15967. Feb. 3.—Authorizing C.P.R. to build spur for A. Bowerman, Saskatoon, Sask.

15968. an. 31.—Authorizing C.N.R. to cross with its Grosse Isle branch, 12 highways in Woodlands municipality, Man.

15969. Feb .13.—Amending order 15667, Dec. 15, 1911, by substituting new plans re spur for St. Marys Portland Cement Co. and Horse Shoe Quarry, Blanchard tp., Ont.

15970. Feb .15.—Extending to July 1, time for completion of C.N.R. spur in Hudson Bay Reserve, Edmonton, Alta.

15971. Feb .15.—Approving coal chute clearances of G.T.P.R.

15972. Feb. 14.—Authorizing Edmonton, Dunvegan and British Columbia Ry. to cross highways from mileage 0 to 30, Alta.

15973. Feb. 15.—Adding Bentinck tp., Ont., to application re protection of Walkerton and Lucknow Ry. (C.P.R.) crossing.

15974. Feb. 14.—Approving new plan and rescinding order 14066, June 24, 1911, which approved plan for installation of block signals by T.H. & B.R. between Hamilton and Vinemont, Ont.

15975. Feb. 15.—Correcting errors in G.T.P. Branch Lines Co.'s location plan of its Biggar-Calgary branch.

15976. Feb. 16.—Regulating connection between G.T.R. and C.P.R. trains at Brockville, Ont.

15977. Feb. 15.—Approving location of C.N.O.R. station grounds at St. Joseph, Que.

15978. Feb. 14.—Authorizing C.N.O.R. to cross C.P.R. overhead, on lot 11, con. 2, Nepean tp.

15979. Feb. 16.—Correcting errors in G.T.P. Branch Lines Co.'s location of its Biggar-Calgary branch.

15980. Feb. 15.—Authorizing C.N.R. to build spur to Round Hill Collieries, Alta.

15981. Feb. 16.—Approving T.H. & B.R. bylaw authorizing F. F. Backus, G.F. & P.A., and G. C. Martin, A.G.F. & P.A., to prepare and issue tariffs of tolls.

1592. Feb. 14.—Authorizing York tp., Ont., to build bridge over G.T.R. belt line, east of Yonge St., Toronto, and to open up new highway.

15983. Feb. 15.—Authorizing G.T.P.R. to operate spur for P. Burns & Co., Edmonton, Alta.

15984, 15985. Feb. 16.—Approving revised location of C.P.R. Virden-McAuley branch from mileage 14 to 36.27, Man. and Sask., and revised location of Kerrobert northeasterly branch from mileage 0 to 20.2, Sask.

15986. Feb. 16.—Authorizing C.N.O.R. to cross three highways in Nepean tp.

15987. Feb. 16.—Rescinding order 14379, July 22, 1911, and authorizing C.P.R. to divert public road between cons. 7 and 8, Eldon tp., and to cross diversion at mileage 56.4, by overhead bridge, also to compensate J. McArthur for any damages sustained by closhighway.

15988. Feb. 17.—General order re ash pans on locomotives.

15989. Feb. 16.—Authorizing G.T.P.R. to cross C.N.R. with its second track at Empire Ave., Fort William, Ont.

15990. Feb. 15.—Authorizing C.P.R. to build spur for Manitoba Bridge and Iron Works, at Higgins Ave., Winnipeg.

15991. Feb. 16.—Approving revised location of James Bay and Eastern Ry. (C.N.R.) through Demeules tp., Que.

15992. Feb. 16.—Ordering C.N.R. under penalty of $10 a day, to provide farm crossing for E. K. Glidden, Vermilion, Alta., before May 15.

15993. Feb. 15.—Dismissing application of Dominion Sugar Co., Wallaceburg, Ont., re re-adjustment of rates on sugar in carloads from Wallaceburg to Winnipeg and western points.

15994. Feb. 17.—Naming express delivery and collection limits for Kamloops, B.C.

15995. Feb. 16.—General order respecting fireguards.

15996, 15997. Feb. 17.—Approving C.N.R. standard third and second class station plans.

15998. Feb. 6.—Ordering C.P.R. to place a caretaker at Rutter station, between 7 a.m. and 6 p.m. daily, except Sundays.

15999. Feb. 17.—Authorizing Esquimalt and Nanaimo Ry. to build two sidings near Duncans on Vancouver Island for Island Lumber Co.

16000. Feb. 17.—Authorizing C.P.R. to use bridge 4.3 on its Montreal Terminals subdivision, Eastern Division.

16001 to 16003. Feb. 17.—Approving revised locations of James Bay and Eastern Ry. (C.N.R.) through Demeules and Dufferin tps., mileage 24.2 to 24.8, 26.2 to 28.9, and 29.26 to 30.2.

16004. Feb. 15.—Authorizing C.N.O.R. to cross under C.P.R. at Lambton, Ont.

16005. Feb. 16.—Ordering that Toronto tp. pay G.T.R. 20% of cost of watchman at Stave Bank crossing, near Port Credit, Ont.

Regulations for Fireguards in Alberta and Saskatchewan.

The Board of Railway Commissioners passed the following order 15995, Feb. 16, re order 3245, July 4, 1907, respecting fireguards, and the provisions of 8-9 Edward VII., chap. 32, sec. 10. Upon hearing counsel for the Canadian Pacific, Grand Trunk Pacific, and Canadian Northern Railways, as well as perusing applications and suggestions from various persons and public bodies, it is ordered as follows:—

1. Paragraphs 8, 9, 10, 11, 12 and 14 of order 3245 are rescinded.

2. Every railway company subject to the Board's authority, operating a steam railway in Alberta or Saskatchewan, or both, shall, on or before Aug. 1 in each year, construct, along each side of the right of way, and not less than 300 ft. distant from the centre, a fireguard consisting of a plowed strip of land not less than 16 ft. wide.

3. Every railway company shall, between Aug. 1 and Dec. 1 in each year, keep the said fireguards, and each parcel or section of land between them and the railway, free from dead or dry grass, weeds, or other unnecessary combustible matter.

4. Wherever the owner or occupant of land objects to the construction of fireguards, on the ground that it would involve unreasonable loss or damage to property; or where the owner or occupant refuses to allow the construction and maintenance of such guards before the terms and conditions thereof are considered by the Board, pursuant to 8 and 9 Edward VII., chap. 32, sec. 10—the company, in either case, shall at once refer the matter to the Board, giving full particulars thereof, and shall in the meantime refrain from proceeding with the work.

5. No railway company shall permit its employes, agents, or contractors to enter upon land under cultivation to construct fireguards until it has caused to be given to the owner or occupant of such land at least two weeks notice of its intention so to enter.

6. If the agent, employe, or contractor of any railway company leaves gates open, or cuts or leaves fences down whereby stock or crops are injured, or does any other unnecessary damage to property in connection with the construction of fireguards, every such agent, employe, or contractor, shall, in addition to any civil liability for damages, be subject to a penalty of $25 for every such offence.

7. Every railway company shall have the right to apply to the Board to be relieved from the terms of this order where the nature of the country would render it either impossible or useless to construct such guards.

8. Every railway company disobeying or failing to comply with the provisions of these regulations, shall, in addition to any pecuniary liability for damages, be further liable to a penalty of $100 for every disobedience or failure.

RAILWAY DEVELOPMENT.

Projected Lines, Surveys, Construction, Betterments, Etc.

Algoma Central and Hudson Bay Ry.—The junction point of this line with the C.P.R. transcontinental line, about a mile from Hobon, Ont., has been named Franz, after the company's Vice President and General Manager. Several bridges have to be built, and 14 miles of track laid to complete the line through from Sault Ste. Marie, via Hawk Lake Jct., where connection is made with the Michipicoten branch, to Hobon, and it is expected that this work will be finished by Aug. Good progress is reported as being made with the line from Hobon to the National Transcontinental Ry., the junction point with which has been named Grant, and is about 130 miles westerly from Cochrane. (Feb., pg. 67.)

Alberta Central Ry.—See Canadian Pacific Ry. Construction, Betterments, etc., on another page.

Alberta Pacific Ry—The Alberta Legislature has extended the time within which this projected railway may be built. (Jan., pg. 21.)

Ansley Coal Co.—The Medicine Hat, Alta., council has been asked to extend its industrial spur line to the race track to meet a spur proposed to be built from the company's colliery. The new industries committee was asked to report on the matter.

Argenteuil Ry.—Application is being made to the Quebec Legislature to incorporate a company with this title to build a railway on lot 15, 16 or 17 on the boundary between Harrington and Grandville tps., in range 11, to the Grandville canal. in the first range of Grandville tp. Beique, Beique and Beique, Montreal, are solicitors for applicants.

Bagotville and St. Lawrence Ry.—The Quebec Legislature has incorporated a company with this title to build a railway from St. Alphonse or Grand Bay to Murray Bay, Que. The provisional directors are: Mayor Drouin, G. Tanguay, Quebec; A. Lepage, Bagotville, Que.; J. Tremblay, Ste. Anne, Que.; H. Patton, Albany, N.Y. (Feb., pg. 67.)

Burrard Inlet Tunnel and Bridge Co.—The North Vancouver district council has decided to subscribe for an additional $150,000 of stock in the company, bringing its interest in stock in the company up to $400,000, and the North Vancouver town council will at its next meeting consider what further amount of stock it will take. The Shipmasters' Association passed a resolution, Feb. 3, favoring the building of a high level instead of a low level bridge with a swing span as proposed. (Jan., pg. 21.)

Calgary and Fernie Ry.—In the bill before the Dominion Parliament to grant an extension of time for the building of this projected railway, it is also provided that the first section of the act of incorporation, passed in 1906, be amended by substituting of the names of J. R. Lawrey, S. S. Manahan, Victoria, B.C., and A. Mutz, Fernie, B.C., for W. R. Ross. J. S. T. Alexander, I. R. Poole. Fernie, and D. McE. Eberts, Victoria. (Dec., 1911, pg. 1137.)

Central Ry. of Canada.—We are officially advised that a preliminary location has been made from Montreal to Midland, Ont., and from the main line at St. Andrews, Que., to Ste. Agathe, Que. Complete surveys and profile and final location have been made from Montreal to South Indian, via St. Eustache. St. Placide, Oka, St. Andrews, Hawkesbury, McAlpin, Lemieux. A large amount of the right of way has been purchased, including that for a terminal in Montreal. Rails and ties have been ordered for 50 miles. The bridges over Riviere des Prairies, near Montreal, Riviere des Milles Iles, at St. Eustache, and over the Ottawa River at St. Andrews have been commenced. Other construction will be pushed directly weather permits. C. N. Armstrong, Montreal, is Managing Director; F. Stuart Williamson, Montreal, Chief Engineer, and C. J. Wills and Sons. London, Eng., and Montreal, are the contractors.

Chicago, Milwaukee and St. Paul Ry.—A free right of way is reported to have been offered to the company for a line from Fargo to Grand Forks, N.D., the line to be continued from that point to Winnipeg, Man. (Oct., 1911, pg. 935.)

Cochrane and Alberta Ry.—A company with this title has been incorporated by the Alberta Legislature to build a railway from Cochrane to Bonnie Brae coal mine, and thence southerly to the International boundary, about 20 miles. In passing through the house the name of the company was changed from that proposed—the Moose Mountain Ry.—to the C. and A. Ry. Co., and the route was more clearly defined than in the original notice. (See Moose Mountain Ry., Feb., pg. 68.)

Delaware and Hudson Co.—We are officially advised that the Quebec, Montreal and Southern Ry., which, with the Napierville Jct. Ry. form the D. and H. Co.'s lines in Canada, is not building a new bridge over the Yamaska River at Sorel, Que., as stated in press reports. The ice moved one of the piers of the existing bridge in the spring of 1911, and the work being done consists in the tearing down of the old pier, the strengthening of the foundation, and the rebuilding of the pier on the old lines. The only change made has been in the foundation work. F. D. Anthony is Chief Engineer. (Jan., pg. 21.)

Dominion Atlantic Ry.—We are officially advised that the revised location in the vicinity of Allen's Creek, Annapolis, N.S., is being made to secure a better alignment, and for more economical working in connection with the construction of the piers for the new bridge. The present bridge is a wood structure consisting of a Howe truss of 80 ft. span on piers of three braced trestles, each with 39 spans on the east and 20 spans on the west side. The new structure is made up of one 150 ft. through truss steel span with two 80 ft. half deck plate girder flanking spans on concrete piers and abutments. In connection with this there is also to be about 350 ft. of timber trestle, which will afterwards be filled in with earthwork.

Application is being made to the Nova Scotia Legislature to extend the time within which the projected North Mountain extension may be built, in accordance with the conditions prescribed in chap. 156 of the statutes of 1910, and the filing of plans with the Dominion Government. (Feb., pg. 67.)

Dominion Pacific Ry.—The provisional directors named in the application to the Dominion Parliament for the incorporation of a company with this title are:—J. E. Askwith, J. O. Carss, W. R. Askwith, O. E. Culbert, Ottawa; H. McI. McCallum, Regina, Sask. The line proposed to be built would start at the International boundary south of Pincher Creek, Alta., and pass through Calgary and Edmonton to Fort St. John, B.C., with a branch along the Old Man River to the boundary between Alberta and British Columbia. (Dec., 1911, pg. 1137.)

Edmonton, Dunvegan and British Columbia Ry.—In introducing the Alberta Government's legislation for the building of railways in the province, Feb. 6, the Premier said the proposals covered the guaranteeing of the bonds of the E.D. and B.C. Ry. for $20,000 a mile for 350 miles. This line is to be built by a separate company under an agreement with the G.T. Pacific Ry., satisfactory to both companies, and entered into for the more speedy construction of the line. Construction is to be started at once. 100 miles to be completed by the end of 1912.

Press reports state that J. D. McArthur, of Winnipeg, who controls the charter, has purchased 140 acres west of Bronx, lying east of the St. Albert Road, and 13 acres lying north of the G.T. Pacific tracks for terminal purposes. (Feb., pg. 67.)

Esquimalt and Nanaimo Ry.—The extension of the line to Cowichan Lake, B.C., about 18 miles, is expected to be completed and ready for traffic by May 1. The branch leaves the main line about a mile north of Duncan.

The right of way for the proposed extension from McBride Jct. to Union Bay is being cleared. The work is being prosecuted from the Union Bay end, and was reported to have reached beyond Oyster River, Jan. 31.

Plans have been filed with the Provincial Minister of Railways for an extension of the line now terminating at Port Alberni, by way of Sproat River and Sproat Lake to Great Central Lake. (Feb., pg. 67.)

Glengarry and Stormont Ry.—The Ontario Legislature is being asked to incorporate a company with this title to build a railway from the C.P.R. in Lancaster tp., Glengarry county, near the eastern boundary of the province, southerly and westerly to the St. Lawrence River, then westerly to Cornwall, Ont., with branch lines. C. L. Hervey, civil engineer, is interested in the promotion of the company.

Green Bay to Bay of Islands, Nfld—The Quebec board of trade has been informed that the Newfoundland Legislature proposes to vote a subsidy of $75,000 a year to a London, Eng., syndicate, which plans to build a railway from Green Bay to Bay of Islands, Nfld., and to operate a car ferry from the latter point to Gaspe, Que., or Dalhousie, N.B. Green Bay is proposed as the terminus of a fast line of steamships running from England or Ireland.

High River, Saskatchewan and Hudson Bay Ry.—The provisional directors named in the bill now before the Dominion Parliament asking for the incorporation of a company with this title are:—H. N. Sheppard, F. Crandall, T. E. Le Claire, C. A. Gigot, G. T. Stanley, High River, Alta. (Feb., pg. 67.)

Hudson Bay, Peace River and Pacific Ry.—A special general meeting of shareholders has been called to be held in Winnipeg, Mar. 12, to authorize the issue of bonds, debentures and other securities. H. W. Adcock, Winnipeg, is Secretary. (Feb., pg. 67.)

Intercolonial Ry.—In connection with the project to build a branch line from Sunnybrae to Guysborough and Country Harbor, for which a contract was let by the late Government to the Nova Scotia Construction Co., at an estimated cost of $1,057,122.19, and for which an appropriation of $1,000,000 was voted in 1911, the Minister of Railways said in the House of Commons Feb. 1:—"Surveys of the whole of the railway had not been completed before tenders were invited. The first location of the line was from Sunnybrae easterly along the east branch of the St. Marys river through the county of Pictou, thence southeasterly to Melrose in Guysborough county. Another location which was urged was one from Sunnybrae

southerly following Barren Brook to the west branch of St. Marys river, thence easterly through Guysborough county to Melrose, a common point to both locations. The last mentioned location was examined only in a preliminary way. The question as to which of these routes should be adopted had not been settled. No reliable estimate of the cost of the work had been made. There not being at hand sufficient information to show that there was justification for the building of the line and the incurring of the outlay, it was thought well to cancel the contract and abandon the proceedings until complete and reliable data and information could be obtained, and the Minister satisfied that, before committing the country to the expenditure, the same is justified. The Government had acquired the line known as the Sunnybrae branch from the Nova Scotia Steel and Coal Co. for $100,000. The remarks as to the obtaining of reliable data and information which would justify the building of the line, applied to the proposed line between Dartmouth and Dean's Settlement, N.S.

We are officially advised that no tenders have been accepted by the Department of Railways for the building of the branch line from Alba to Baddeck, N.S. The papers with regard to this proposed line are by order of the House of Commons, Feb. 5, to be laid on the table. The Minister of Railways in a statement said the two tenders submitted averaged $69,000 a mile, and as only $200,000 had been voted on account of the work, he could not see his way clear to allow it to go on. The proposed line is 22 miles long, and the engineer's estimate of the cost was $1,485,000. The Minister added that it was the intention of the Government to investigate the matter and see if a cheaper route could be got. The member who asked for the papers stated that it was a level country and easy to build a railway through, yet the estimated cost, according to the tenders submitted, was $69,000 a mile.

A press report, Feb. 12, states that M. P. and J. T. Davis have started work near Dartmouth, N.S., on the line from Dartmouth to Dean's Settlement. (Feb., pg. 67.)

Kaslo and Slocan Ry.—It is said that an agreement has been arrived at between the company and the British Columbia Government for putting in operating condition the remaining section of the K. and S. Ry., and that the agreement will be submitted to the Legislature for confirmation. Later reports state that an arrangement has been made by which the line will be taken over by the C.P.R. (Nov., 1911, pg. 1035.)

Kettle Valley Lines.—Press reports state that a spur line will be built to Skaha Lake, and that the Okanagan River will be dredged so as to permit of the operation of steamboats in connection with the spur line.

Application will be made to the Board of Railway Commissioners in Ottawa, Mar. 5, for authority to build with the Vancouver, Victoria and Eastern Ry. of a joint track from the summit of the Hope Mountains, down the Coquihalla Valley, 26 miles, to Hope. The valley, it is stated, will only permit of the building of one line, and the maximum gradient will be 2%.

Lac Seul, Rat Portage and Keewatin Ry.—Application is being made to the Ontario Legislature for an extension of time within which the line authorized to be built by chap. 128 of the statutes of 1908 may be built. J. F. McGillivray, Kenora, Ont., is solicitor for applicants. (June, 1910, pg. 449.)

Lindsay and Minden Ry.—Application is being made to the Ontario Legislature to incorporate a company with this title to build a railway, to be operated by steam, electricity or other motive power, from Lindsay to Minden Lake, in Minden tp., or to Bexley, or such other point as may be necessary to connect the same with other railways, and to build branch lines. J. H. Delemere, Minden, Ont., is solicitor for applicants.

Magrath Coal Co.—Application is being made to the Alberta Legislature to authorize the Magrath Coal Co. to build a railway, to be operated by electricity or other power, from its colliery in sec. 2, tp. 7, range 22, west 4th meridian southerly to Magrath. Shepherd and Dunlop, Lethbridge, Alta., are the solicitors.

Midland Continental Ry., etc.—Press reports state that the Midland Continental Ry. has secured funds for building its projected railway from Jamestown, N.D., to Winnipeg, Man., and that construction on the first 50 miles out of Jamestown, will be started in April. F. K. Bull, Racine, Wis., is President. (Sept., 1911, pg. 855.)

Minneapolis, St. Paul and Sault Ste. Marie Ry.—An officer is reported by a U.S. paper as saying that the company intends to build during the current year a connecting line from Drake, N.D., northeast to Fordville, 175 miles.

Moncton and Buctouche Ry.—E. G. Evans, Manager, is reported to have stated, Feb. 9, that surveys are being made with the view of extending the line from Buctouche to Richibucto, N.B., and that it is expected to start construction during the summer. Local press reports state that the extension is to be made with a view to establishing a car ferry service between Richibucto and Summerside, P.E.I.

Montreal and Northern Colonization Ry.—Application is being made to the Quebec Legislature to extend the time for the building of the projected railway, to authorize its being built through Joliette and L'Assomption counties; the building of branch lines; its connection with the National Transcontinental Ry., and the securing of an entrance into Montreal by a tunnel. (May, 1911, pg. 411.)

Montreal Tunnel Proposal.—A deputation, headed by Duncan McDonald, General Manager, Montreal Tramways Co., and accompanied by P. Feurot, representing the engineering firm of Jacobs and Davis, New York, waited on members of the Dominion Government, Feb. 12, to discuss the tunnel project. The company's plans include the building of a railway tunnel under the St. Lawrence River from Longueuil or St. Lambert, and under the city, coming out near Jacques Cartier Jct. The tunnel would be large enough for tracks for steam and electric railways, as well as ordinary traffic, and is said to be a new proposal entirely independent of any other previously proposed project. The Government promised to give full consideration to the proposals when they were matured and plans presented.

Northern Territorial Ry.—In the measure before the Dominion Parliament providing for the incorporation of a company with this title to build a railway from Fort Churchill to the Pacific coast at Port Essington, B.C., with a branch to Edmonton, Alta., the following are named provisional directors:—W. T. Stuart, Toronto; L. P. Sherwood, Ottawa; G. E. Holmes, R. Wilson, Saskatoon, Sask.; H. G. H. Neville, Edmonton, Alta. (Jan., pg. 22.)

Oregon-Washington Rd. and Navigation Co.—J. D. Farrell, President, in a recent interview at Vancouver, B.C., is quoted as saying: "We have decided to extend our line to Vancouver, but just when a start will be made is uncertain owing to the financial situation. The route has been carefully looked over and we will get right into the heart of the city." During his stay in Vancouver Mr. Farrell and the officials who were with him interviewed the Northern Pacific Ry.'s local officials and visited the water front, where the new Great Northern Ry. terminals are being laid out.

The Pacific Trans-Canada and Hudson Bay Ry. Co., the incorporation of which is before the Dominion Parliament, proposes to build a railway from Edmonton, Alta., to Fort Churchill, on Hudson Bay, with a branch line through Laurier pass to Prince Rupert, B.C. The provisional directors are: G. W. Swaland, M. Kimpe, P. O. Dwyer, Jas. Smith, Edmonton, Alta.; W. Johnston, Ottawa. (Oct., 1911, pg. 937.)

Prince Edward Island Ry.—The Minister of Railways recently stated in the House of Commons that surveys will be made to determine the points on P.E.I. and the mainland between which the proposed carferries will ply, and also as to the other works required, and that as soon as the necessary information is obtained, and the specifications prepared, tenders will be invited and the work gone on with without delay. It is expected to have the work completed within two years. It is intended to widen the P.E.I. Ry. to standard gauge, and this work will be carried on as soon as practicable. (Feb., pg. 68.)

Prince Edward Island Ry.—We are officially advised that no tender has yet been accepted for the building of the proposed branch lines from Clifton Bridge to Stanley Bridge, and from O'Leary to West Point.

A press dispatch from Ottawa states that the estimated cost of the car ferry and the changing of the gauge of the line is $1,340,000. The cost of the car ferry is put at $450,000; the changing of the gauge at $400,000, and the cost of a third rail at $490,000. This would imply that it is proposed to operate the line as a standard and narrow gauge line, the existing rolling stock being used for local traffic, and the standard gauge rolling stock of the Intercolonial Ry. being used only for through traffic from and to the island. (Feb., pg. 68 and pg. 71.)

Quebec and Saguenay Ry.—The Department of Railways has entered into a contract with the company under the act granting aid to certain railways, for the building of 170 miles of railway from St. Joachim towards Seven Islands, and including branches to Murray Bay and Baie St. Paul, Que. The first section of this line is under construction, and a part of the line from Murray Bay inland for about seven miles has been completed. (Feb., pg. 68.)

Quinze River and Ottawa Ry.—The Dominion Parliament is being asked to incorporate a company with this title, but the bill as introduced does not state between what points it is proposed to build a railway. The provisional directors are: J. A. O'Brien, F. W. Ross, P. L. Smyth, Montreal; S. G. McClenahan, W. Johnston, Ottawa. (Oct., 1911, pg. 937.)

Reid Newfoundland Ry.—W. D. Reid, President, Reid Newfoundland Co., in an interview Feb. 2, is reported to have said it was the company's intention to add 70 miles of line to its system during the year. (Dec., 1911, pg. 1139.)

St. Charles and Huron River Ry.—See Canadian Northern Ry. Construction, Etc., on another page.

St. John and Quebec Ry.—The New Brunswick Legislature is being asked to pass one or more acts respecting "The Valley Railway, so called," which is to be built by the St. J. and Q. Ry. Co. under a contract between the province and the company. The new powers proposed provide for the incorporation of sep-

arate companies, or for conferring special powers on the St. J. and Q. Ry. Co. for the building of bridges, at Andover, The Mistake and Perry's Point; and an additional act confirming an issue of first mortgage bonds up to $25,000 a mile, and second mortgage bonds up to $10,000 a mile.

Preliminary surveys have been made for the whole route, and have been approved by the Minister of Railways. The company is now making final location and revision surveys between Fredericton and Woodstock, and from Fredericton southerly towards Gagetown. Three parties are in the field:—no. 1, under L. B. Lincoln, with headquarters at Woodstock; no. 2, under B. M. Hill, and no. 3, under S. B. Wass, the headquarters of parties 2 and 3 being at Fredericton. Ross Thompson is Chief Engineer.

It is probable, we are advised, that one contract will be let for the building of the whole line, but if not the contracts will be for 30 mile sections. Construction will be started as soon as possible. (Feb., pg. 62.)

Seymour Narrows Bridge Proposals.—The Victoria, B.C., city council has appointed a committee to confer with other committees to be appointed with respect to the proposal to build a railway and general traffic bridge across Seymour Narrows, to connect Vancouver Island with the mainland. At a meeting of the committees, representing Vancouver Island, Feb. 1, it was decided to invite the co-operation of the Provincial Legislature and the Dominion Parliament in the project, and to prepare all the statistical information necessary to present the case before the governments. A resolution was passed favoring the building of a bridge across the Narrows at an early date.

Southern Alberta Ry.—The Alberta Legislature is being asked to extend the time within which the company may build the lines authorized by chap. 40 of the statutes of 1909. White and Laidlaw, Lethbridge, Alta., are solicitors for applicants.

Superior Coal Co—Surveys are reported to have been made for a line from the Coulee, just west of Taber, Alta., through Superior, and northerly to connect with the projected line of the Canadian Northern Ry. The maximum gradient, it is stated, will not exceed 1.5%. B. K. Bullock is representing the company.

Temiskaming and Northern Ontario Ry.—The speech from the throne at the opening of the Ontario Legislature Feb. 9, after a reference to the increase in the net earnings of the railway for the year 1911, to $593,000 from $420,000 in the previous year proceeded:—"The branch to Porcupine has been completed, and there is now 300 miles of the railway in operation, while another branch is being located from the main line to Elk Lake. An agreement has been entered into between the T. and N.O.R. Commission and the G.T.R. Co., granting the latter running rights over the T. and N.O.R., in consideration of which the G.T.R., in addition to an equitable share of the general maintenance of the road, agrees to pay $300,000 a year as rental for such running rights —this sum representing half the interest on the total cost of the construction of the line."

A deputation waited on the Ontario Government Jan. 31, asking that the line be extended from the present end of the Porcupine branch for about 70 miles, to a junction with the Canadian Northern Ry. at Ruel, and that an arrangement be made with that company to run over its tracks from Ruel to Sudbury.

J. L. Englehart, Chairman of the Commission, is reported to have stated in an interview Feb. 13, that tenders would be asked at an early date for the building of the branch into the Elk Lake region, about 30 miles. The surveys for the branch had been completed.

J. L. Englehart, Chairman, T. and N.O.R. Commission, is reported to have stated at Cobalt, Feb. 21, that the Elk Lake branch will start from the main line at Earlton, 129 miles north of North Bay, and not from Charlton, as first reported. Charlton is the terminus of the Charlton branch, which runs to that point from Englehart, 8 miles.

In connection with the surveys for the projected extension of the line from Cochrane to James Bay, the Ontario Government has authorized the making of a further geological survey along the projected route, and an examination of the shores of James Bay, with a view to securing a suitable terminal. S. C. Ellis is in charge of the survey, which it is expected will be completed by Sept. 30. (Jan., pg. 23.)

Toronto, Hamilton and Buffalo Ry.—Press reports state that a line is being staked out on either side of the tunnel in Hamilton, with the view of securing an additional right of way. (Feb., pg. 68.)

Winnipeg City Power Line.—The Winnipeg city council has decided that for the present the railway from Lac du Bonnet to the city power plant at Point du Bois, shall continue to be operated by J. G. Rossman, Manager of the city's light and power department. (Jan., pg. 24.)

Winnipeg North Eastern Ry.—The Manitoba Legislature is being asked to authorize the company which was incorporated by chap. 116 of the statutes of 1911, to amalgamate with other companies. Mulock, Loftus, Armstrong and Lindsay, Winnipeg, are solicitors for the company. (May, 1911, pg. 413.)

Winnipeg River Ry.—Application is being made to the Manitoba Legislature for an act amending chap. 117 of the statutes of 1911, by authorizing amalgamation with other companies. Mulock, Loftus, Armstrong and Lindsay, Winnipeg, are solicitors for the company. (May, 1911, pg. 413.)

Car Distribution for Grain Transportation.

The Minister of Trade and Commerce introduced a bill into the House of Commons, Feb. 2, providing for an amendment of sub-sec. 99b, sec. 41, chap. 45, of the statutes of 1908, regarding the distribution of cars for the transportation of grain in the discretion of the Grain Commissioner. The section, when amended, will read as follows: "The Commissioner shall have power in his discretion to order cars to be supplied, contrary to the provisions of this Act, to elevators that are in danger of collapse, to places where grain is damp and liable to become damaged, or for the purpose of distributing seed grain to any point in the Western Division, or in cases where the operator of any country elevator or warehouse reports in writing under oath that some portion of the grain in his elevator or warehouse is heated, and that in order to preserve the same it is necessary to ship such heated grain to the terminal elevator for treatment, provided, however, that no relief shall be granted in such last mentioned cases as long as the warehouseman has plenty of room in his building for the rehandling of such grain."

The Victoria Construction Co. has been incorporated under the New Brunswick Companies Act with a capital of $99,000, and office at Grand Falls, N.B., to carry on a railway and general contracting business. The provisional directors are:—J. L. White, H. M. Dowling, B. A. Puddington, J. J. McLean, Grand Falls; T. J. Carter, Andover, N.B.; E. R. Teed, Woodstock, N.B.; D. A. McDonald, Antigonish, N.B.

Great Northern Railway Lines in Canada.

United States press reports state that the company has in hand ample funds, from the sale of $25,000,000 of 4½% bonds last year, for the carrying out of its construction programme for that year. The work to be done during the year, it is stated, includes the completion and extension of several of its lines in Canada.

Midland Ry. of Manitoba—Midland Great Northern Ry.—We are officially advised that the total length of main line from St. James Jct., on the Canadian Northern Ry. Winnipeg-Emerson line, to the new freight house at Winnipeg, is 5.86 miles. The tracks in the yard have also been laid. The figure mentioned in our report of track laid in 1911, eight miles, was based on the company's report that "about eight miles of track" were expected to be laid on the line into Winnipeg.

It was reported in Winnipeg, Feb. 3, that everything was ready for the operation of G.N.R. trains into the company's Winnipeg terminals. The steel work on some of the subways was not fully completed, but it was expected that it would be finished by the end of February.

Vancouver, Victoria and Eastern Ry. and Navigation Co.—W. H. Burns, engineer in charge of surveys in the Hope Mountain district, arrived in Hope, B.C., Feb. 6, and it is said that he is making arrangements for again starting up construction on the section of the line from Princeton to Hope. The question of the route is not yet finally decided, and application will be made to the Board of Railway Commissioners at Ottawa, May 5, for approval of the building of a joint track with the Kettle Valley Ry. from the summit of the Hope Mountains down to Hope. The ground for the application is that there is only room for a single track along the Coquihalla valley for about 26 miles. Part of this line would be on a 2% gradient. It is stated that the negotiations between the two companies are practically completed. From near Hope the company will run over the Canadian Northern Pacific Ry. to near New Westminster.

Vancouver Terminals. — The company's freight and passenger staff have moved into their offices at 314 Hastings St., Vancouver.

The Vancouver city council has passed a resolution urging the company to resume and press forward the reclamation works at False Creek. The work done up to the present has been largely of a preliminary character. Under the agreement the company has until April 9 to begin the real work of reclamation.

The proposed dock, west of the sugar refinery, plans for which are being prepared, will be 1,200 ft. long, and will be built on concrete piling. An approach of about 200 ft. is being built, and the dredging will be done as the dock is being built. (Feb., pg. 70.)

Lists of Locomotives—The Board of Railway Commissioners issued order 15947, Feb. 12, requiring all railway companies under the Board's jurisdiction to file with the Board's Chief Operating Officer within 30 days a list showing the numbers of all locomotives owned or leased by them; and also to file from time to time with the Chief Operating Officer a list giving the numbers of all additional locomotives that may be purchased, built, or leased.

A. and W. D. Wheaton, railway contractors, Amherst, N.S., who have subscribed to the Railway and Marine World for several years, in renewing their annual subscription, write: "The Railway and Marine World is steadily growing larger and better."

Mainly About Transportation People.

Edwin Hawley, President, Minneapolis and St. Louis Rd., died in New York Feb. 1.

R. W. Reford, steamship agent, etc., has been elected President of the Montreal Board of Trade.

Willis Chipman, B.A.Sc., M. Can. Soc. C.E., has been elected President of the Engineers' Club of Toronto.

W. C. Dodds, of the General Passenger Department, Canadian Northern Ry., Winnipeg, died there Jan. 20.

J. E. Laughlin, station agent, G.T.R., Windsor, Ont., is reported to have resigned after 12 years service there.

Sir Wm., Lady Whyte and Miss Whyte left Winnipeg, Feb. 5, for Augusta, Ga., where they will remain for some time.

J. M. Fotheringham, A.M. Can. Soc. C.E., District Engineer, Grand Trunk Pacific Ry., Quebec, died there, Feb. 6.

Mrs. Lash, wife of Z. A. Lash, K.C., director, and Senior Counsel, Canadian Northern Ry., Toronto, died there, Feb. 13.

H. J. Cambie. Chief Engineer, Esquimalt and Nanaimo Ry., returned to Vancouver, B.C., from a trip to Europe, Feb. 12.

C. E. Ritchie, President, Central Ontario Ry., Akron, Ohio, has been elected Vice President, Trusts and Guarantee Co., Toronto.

W. L. Garland, barrister, Winnipeg, who died there Feb. 23, aged 26, was the younger brother of Mrs. D. B. Hanna, of Toronto.

G. Belanger, agent Quebec Central Ry. at Morisset, has been appointed a justice of the peace for the county of Dorchester, Que.

Sir C. Rivers Wilson, formerly President of the Grand Trunk Ry. Co., has resigned from the British Electric Traction Co.'s board.

J. C. Hickson, K.C., who died in Montreal, Feb. 2, aged 37, was a son of the late Sir Jos. Hickson, at one time General Manager, G.T.R.

Sir Edmund Osler and W. D. Matthews, C.P.R. directors, Toronto, accompanied Sir William Van Horne on his visit to Cuba, Feb. 15.

J. Brownlee, Superintendent, District 1, Manitoba Division, C.P.R., Kenora, Ont., died there, Feb. 26, after a comparatively short illness.

H. W. Brodie, General Passenger Agent, C.P.R., Pacific Division, and Mrs. Brodie, returned to Vancouver, Feb. 15, from a trip to Honolulu.

F. L. Wanklyn, formerly Managing Director, Montreal Street Ry., has resigned his position as a member of the Montreal city board of control.

Lord Strathcona, who has been suffering from influenza, was reported, Feb. 24, to be improving, his physical strength being well maintained.

Mrs. Hogan, wife of M. J. Hogan, contractor for the Port Colborne, Ont., breakwater, died there, Feb. 5, of pneumonia and was buried in Montreal.

G. W. Hardisty, District Passenger and Freight Agent, Northern Pacific Ry., Montreal, died at Chateauguay, Que., Feb. 9. He was formerly in G.T.R. service.

Frank Potter has been appointed General Manager of the Great Western Ry. of England, succeeding the late Sir John Inglis, to whom he was chief assistant.

Geo. Kitchen, who died at Fredericton, N.B., Feb. 9, was a contractor on several important works in the maritime provinces, including bridges and other work on the C.P.R.

In our February issue it was stated that John Paul, District Freight Agent, Canadian Northern Ry., Winnipeg, was born in 1853. The date should have been given as 1858.

G. Cobb, Chief Dispatcher, Reid Newfoundland Co., St. John's, Nfld., returned to duty, Feb. 8, from Bay of Islands, where he had been recuperating after an operation for appendicitis.

C. G. Washbon, of the C.P.R. engineering staff, was married at Brandon, Man., Feb. 7, to Miss M. Coldwell, daughter of Hon. G. R. Coldwell, Minister of Education for Manitoba.

Colin Rankin, of Mattawa, Ont., formerly chief factor, Hudson's Bay Co., has been appointed a police magistrate for the National Transcontinental Ry., succeeding P. J. Loughrin.

Sir Donald Mann, Vice President, Canadian Northern Ry., returned to Toronto, Feb. 22, from the Pacific coast, where he spent several weeks recuperating after his recent illness.

P255 James Morrison,
Secretary, Niagara Frontier Summer Rate Committee and Great Lakes and St. Lawrence River Rate Committee.

T. P. Brennan, who died suddenly in his office in Montreal, Feb. 20, was engaged as a contractor on the St. Lawrence and Adirondack Ry., and on sections of the C.P.R. in the west.

W. F. Buck, M. Am. Soc. M.E., Superintendent of Motive Power, Atchison, Topeka and Santa Fe Ry., died of pneumonia in his private car whilst en route to Los Angeles, Calif., on Jan. 31.

Sir Thos. G. Shaughnessy will, according to press reports, build a 10-story office building on his property at the northeast corner of McGill and St. Paul Streets, Montreal.

Sir Donald Mann was a passenger on a Great Northern Ry. train which ran into a mud and rock slide near Ocean Park, B.C., Jan. 28. Only one passenger on the train received injuries.

Sir Rodolphe Forget has promised $50,000 to the Notre Dame Hospital, Montreal, if a similar amount is contributed by others, and $100,000 if 90 subscriptions of $5,000 each are secured.

Mrs. W. Nickle, who died at Kingston, Ont., Feb. 1, was a sister of B. W. Folger, Sr., Kingston, and mother of H. C. Nickle, Superintendent Kingston, Portsmouth and Cataraqui Electric Ry.

E. L. Brown, formerly General Superintendent, Western Division, Great Northern Ry., at Spokane, Wash., has been appointed Vice President and General Manager, Denver and Rio Grande Rd.

A. B. Overland, a construction engineer on the Canadian Northern Ontario Ry. at Pearl, Ont., is reported to be recovering from a severe illness for which he was treated in the hospital at Fort William, Ont.

M. J. Haney, M. Can. Soc. C.E., contractor, who has been confined to his house at Port Credit, near Toronto, since his return from the South, recovering from a bad attack of influenza contracted in Panama, is convalescent.

L. A. Hamilton, ex-Land Commissioner, C.P.R., now living in Toronto, is one of the directors of the Canada Timber and Lands, Ltd., which was incorporated recently under the Dominion Companies Act, with a capital of $250,000.

Mrs. Carr, wife of C. E. A. Carr, formerly General Manager, Quebec Ry., Light, Heat and Power Co., and now of New Orleans, La., is a daughter of J. S. and Mrs. Williams, who celebrated their golden wedding in Toronto, Feb. 21.

The Directory of Directors, published by Sir Thos. Skinner, director, C.P.R., states that Sir Wm. Van Horne is director of 21 companies, Sir Wm. Mackenzie, Sir H. Montagu Allan and Lord Furness of 20 companies, and Sir Henry M. Pellatt of 18 companies.

A. Butze was presented with a silver loving cup by the headquarter officials of the G.T.R. at a dinner at St. James' Club, Montreal, recently, on his retiring from the company's service, in which for 16 years he was General Purchasing Agent.

C. W. Johnston, Chief Clerk to W. P. Hinton, General Passenger Agent, G.T. Pacific Ry., Winnipeg, was presented with a diamond ring, on his transfer to the G.T.R. passenger department, Montreal. Mrs. Johnston was also presented with some cut glass.

Mrs. Eldridge Stanton, who with her husband was drowned at Niagara Falls, Feb. 4, owing to the breaking away of the ice bridge over the river while they were on it, was a daughter of N. R. Butcher, official stenographer, Board of Railway Commissioners.

Sir William Van Horne visited Cuba in the early part of February, to look after his interests in the Cuba Rd. and other properties. He stated that owing to the general prosperous condition of affairs in Cuba, his visits to the island would be less frequent.

H. J. Cowie, European Freight Agent, and T. Howell, General Immigration Agent, Canadian Northern Ry., arrived in Liverpool, Eng., Feb. 10, the former after a business trip to Canada, and the latter to make arrangements for the forthcoming season's work.

A. M. Nanton, Managing Director, Alberta Ry. and Irrigation Co., Winnipeg, and Mrs. Nanton were among the Canadians who attended the thanksgiving services at St. Paul's Cathedral, London, Eng., Feb. 6, for the safe return of the King and Queen from India.

Major Leonard, Chairman, National Transcontinental Railway Commission, was the principal guest at a dinner given by the Royal Military College Cadets' Club, Montreal, recently, at which he spoke of the importance of the new line from a military point of view.

Capt. Blakeney, R.N., who died at Bath, Eng., recently, was present at the launching of the Beaver in 1834, and was an officer on board the vessel when she was engaged on survey work on the

coast of British Columbia. The Beaver was the first steamship on the Pacific coast of Canada.

Jas. Slatterie, foreman tender department, G.T.R. shops, Stratford, Ont., was presented with an easy chair and a pipe from the men on his retiring after nearly 40 years' service. The presentation was made by R. Patterson, Master Mechanic.

Sir Wm. Mackenzie, President, Canadian Northern Ry., returned to Toronto, Feb. 3, from a trip to the Pacific coast, and subsequently, accompanied by D. B. Hanna, Third Vice President, went to Ottawa, Montreal, Quebec and Halifax, from whence they returned to Toronto, Feb. 9.

C. W. Power, who has been appointed Railway and Bridge Engineer, City Engineer's Department, Toronto, succeeding E. L. Cousins, appointed Engineer to the Toronto Harbor Commission, was formerly Resident Engineer, Middle Division, G.T.R., Toronto, in which position he also succeeded Mr. Cousins.

Gordon H. O'Hara, who has been appointed General Passenger Agent for Ontario, Allan Line, Toronto, was born at Montreal, June 22, 1879, and entered Allan Line service, Feb. 1, 1894, since when he has been in the inward freight, outward freight, passenger, and accounting departments, and has been acting cashier at intervals.

Sir Donald Mann, Vice President, Canadian Northern Ry., Colonel Davidson, Land Commissioner, and T. G. Holt, Executive Agent for British Columbia, were the principal guests at a dinner given by the New Westminster Board of Trade, Feb. 7. Sir Donald left for the east, Feb. 15, stopped over at Winnipeg, and reached Toronto, Feb. 22.

C. F. Cox, Treasurer, Toronto, Hamilton and Buffalo Ry., and of New York Central lines west of Buffalo, who died at Yonkers, N.Y., recently, was born at Staten Island, N.Y., Jan. 16, 1846. He entered the Canada Southern Ry. service in 1869, and was, successively, Accountant, Assistant Treasurer, Secretary, Vice President and President. The whole of his railway service has been with the Vanderbilt lines.

R. G. McMillan, excursion clerk, and M. Hagerty, advertising clerk, District Passenger Agent's office, G.T.R., Toronto, were presented with a correspondence portfolio and a gold locket, respectively, the former on his transfer to a similar position in the General Passenger Agent's office, G.T.P.R., Winnipeg, and the latter on leaving G.T.R. service to take a similar position in the District Passenger Agent's office, C.P.R., Toronto.

James Morrison, whose portrait appears in this issue, and who is chief rate clerk, Passenger Department, C.P.R., Montreal, has been Secretary of the Niagara Frontier Summer Rate Committee, and of the Great Lakes and St. Lawrence River Rate Committee for several years, and was re-elected at the annual meetings held at Detroit, Mich., recently, the appointment for the Niagara Frontier Summer Rate Committee being made a permanent one.

Hon. F. Cochrane, Minister of Railways and Canals, Sir Thos. G. Shaughnessy, President, C.P.R., C. M. Hays, President, G.T.R. and G.T.P.R.; Sir Wm. Mackenzie, and Sir Donald Mann, President and First Vice President, respectively, Canadian Northern Ry., will compose the Military Transport Board, which the Minister of Militia recently announced was being formed in connection with the Militia Department. They will be given the rank of honorary Colonel.

W. D. Reid, President, Reid Newfoundland Co., on behalf of himself and brothers, has offered to the Newfoundland Government to build and equip in St. John's a tuberculosis hospital at a cost of $50,000, and a sanitarium in each of the 16 external electoral districts at a cost of $3,000 each, on sites to be provided by the Government; the hospitals to be managed and controlled by the Government. The Government has accepted the offer, and propose to name the buildings "The Reid Sanitaria."

The following retired employes of the Canadian Government railways have granted the Imperial Service Medal, in recognition of meritorious service:—G. L. Blais, Levis, Que.; baggage master; F. Davison, Truro, N.S., conductor; A. Gifford, baggage master, Moncton, N.B.; H. W. Henderson, track foreman, York, P.E.I.; E. Jobin, Quebec, baggage master; W. Languille, Brookfield, N.S., track foreman; T. Morency, Trois Pistoles, Que., track foreman; J. O'Malley, Halifax, N.S., freight checker; J. O'Rourke, Moncton, N.B., watchman; L. Proulx, Quebec, conductor.

W. J. Meakin, whose appointment as Locomotive Foreman, C.P.R., Castor, Alta., was announced in our last issue,

P 256 W. J. Press.

Mechanical Engineer and Machinery Expert, National Transcontinental Railway.

was born at Toronto, Aug. 22, 1869, and entered transportation service in 1885, in the navigation of Georgian Bay, eventually obtaining a master's certificate and operating a steam tug for the French River Boom Co., for 13 years. He entered C.P.R. service, Oct. 15, 1908, at Strathcona, Alta., as a laborer, and in the summer of 1909, was given charge of the stationary boiler, pumping and heating plant there. From Dec. 1, 1910, to Jan. 5, 1912, he was shop foreman at Strathcona roundhouse.

A. E. H. Chesley, who has been appointed General Accountant, Dominion Atlantic Ry., Kentville, N.S., was born near Annapolis Royal, N.S., Aug. 27, 1877, and entered railway service, Oct. 23, 1893, since when he has been, to Oct. 4, 1894, agent and telegraph operator, Yarmouth and Anapolis Ry.; Oct. 4, 1894, to Nov. 4, 1895, agent and telegraph operator, Dominion Atlantic Ry.; Nov. 4, 1895, to Aug. 24, 1897, clerk, Traffic Auditor's office; Aug. 24, 1897, to Oct. 1, 1899, clerk in Accountant's office; Oct. 1, 1899, to June 1, 1907, chief clerk, Accountant's office; June 1, 1907, to Feb. 1, 1912, Assistant Accountant, all with Dominion Atlantic Ry.

W. L. Upson, General Manager of the projected Ottawa, Smiths Falls and Kingston Ry., was born at Canisteo, N.Y., in 1853, and started work in 1869 as water boy on a construction train between Hornellsville and Susquehanna, N.Y., advancing successively to the positions of timekeeper, brakeman and conductor, the latter appointment being received before he was 20. While serving as brakeman and conductor he studied telegraphy, and in 1873 was appointed night operator at Dalton, on the Erie Rd. In 1874 he was appointed freight agent at Main St., Buffalo, and in 1882 construction train conductor, West Shore Rd. Subsequently he became identified with the organization and building of several lines and was General Manager of the Buffalo, Hamburg and Aurora Ry.

D. J. Murphy, Jr., who has been appointed Superintendent of Transportation, Dominion Atlantic Ry., and whose portrait appears in this issue, was born at Caledonia, Ont., Mar. 3, 1874, and entered railway service Apr., 1892, since when he has been, to Mar., 1893, clerk in local freight office, Yarmouth and Annapolis Ry., Yarmouth, N.S.; Mar. to Nov., 1893, assistant agent, same road, Yarmouth, N.S.; Nov., 1893, to May, 1894, relieving agent, same road; May, 1894, to 1896, operator and relieving dispatcher, Dominion Atlantic Ry., Kentville, N.S.; 1896 to 1900, dispatcher, same road; 1900 to 1906, Chief Dispatcher, same road; 1906 to 1908, Trainmaster, same road, with supervision over car service; 1908 to Jan. 31, 1912, Assistant Traffic Superintendent, same road.

John Corbett, who has resigned the position of General Foreign Freight Agent, C.P.R., Montreal, to enter private business, as mentioned in our last issue, was born in Lanarkshire, Scotland, July 19, 1863, and commenced railway service in 1877 with the Caledonian Ry. He came to Canada in 1882, since when he has been, Nov., 1882 to Dec., 1883, in Audit Department, G.T.R., Montreal; Dec., 1883, to May, 1885, in the office of the Blue Line, Montreal; May, 1885, to Mar., 1904, in Foreign Freight Department, C.P.R., Montreal; Mar., 1904, to Jan., 1912, General Foreign Freight Agent, C.P.R., Montreal. He was entertained at luncheon at the Montreal City Club, Feb. 6, by the local transportation men, and at the Canada Club, Montreal, Feb. 8, by the members of the Montreal Corn Exchange.

R. A. Pyne, whose appointment as Superintendent of Shops, C.P.R., Winnipeg, was announced in our last issue, was born at Toronto, Apr. 10, 1874, and entered railway service, July, 1887, since when he has been, to May, 1893, apprentice C.P.R. shops, Winnipeg; May, 1893, to Dec., 1898, fitter and lathe hand, and Dec., 1898, to July, 1899, gang foreman, there; July, 1899, to Mar., 1901, Shop Foreman, Winnipeg roundhouse; Mar., 1901, to July, 1902, Erecting Shop Foreman, Winnipeg repair shop; July, 1902, to Jan., 1903, General Foreman, Calgary, Alta.; Jan., 1903, to Oct., 1906, Locomotive Foreman, Brandon, Man.; Oct., 1906, to Apr., 1909, District Master Mechanic, Moose Jaw, Sask.; Apr., 1909, to Mar., 1910, District Master Mechanic, Nelson, B.C.; Mar., 1910, to Jan., 1912, Master Mechanic, Alberta Division, Calgary.

J. G. Entwistle, who has been appointed acting Superintendent, District 2, Western Division, Canadian Northern Ry., Saskatoon, Sask., was born at Streetsville, Ont., Dec. 1, 1859, and entered railway service in 1877, in the maintenance of way department of the Credit Valley Ry., and subsequently spent six years in the C.P.R. Mechanical

Department in the west, returning to Toronto, where he had charge of the grading and tracklaying on the C.P.R. from the Union station to North Toronto, to 1889, when he was appointed Roadmaster, Erie and Huron Ry., remaining in that position to 1897, when he went to Winnipeg as locomotive driver, Northern Pacific Ry., and on the taking over of that line by the Canadian Northern Ry., transferred to the latter service, and in 1909 was appointed Road Foreman of Locomotives.

J. F. Chapman, who has been appointed Manager, Thousand Islands Ry., and Oshawa Ry., Deseronto, Ont., and whose portrait appears in this issue, was born at Frankford, Ont., Aug. 25, 1863. Having learned telegraphy, he was appointed first agent of the northern extension of the Central Ontario Ry. at Frankford, and as the line was opened up he was moved to other stations, being officially located at Coe Hill Mines, the northern terminus. On the closing down of the mines, he entered the Bay of Quinte Ry. service, being from June, 1886, to Aug., 1890, chief clerk to General Freight and Passenger Agent, Deseronto, Ont.; Aug., 1890, to Jan., 1895, Superintendent, Thousand Islands Ry., Gananoque, Ont.; Jan., 1895, to Jan., 1904, Assistant General Freight and Passenger Agent, Bay of Quinte Ry., Thousand Islands Ry., Oshawa Ry. and Deseronto Navigation Co., Deseronto, Ont.; Jan., 1904, to Jan., 1912, General Freight and Passenger Agent, same lines.

Capt. W. J. Press, whose portrait appears in this issue, was born at Melbourne, Australia, July 3, 1864, and served an apprenticeship of seven years with the South Australia Government Railways, remaining in that service from 1880 until 1899. On the outbreak of the South African war he went to South Africa attached to the Royal Engineers, graded as staff captain. He was appointed Principal Works Manager of the Imperial Military Railways on Aug. 8, 1900, and resigned Jan. 20, 1904, when he came to Canada to gain experience. He was appointed Inspector of Improved Methods of C.P.R. Angus shops, June, 1905, and resigned the latter end of 1907 to take over the management of Mussens, Ltd., machinery department, Montreal. In May, 1910, he was appointed Mechanical Engineer and Machinery Expert, National Transcontinental Ry., since which time he has had complete control of all mechanical equipment along the line, together with the design and construction of locomotive, car and repair shops.

Dr. H. T. Bovey, F.R.S., one of the founders of the Canadian Society of Civil Engineers, died at Eastbourne, Eng., of Brights disease, Feb. 3. He was for many years resident in Canada, having been appointed Professor of Civil Engineering and Applied Mechanics at McGill University, Montreal, in 1887. At that time the engineering courses in the University were managed as a branch of the Faculty of Arts, and were without buildings or equipment. The following year, however, a department of applied science was constituted with Prof. Bovey as dean, and to his management and advice the science department owes its development. He was Secretary of the Canadian Society of Civil Engineers from 1887 to 1891; also Treasurer in 1887; councillor from 1892 to 1895; Vice President, 1896 and 1897, and President in 1900. He left Canada a few years ago to return to England, and was appointed Rector of the Imperial College of Science and Technology, which position he resigned early in 1910.

Frederick Passmore Gutelius, M.Can. Soc. C.E., who has been appointed one of the commissioners to investigate expenditures and other matters in connection with the construction of the National Transcontinental Ry., as intimated in our last issue, was born at Mifflinburg, Pa., Dec. 21, 1864, and graduated from Lafayette College as civil engineer in 1887. He entered railway service in 1888, since when he has been, to 1892, Assistant Engineer and Assistant Supervisor, Pennsylvania Rd., Pittsburgh, Pa.; 1885 to 1898, General Superintendent, Columbia and Western Ry.; 1898 to 1900, Superintendent, C.P.R., Nelson, B.C.; 1900 to 1902, in various positions in C.P.R. Engineering Department; 1902 to Mar., 1906, Engineer of Maintenance of Way, C.P.R., Montreal; Mar., 1906, to Sept. 15, 1908, Assistant Chief Engineer, Eastern Lines, C.P.R., Montreal; Sept. 15, 1908, to Dec. 30, 1910, General Superintendent, Lake Superior Division, C.P.R., North Bay, Ont.; Dec. 30, 1910, to Jan., 1912, General Superintendent, Eastern Division, C.P.R., Montreal.

W. E. Mullins, heretofore General Manager, Northern Ry. of Costa Rica, has been appointed General Manager, United Fruit Co. of Costa Rica, with jurisdiction over the banana farms, railways and all of the United Fruit Co.'s interests there, E. R. Hitchcock, heretofore

P257 D. L. Jones,
District Master Mechanic and Trainmaster, District 2, Atlantic Division, C.P.R.

Manager of the banana lands, having been assigned to other duties. Mr. Mullins was born at Stratford, Ont., Aug. 13, 1870, and entered railway service on the G.T.R., July, 1887, being employed in the freight and passenger departments until 1891, since when he has been, to 1893, in Assistant Mechanical Superintendent's office, London, Ont.; 1893 to 1897, in Assistant Superintendent's office, London, Ont.; 1897 to 1899, chief clerk to Superintendent, Middle Division, G.T.R., Toronto; 1899 to 1902, secretary to Vice President and General Manager, Central Vermont Ry., St. Albans, Vt.; 1902 to May, 1906, Superintendent of Transportation, Central Vermont Ry., St. Albans, Vt.; June, 1906, to Jan., 1912, General Manager, Costa Rica Ry., and Northern Ry. of Costa Rica.

James Oborne, who has been appointed General Superintendent, British Columbia Division, C.P.R., Vancouver, was born at Montreal, Sept. 19, 1861, and entered railway service in 1874, since when he has been, successively, two years and ten months office boy and chief clerk to Works Manager, G.T.R.; three years chief clerk to Mechanical Superintendent, C.P.R.; fifteen months chief clerk to Vice President, C.P.R., 1890 to Apr., 1896, Superintendent, Car Service, C.P.R., and from 1892 also in charge of the Fuel Department; Apr., 1896, to Apr., 1899, Assistant to President, C.P.R.; Apr., 1899, to May 1, 1901, General Superintendent, Western Division, C.P.R., Winnipeg; May, 1901, to Apr., 1903, General Superintendent, Atlantic Division, C.P.R., St. John, N.B.; Apr., 1903, to Nov., 1904, General Superintendent, Eastern Division, C.P.R., Montreal; Nov., 1904, to Jan., 1912, General Superintendent, Ontario Division, C.P.R., Toronto. This appointment practically completes Mr. Oborne's circuit of the whole C.P.R. system, as he has been General Superintendent of every division except the Lake Superior one.

W. F. Tye, who has been elected President of the Canadian Society of Civil Engineers, was born at Haysville, Ont., Mar. 5, 1861, and educated at Ottawa University, and the School of Practical Science, Toronto. He entered railway service in 1882, since when he has been, successively, rodman, leveller, transitman on location, and assistant engineer of construction, C.P.R.; 1886 to 1887, transitman and assistant engineer, St. Paul, Minneapolis and Manitoba Ry.; 1888, Engineer of Track and Bridges, Tampico Branch, Mexican Central Ry.; 1890, locating engineer, Great Falls and Canada Ry.; 1891 to 1892, engineer in charge of location, and Division Engineer, Great Northern Ry. Pacific extension; 1892 to 1894, engineer in charge of the change of gauge, Alberta Ry. and Coal Co.'s line; 1895 to 1896, Chief Engineer, Kaslo and Slocan Ry.; 1896 to 1900, Chief Engineer, Columbia and Western Ry.; 1900 to June, 1902, Chief Engineer of Construction, C.P.R.; June, 1902, to May, 1904, Assistant Chief Engineer, C.P.R.; May, 1904, to Feb., 1906, Chief Engineer, C.P.R., which position he resigned to take up private practice.

G. H. Davis, who has oeen appointed Assistant Engineer of Terminals, C.P.R., Toronto, was born there, Feb. 28, 1881, and entered C.P.R. service, Nov. 14, 1905, since when he has been, to Aug., 1906, rodman on preliminary, location and survey work on the Georgian Bay and Seaboard Ry.; Aug., 1906, to Apr., 1907, rodman and assistant draughtsman, preliminary surveys on the line from Tweed to Toronto, via Belleville, Ont.; Apr., 1907, to Dec., 1909, draughtsman and assistant to the Assistant Engineer, on revision and construction of Georgian Bay and Seaboard Ry. from Port McNicoll to Coldwater Jct., Ont.; Dec., 1909, to Apr., 1910, draughtsman and instrumentman, Division Engineer's staff; Apr. to Oct., 1910, in charge of construction of Mimico cut-off and double track work from Lambton to mileage 10, London section, Ont.; Oct., 1910, to Feb. 1, 1912, assistant to Resident Engineer, Toronto.

H. H. Vaughan, who has been elected Vice President, Canadian Society of Civil Engineers, and whose portrait appears in this issue, was born at Forest Hill, Essex, Eng., Dec. 26, 1868, and educated at King's College, London, Eng. He served an apprenticeship with Nasmith, Wilson and Co., Patricroft, Manchester, Eng., going to the U.S. in 1891. He was engaged with various companies as machinist, draughtsman and assistant engineer of tests, and mechanical engineer, including the Great Northern Ry., Philadelphia and Reading Ry., and the Queen and Crescent Route, and after a period of service with a supply house, was appointed Assistant Superintendent of Motive Power, Lake Shore and Michigan Southern Ry., Mar., 1902, remaining until Feb., 1904, when he was appointed Superintendent of Motive Power, C.P.R.,

which position he held until his appointment as Assistant to the Vice President, C.P.R., Dec., 1906. He is President of the Engineers' Club of Montreal, and has been a member of the Canadian Society of Civil Engineers since 1906, and a member of the council since 1910.

J. T. Arundel, General Superintendent, Manitoba Division, C.P.R., was presented with a diamond ring, Feb. 15, by the operating department of the division, on his leaving Winnipeg to become General Superintendent of the Ontario Division, Toronto. A gold brooch was presented to Mrs. Arundel on the same day.

W. F. Buck, Superintendent of Motive Power, Atchison, Topeka and Santa Fe Ry., who died on a private car between Albuquerque and Los Angeles, Cal., Jan. 31, of pneumonia, entered railway service as a locomotive engineer on the Intercolonial Ry. His father was a civil engineer on the building of the line in the vicinity of Newcastle, N.B., where W. F. Buck was born.

H. E. Bissell, whose appointment as Right of Way and Claims Agent, Grand Trunk Pacific Ry., Winnipeg, was announced in our last issue, was born near Noyan, Que., Dec. 31, 1867, and entered railway service in Oct., 1887, since when he has been, to May, 1888, baggage master, freight house foreman and manifest clerk, G.T.R., and Delaware and Hudson Co., Rouses Point, N.Y.; May to Nov., 1888, Assistant Yardmaster, Central Vermont Ry. and Ogdensburg and Lake Champlain Rd., Rouses Point, N.Y.; Nov., 1888, to Dec., 1889, billing clerk, same roads, Rouses Point, N.Y.; Dec., 1889, to Nov., 1892, chief clerk and cashier, same roads, Rouses Point, N.Y.; Nov., 1892, to Apr., 1894, station agent, same roads, and Canada Atlantic Ry., Rouses Point, N.Y.; Apr., 1894, to May, 1900, in private business; June, 1900, to May, 1904, in General Auditor's office, Central Vermont Ry., St. Albans, Vt.; May, 1904, to Feb., 1907, chief clerk of general accounts, same road, St. Albans, Vt.; Feb., 1907, to Apr. 1, 1911, chief clerk to Chief Engineer, G.T.P.R., Montreal; Apr. 1, 1911, to Jan. 1, 1912, Assistant Right of Way and Claims Agent, G.T.P.R., Winnipeg.

Duncan MacPherson, M. Can. Soc. C.E., whose portrait appears on another page, was born at Bath, Ontario, in 1858, of U.E. Loyalist parentage. He was educated at Napanee High School and the Royal Military College, Kingston, from which latter he graduated in June, 1880, standing head of the class in civil engineering, taking honors in several other subjects, and winning the Marquis of Lorne's silver medal for general proficiency. This class was the original one of 18 entering at the inception of the College in 1876, and known ever since as the "Old Eighteen." In Nov., 1880, he was employed as rodman on surveys for the extension of the Canada Central Ry., which in 1881 was merged into the C.P.R. He remained on location and construction of C.P.R. for several years, in various capacities, until he was appointed resident engineer on maintenance of way and construction of branch lines, starting with a territory of about 400 miles. Was afterwards promoted to division engineer, and duties and responsibilities continually increased until he had charge of the whole Eastern Division, comprising 1,500 miles of main track. He resigned from the C.P.R. in 1905, after about 25 years service, on his appointment as Assistant Chief Engineer of the National Transcontinental Railway, remaining in that position till Dec., 1911, when was promoted to be Assistant to the Chairman. He holds certificates of Dominion Land Surveyor and Ontario Land Surveyor, is a life member of English Institution of Civil Engineers, charter member of Canadian Society of Civil Engineers and of the American Railway Engineering Association, past Vice President, Canadian Society of Civil Engineers, and now a councillor of same, having been elected to that office for the 14th time, which is oftener than any other member of the society has been so elected. He is the inventor of the MacPherson safety switch and frog, which gives a solid continuous main line, and is in use in Canada and the United States.

The Railway to Hudson Bay.

The contractors for the grading of the first section of the Dominion Government railway from Pas Mission to near Split Lake, 185 miles, J. D. McArthur and Co., Winnipeg, are reported to have sublet the work to McMillan Bros., Winnipeg. This latter firm of contractors began Feb. 7, taking in supplies and plant. A. McMillan, in an interview, is reported to have said the work of getting in supplies and plant will be interfered with owing to the lateness of the season, and the congestion of traffic on the railways, but it is expected to get in sufficient to keep 600 men at work. Camps will be built every ten miles, and the work pushed as fast as possible. The route to be traversed by the line is interspersed with muskegs, and high ridges, with numerous lakes and water courses, but there is very little rock. A good deal of the work will be "wheelbarrow work," the nature of the ground preventing the use of horses and scrapers, so that progress will not be so fast as on the prairies. Horses and scrapers will be used where possible.

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Rene Dupont,
Traffic Manager, Canada and Gulf Terminal Railway.

J. P. Gordon, who has been on location work for the past two years, has been appointed Assistant Chief Engineer.

We are officially advised that the matter of awarding contracts for track materials for the line is still in abeyance.

The Naval Department's Hydrographic Branch is said to be preparing a chart showing the results of the most recent surveys made at the mouth of the Nelson River. The chart will, it is said, show a wide channel from 20 to 60 ft. deep, with few shoals, to the point in the river where terminals have been provisionally located, and will demonstrate that with a protection wall for the roadstead, Port Nelson would be a suitable terminus for the line. However, the question of the navigation of the bay and straits is of importance, and a further survey, in charge of Captains Bernier and Bartlett, is to be made during this year. A further examination will also be made of the land terminals at Port Nelson and Fort Churchill, and engineers were expected to be sent from Ottawa for this purpose by Mar. 1.

London, Eng., press dispatches, Feb. 15, stated that a contract had been let to Pethick Bros., Plymouth, Eng., for the building of docks and grain elevators at Fort Churchill, at a cost of about $17,500,000. Ottawa officials state that tenders have not been asked for any such work, and that nothing will be done in that direction until the question of whether Port Nelson or Fort Churchill is to be the terminus has been settled. The story probably originated in the fact that an English company is endeavoring to finance the building of a railway from Fort Churchill to Prince Albert and Edmonton, and Pethick Bros. have been associated with some of the people behind that project in contracts in England and elsewhere. (Feb., pg. 79.)

Railway Route Plans Approved.

The following route plans have been approved by the Minister of Railways in addition to those mentioned on pg. 62:—

CANADIAN NORTHERN ONTARIO RY.—Dec. 22, 1911. From Chisholm tp., Nipissing district, on the Montreal-Georgian Bay line, to Capreol tp., Sudbury district, on the Toronto-Sudbury line, about 100 miles.

Feb. 13. Revision of North Bay-Capreol route, about 18 miles.

CANADIAN NORTHERN RY.—Dec. 22, 1911. Strathcona-Calgary line. Revision from Strathcona, via Lacombe, to just south of Red Deer, about 95 miles.

Feb. 9. From near Portage la Prairie southeasterly through Morris to near Stuartburn, 90 miles.

Feb. 9. Chamberlain to MacRorie, Sask., about 75 miles.

Feb. 9. From tp. 26, r. 8, w. 3rd m. to tp. 28, r. 1, w. 4th mer., part of Regina-Red Deer route, about 138 miles.

Feb. 9. From tp. 28, r. 29, w. 3rd mer. to Camrose, about 165 miles.

Jan. 13. Strathcona-Calgary line. Revision from just south of Red Deer to east side of Bow River near Calgary, about 95 miles.

CANADIAN PACIFIC RY.—Feb. 9. Revision of former approval from Lake Johnston to the Weyburn-Lethbridge branch, 30 miles.

GRAND TRUNK PACIFIC BRANCH LINES CO.—Jan. 13. Biggar-Calgary branch, from 4th meridian to tp. 32, range 18, west 4th meridian, about 105 miles.

Jan. 13. Cutknife branch. Revision from tp. 43, range 21, to tp. 44, range 25, west 3rd meridian, about 24 miles.

Jan. 13. From Cedoux southerly and easterly to International boundary in tp. 1, range 11, west 2nd meridian, about 70 miles.

HA HA BAY RY.—Jan. 13. From near St. Dominique village to Government wharf at Bagotville, with branches to St. Alexis, Lake Kenogami and Chicoutimi, Que., about 36 miles.

ST. JOHN AND QUEBEC RY.—Jan. 17. From Rothesay, on the Intercolonial Ry., along the St. John River, to Andover, about 160 miles.

Temiskaming and Northern Ontario Ry.—Revenue for Nov., 1911, $169,482.55; expenditure, $113,986.57; net revenue, $55,495.98; less hire of equipment, etc., $3,038.61, and outside operations, $304.71; net result, $52,152.66.

Canadian Pacific Railway Construction, Betterments, Etc.

The C.P.R. is applying to the Dominionion Parliament for authority to expropriate any easement, right of way, or other privileges enjoyed in, to, or over, or in respect of any lands required for the purpose of its railway or any railway controlled or operated by it.

St. John Freight Sheds.—The new freight sheds and warehouses at St. John, N.B., are reported to have been completed. Up to the present the C.P.R. has made an extensive use of the Intercolonial Ry. freight sheds.

Terminal Points on Atlantic Division.—With respect to the reported probable removal of the terminals from Megantic, Que., to Lowelltown or some other point nearer the International boundary, we are officially advised that while the question of the relocation of divisional points on the Atlantic Division has been talked of, nothing definite has been arranged.

Windsor St. Station, Montreal.—Application is being made by the C.P.R. exercising the rights and franchises of the Ontario and Quebec Ry. to the Board of Railway Commissioners, for the right to take additional lands for the purpose of securing the efficient operation of its lines in connection with the enlargement of the Windsor St. terminals, Montreal.

The outer stone work at the new section of the station is reported completed, and the interior work is being pushed ahead as fast as possible. The work of joining up the new building with the old has yet to be done. It is proposed to move the main entrance to the building from its present position on Osborne St. right on to the corner of Windsor and Osborne Streets. There will be two other entrances to the block, one at the foot of the tower and a second at the corner of Windsor St. and St. Antoine St. Nothing definite has been announced as to the train shed which is to be built over the new tracks which are to be laid.

Proposed Tunnel at Ottawa.—D. McNicoll, Vice President, is reported as having said. Feb. 8. that the company is prepared to build a tunnel under the city of Ottawa as soon as the Government gives the necessary permission. An Ottawa dispatch. Feb. 15, states that the matter will be dealt with by the Government at an early date, and that the engineers to whom the plans were referred report favorably. The cost of the work is stated to be about $3,000,000.

At a hearing before the Board of Railway Commissioners at Ottawa, Feb. 6, it was settled that the basis on which the C.P.R. shall pay the G.T.R. for the use of the Central Station shall be the rental value, not the cost, and evidence will be heard. Mar. 5, as to this point.

Georgian Bay and Seaboard Ry.—Local press reports state that C.P.R. engineers are making surveys for a line from Bethany Jct. through Bethany and Millbrook to the proposed line of the Campbellford, Lake Ontario and Western Ry., in the vicinity of Cobourg or Colborne, Ont. G. H. Garden is in charge.

Grain Elevator at Port McNicoll.—We are advised that a contract has been let to the John S. Metcalf Co., Montreal. for building a reinforced concrete addition to the elevator at Port McNicoll, Ont. The capacity of the additional storage will be 2,000,000 bush., and the estimated cost, together with the additions to the wharf to enable the travelling marine towers to reach the new storage, is approximately $350,000. The original elevator, which has a capacity of 2,000,000 bush., with a working house. was built by the John S. Metcalf Co. about a year ago.

Government House Property, Toronto.—We are officially advised that the plans for the development of this property are still under consideration, and that until definite approval has been given nothing can be said as to the layout of the proposed new yards. Under the agreement the Crown gives up possession of the property June 1.

West Toronto Yards, Etc.—The steel work of the new bridge across the tracks at Weston road. West Toronto, is being erected. Several new tracks have been laid at this point. but the principal work in progress is the laying of the tracks in the addition to the yards near Lambton. The subways at Jane St. and Elizabeth St. are being completed, and a large number of tracks are being laid and will be connected up just as soon as the steel work at the subways has been completed.

Cooksville, Etc.—The Board of Railway Commissioners has approved of plans for a new station building at Cooksville. Ont.. and it is reported that the work will be started at once. The question of the building of a second track from near Islington through there to Streetsville and other points west has been under discussion for a long time. Several surveys have been made, not only for a second track, but for an entirely new track starting from east of Cooksville station, which would cut out some curvature and reduce the gradients. An engineering party has been going over a route from Cooksville, south of Dundas St., westerly.

Entrance to Stratford, Ont.—The Stratford city council has arranged to submit a bylaw to the taxpayers approving of what is known as the South River route for the company's projected line through the town.

Interchange Track at Goderich.—The Board of Railway Commissioners has directed the C.P.R. to provide an interchange track with the G.T.R. at Goderich, Ont., by June 15.

Collingwood Southern Ry.—We are officially advised that surveys are being made by C.P.R. engineers for a line from near Baxter, on the Toronto-Sudbury line, into Collingwood, Ont., but it is not known whether any construction will be done this season or not.

H. D. Lumsden, M. Can. Soc. C.E., was in Collingwood. Feb. 1 and Feb. 6, in consultation with the town council and the Board of Trade in regard to the projected line. It is proposed to place the passenger station and freight yards on Maple St., and to build a wharf extending out from between Maple and Birch Streets. Mr. Lumsden is reported to have told the committee, Feb. 6, that if all the arrangements could be completed it was expected that construction would be started on May 1.

North Bay Yards, Shops, Etc.—Application is being made to the Ontario Crown Lands Department for a grant of water lots on Lake Nipissing, fronting the company's property at North Bay, Ont., for 3,000 ft. and extending 900 ft. into the Lake. It is proposed to fill in these lots and utilize the area for new repair shops, extensions to the existing works. and additions to the yards. General plans have been submitted to the town council for a six track repair shop to cost about $250,000. These have been approved, and the council has also consented to the water lots being transferred to the company.

Romford Jct. to Crete, Ont.—The Board of Railway Commissioners has authorized the opening for traffic of the second track from Romford Jct. to Crete, Ont.. on the Cartier subdivision.

Fort William Tracks, Etc.—The Board of Railway Commissioners has authorized the company to build a second main line track across McTavish St., and a double track across Pacific Ave., Fort William, Ont. A contract is reported to have been let to the Canada Foundry Co., Toronto. for the building of a double deck lifting bridge across the Mission River at Fort William.

Winnipeg Freight Yards, Etc.—In order to relieve the congestion in the freight yards at Winnipeg, two plans are under consideration. The first is the remodelling of the present yards and the provision of an additional yard east or west of the city, and the second is the building of a cut-off from East Selkirk to Reaburn. on what was the original survey for the line before it was determined to pass through Winnipeg. If this plan is adopted a sorting yard will have to be provided either at Reaburn or in its vicinity. Plans are being made for this work, but are not yet complete, and in fact it has not been decided what will be done. The accommodation which has to be provided in the yard wherever it is located will be for not less than 5,000 cars, and the question of $1,000,000 more or less in the cost of carrying out the plans, whatever may be decided upon, scarcely enters into the question. These are the principal statements reported to have been made by George Bury, V.P. and G.M.. in reply to a deputation from Selkirk and Stonewall citizens, which waited on him in connection with the newspaper reports as to the route of the projected Selkirk-Reaburn line. which stories. Mr. Bury said, "are absolutely without foundation or authority."

Red River Bridge.—Tenders are under consideration for the building of piers for a new bridge over the Red River, south of the Louise Bridge, Winnipeg. The new bridge is to be built in connection with the proposal to facilitate traffic to and from the station and yards.

Minnedosa.—A local press report states that a new bridge is to be built across the Little Saskatchewan river at Minnedosa, Man., to carry a second track. and that additions are to be made during the current year to the roundhouse and workshops.

Saskatchewan Buildings. — Tenders were received to Feb. 20 for the erection of the following buildings in the division:—Express building, outward freight shed, and extension to receiving freight shed at Saskatoon; express building, extension to freight shed, six-stall extension to engine house at Swift Current; six-stall addition to engine house at Regina; six-stall new engine house at Wilkie; standard no. 1 brick house, and six-stall engine and boiler house at Outlook; rooming house for dining car department at Moose Jaw; class A2 station buildings at Griffin, Springside. Drake and Dysart.

Weyburn-Lethbridge Line.—The Saskatchewan Minister of Railways informed the Legislature. Feb. 1, that he had been advised by the President of the C.P.R. that this line would be built to 175 miles west of Weyburn, Sask., during this year. and that a further 100 miles would be built in 1913 According to a statement credited to George Bury, V.P. and G.M., the starting point for construction this year will be at Viceroy, Sask.. and 100 miles will be graded. The construction programme also includes about 25 miles in Alberta, which will be at the Lethbridge end.

Asquith to Battleford, Sask.—We are officially advised that nothing definite has been arranged in regard to the reported early building of a branch from Asquith to Battleford, Sask. It was reported that the building of this line would have been included in the construction programme for the current year, but it was held over.

Moose Jaw Southwesterly.—The Board

of Railway Commissioners has authorized the opening for traffic of the branch from Moose Jaw southwesterly for 27.4 miles.

Swift Current Branches, Etc.—The Board of Railway Commissioners has authorized the opening for traffic of the branch from Swift Current southeasterly to Neville, 27.4 miles. The work outlined for the current year includes the grading of a further distance of 85 miles on the line started last year northwesterly from Swift Current, and additions to the terminal facilities at Swift Current.

Bridge at Medicine Hat.—We are officially advised that nothing has been finally decided as to the enlargement of the bridge over the Saskatchewan River at Medicine Hat, Sask. The plans are being prepared for the work, but have not yet been completed and approved.

Alberta Division Buildings.—Tenders have been received for the concrete substructure, excavation, etc., for overhead bridges and subway at Edmonton; for the erection of Western lines class A station buildings, at Webb, Namaka, Seven Persons, Winnifred, Dunmore, Clive, Nevis, Lougheed, Aldersyde, Jaffray, Burmis and Galloway, and a Western Lines standard no. 5 station at Yahk; and for an office building in Edmonton six stories and basement, of steel construction, faced with brick and stone, with tile partitions and arches.

Lethbridge to Coaldale.—Local press reports state that surveys have been completed for changing the location of the line between Lethbridge and Coledale, Alta., to reduce the heavy gradient, and that the new route will give a line about 20 ft. lower than the present one, but as it passes through Henderson Park the citizens are opposing it.

Calgary Shops.—W. L. Murray, of Westinghouse, Church, Kerr Co., general contractors, in an interview Feb. 1, is reported to have stated that construction would be started at the earliest possible moment, and that it was expected to get most of the work done by the end of the year. A U.S. paper recently stated that a contract has been placed there for 3,500 tons of the structural steel required, but George Bury subsequently stated that the order had been placed with a Canadian firm. The construction will be in general charge of T. H. Gilmore, Railway Shop and Equipment Engineer for Westinghouse, Church, Kerr and Co., and F. E. Caldwell, of the same company, will be the superintendent in charge.

Alberta Central Ry.—We are officially advised that the C.P.R. has acquired control of this company's charter. The company originally had power to build a line from Red Deer into the Brazeau coal fields, and subsequently obtained power to extend it through the Peace River district and the Pine River Pass to the Pacific coast, and easterly from Red Deer to Moose Jaw. The company has done some grading westerly from Red Deer, and has laid seven miles of track.

In the course of the discussion on the railway bills in the Alberta Legislature recently the Premier said he had an interview with C.P.R. officials following a letter from George Bury, Vice President, on the subject of building lines in the province. The C.P.R., it was stated, was desirous of building lines without Government aid, and wished for information as to the Government plans in order that there might be no duplication of lines, and that the settled parts of the province might be more quickly given railway facilities. The interview was a satisfactory one. (Feb., pg. 67.)

Kootenay Central Ry.—H. G. Parson, M.P.P., in an interview Feb. 7, said he had been informed by J. S. Dennis, Assistant to the President, that the C.P.R. expected that track would be laid on the K.C.R. from Golden to Spallumcheen, within four or five months.

Second Track Work in British Columbia.—The construction programme for the year covers the building of a second track from Hammond to Vancouver, 24.1 miles. Press reports stated recently that the section from Hope to Spence's Bridge, 88.9 miles, would also be double tracked, but we are officially advised it is not included in the work for which appropriations had been made for this year.

Coquitlam Yards.—The first part of the plans for the extensive yards to be located at this point will be placed under contract at an early date. A considerable sum having been provided in the appropriations for this year. The work proposed to be done this year includes, it is stated, two subways at the eastern end of the property on the Dewdney trunk road under an agreement with the municipality; the laying of 25 miles of track for yard purposes; a 12-stall roundhouse, and a coaling plant; water service. The tracks will be laid so as to form the nucleus of the complete yards.

New Westminster Wharf.—Tenders were received to Feb. 20 for the building of a wharf at New Westminster, B.C., parallel to that of the British Columbia Electric Ry. The wharf will run out to deep water.

Railway to the North Shore.—The British Columbia Minister of Railways had before him Feb. 9 the plan proposed by the C.P.R. for a line along the north shore of Burrard Inlet. The North Vancouver city and municipal authorities, and the Vancouver, Westminster and Yukon Ry., and the Burrard Inlet Tunnel and Bridge Co., which are jointly interested in a railway and bridge project along practically the same route, appeared to protect their interests. The C.P.R. made its application for the approval of its plans under its general powers as to branch lines. After hearing all the parties the Minister intimated that the company's plans would be approved with the proviso that the rights of the municipalities along the waterfront would be protected, and that the company first building would give the other companies running rights. (Feb., pg. 72.)

Toronto Union Station Plans.

The question of the plans for the proposed new union station in Toronto came before the Board of Railway Commissioners in Toronto Feb. 10. When the matter was previously before the commission the C.P.R. was directed to submit plans which would be satisfactory to it. This was submitted, Feb. 10, but proved unacceptable to the G.T.R. The Board favors the G.T.R. plans for the station building, and decided that York St. be kept open. The Chief Commissioner stated that there were some matters which the commission desired to discuss with its engineering and operating officers, and upon these being decided the necessary orders would be made as speedily as possible. J. W. Leonard, Assistant to the Vice President, C.P.R., was subsequently reported as stating that that company could not work under the G.T.R. plans and sooner than do it would erect a separate station.

G. Ruel, Chief Solicitor, Canadian Northern Ry., was reported on Feb. 22 as having stated that the C.N.R. and the C.P.R. would build a union station at North Toronto, at the southeast corner of the junction of the present C.P.R. tracks and Yonge St.

The Grand Trunk Pacific Ry., during Dec., 1911, patented land grants amounting to 140.84 acres.

British Columbia's Railway Construction Policy.

The Premier of British Columbia made a statement in the Legislature, Feb. 20, as to the railway legislation to be submitted for approval.

The Canadian Pacific Ry. is to be authorized to take over under a lease the Esquimalt and Nanaimo Ry., so that the line may be used as its Vancouver Island division, and will be aided in extending the line from Parksville to Comox. On the mainland an arrangement has been completed by which the Kaslo and Slocan Ry. will be taken over by the C.P.R., the rights of the Great Northern Ry. being acquired for $400,000. During the past year the line was operated for some miles by a local syndicate. The entire line is to be brought up to standard, and for this purpose the C.P.R. is to receive $100,000 as aid from the province.

The Kettle Valley Ry. is to be aided $10,000 a mile for the building of a line from Coldwater Jct. to Hope, 50 miles. The Vancouver, Victoria and Eastern Ry. is to be given running powers over this section of the line on terms to be arranged. Two hundred thousand dollars is also to be granted in aid of the building of a bridge across the Fraser River at Hope, for the purpose of connecting up this line with the C.P.R. This will give a short line between the Kootenay district and Vancouver over the C.P.R., and a route via the V.V. and E. Ry. This line will reach Vancouver from Hope over the Canadian Northern Pacific Ry., and its own line through New Westminster.

The Canadian Northern Pacific Ry. is to be aided in building a line from Kamloops via Grand Prairie and Vernon to Kelowna, with a branch to Lumley, a distance of 145 miles, and will also be given a grant of $35,000 a mile for a line from Campbell River to Hardy Bay on Vancouver Island, about 150 miles.

The Pacific and Great Eastern Ry. will be given a guarantee of bonds on the same basis as the guarantee to the Canadian Northern Pacific Ry. for the building of its line on the mainland, for the building of a line from Fort George to North Vancouver, and on by way of the Second Narrows bridge into Vancouver and New Westminster. Provision is to be made for the operation of a car ferry service to Victoria. This is the first section of the projected line from Vancouver to the Peace River country. The contract for the building of this line, press reports state, has been arranged with Foley, Welch and Stewart.

Car Building at Port Arthur.—A tentative agreement was entered into Feb. 16 between the city of Port Arthur, Ont., and the promoters of a company for the location of a car building plant there. The city is asked to provide a site of 125 acres at Bare Point, upon which it is proposed to erect buildings and put in a plant at a cost of $1,350,000. The city is to guarantee the company bonds for $500,000. The bylaw confirming the agreement will be submitted to the taxpayers at an early date. This project, press reports state, is independent of the proposition that the Canadian Car and Foundry Co. locate a branch plant in Port Arthur.

The Canadian Forestry Convention, which met at Ottawa in February, discussed the attitude of railways to forest fires, the discussion being led by E. A. Stirling, Forester, Pennsylvania Rd.

F. Atherton, purser on the C.P.R. s.s. Empress of Britain, was charged in London, Eng., Feb. 20th, with defrauding the C.P.R. and the Dominion Express Co. of some $15,000.

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Established 1898.

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NOTICE TO ADVERTISERS

ADVERTISING RATES furnished on application.

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TORONTO, CANADA, MARCH, 1912.

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Douglas Fir for Car Building.

In a bulletin on "Wood-using Industries, 1910," issued recently by the Interior Department's Forestry Branch, a comparison of the mechanical and physical properties of Douglas fir and yellow pine is given, which, it is claimed, shows "that, in addition to the physical qualities which render Douglas fir as easily worked, as readily polished, and as suitable for finish as yellow pine, Douglas fir possesses the mechanical qualities which render yellow pine adaptable for car building and for use in situations where durability, strength and resistance to compression are required."

It is also stated that "Douglas fir is a splendid wood for car building, the use for which the greater part of the 21,000,000 ft. of yellow pine was imported in 1910. It is strong, hard, stiff, large and clear enough for car frames, is suitable for car sidings and ceilings, and is beautiful enough for the interior finish of passenger cars. It has been used for the interior finish of private cars in the U.S."

We submitted the above to the principal Canadiaan car building companies and asked for opinions. The following replies have been received:

Canadian Car and Foundry Co., L'd.

N. CURRY, President, writes: "Most of the railways prefer Douglas fir for passenger car sills, chiefly on account of its straight grain and freedom from knots and cross grained wood, and most of them will permit the use of Douglas fir for box car framing instead of southern pine, but the rail freight makes this wood considerably higher for this purpose than the southern wood. We have been using large quantities of Douglas fir for carbuilding and other purposes for 25 years, and it has always given good results. There will never be any trouble about the Douglas fir competing with the southern wood at the same prices; in fact, in many cases we pay from $1 to $4 per thousand feet more for the Douglas fir than for the southern wood."

Preston Car and Coach Co., Ltd.

D. M. CAMPBELL, General Manager, writes: "Douglas fir is used by us instead of yellow pine quite freely. The only reason that we do not use more of it, is because we can get yellow pine cheaper than we can get Douglas fir, on account of the long haul. But with all deference to the opinion of other experts, we consider that yellow pine is fully as durable as Douglas fir."

R. W. Burnett, General Master Car Builder, C.P.R., writes:—"We have used considerable Douglass fir and with very good results."

Extensions to Canadian Pacific Railway Hotel System.

Extensive additions, etc., are to be made to a number of the C.P.R. hotels this year, involving the expenditure of several millions of dollars. The company's hotel system, which was commenced in 1886 by the erection of mountain chalets at Field, Glacier and North Bend. B.C., has been extended as the demands of travel required until now the company is the largest hotel proprietor in Canada and one of the largest in the world.

The Banff Springs Hotel at Banff, Alta., was started in 1887 and has been repeatedly added to. This year a fireproof wing, a swimming pool, bath houses, etc., will be built at an approximate cost of $500,000.

The Hotel Vancouver, at Vancouver, B.C., was the third of the series to be built. The several additions which have been made having proved inadequate for the demands, very extensive alterations, amounting to a rebuilding of the old part, including new public rooms, are to be carried out, which will place the hotel in the front rank of the system.

The chalet at Lake Louise, near Laggan, Alta., was only a log cabin when originally built in 1890. In 1892 it was burnt down and in 1893 a small frame structure, to accommodate a dozen guests, was built. At present there are 165 rooms. A fireproof wing is to be added with 100 rooms, and three large cottages containing 100 rooms in all, which will bring the total room accommodation up to 365. The approximate cost is $500.000.

The Chateau Frontenac, Quebec, built in 1892, has already been twice added to. A scheme is in hand which, when approved and carried out, will almost double the capacity.

The Place Viger, Montreal, built in 1898, has recently had an addition completed and another addition is planned.

The Royal Alexandra, Winnipeg, built in 1906, is already too small and an addition is contemplated.

The Empress, Victoria, B.C., built in 1907, is being added to for the second time, the new wing containing large general rooms and 80 bedrooms.

The Algonquin, St. Andrews, N.B., built in 1905, was largely added to in 1910. A large wing is being added to provide enlarged kitchen accommodation and additional bedrooms.

The smaller hotels at McAdam, N.B., Field, Glacier, Sicamous and Revelstoke, B.C., have all been largely added to since they were first built.

At Calgary, B.C., construction has started on an hotel which will cost over $1,000,000.

The company's hotels, with their present capacity, can accommodate 4,500 guests. The present dining room capacity is 3.247, which gives but a slight idea of the service rendered. The number of meals served last year was approximately 2,871,922.

Railway and Allied Associations, Clubs, Etc.

The names of persons given below are those of the secretaries.

CANADIAN CAR SERVICE BUREAU, J. E. Duval, 401 St. Nicholas Building, Montreal.

CANADIAN FREIGHT ASSOCIATION, T Marshall, Union Station, Toronto.

CANADIAN FREIGHT ASSOCIATION, (Western Lines), W. E. Campbell, 502 Canada Building, Winnipeg.

CANADIAN RAILWAY CLUB, J. Powell, St. Lambert, Que. Meetings at Montreal 2nd Tuesday each month, 8.30 p.m., except June, July and August.

CANADIAN SOCIETY OF CIVIL ENGINEERS, C. H. McLeod, 413 Dorchester St., west, Montreal.

CANADIAN STREET RAILWAY ASSOCIATION, Acton Burrows, 70 Bond Street, Toronto.

CANADIAN TICKET AGENTS' ASSOCIATION, E. de la Hooke, London, Ont.

CENTRAL RAILWAY AND ENGINEERING Club of Canada, C. L. Worth, 409 Union Station, Toronto. Meetings at Toronto 3rd Tuesday each month, except June, July and August.

EASTERN CANADIAN PASSENGER Association, G. H. Webster, 54 Beaver Hall Hill, Montreal.

ENGINEERS' CLUB OF MONTREAL, R. W. H. Smith, 9 Beaver Hall Square, Montreal.

ENGINEERS' CLUB OF TORONTO, R. B. Wolsey, 94 King St. west, Toronto.

QUEBEC TRANSPORTATION CLUB, J. S. Blanchet, Quebec.

WESTERN CANADA RAILWAY CLUB, W. H. Rosevear, 25½ Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.

Canadian Northern Railway Earnings, Expenses, Etc.

Gross earnings, working expenses, net profits, increases or decreases, compared with those for 1910-11, from July 1, 1911:—

	Earnings.	Expenses.	Net Earnings.	Net Increase
July	$1,475,900	$1,114,300	$361,600	$13,400
Aug.	1,420,600	1,105,900	314,700	51,700
Sept.	1,576,400	1,157,000	419,400	38,200
Oct	2,028,900	1,348,500	680,400	99,900
Nov.	2,001,500	1,336,300	665,200	106.300
Dec.	1,831,400	1,327,600	503,800	144,600
	$10,344,700	$7,389,600	$2,945,100	$154,100
Inc.	$ 2,288,100	$1,834,000	$ 454,100	.....

Approximate earnings for Jan., $1,228,100, against $822,600 for Jan., 1911.

Canadian Pacific Railway Earnings, Expenses, Etc.

Gross earnings, working expenses, net profits, increases or decreases, compared with those for 1910-11, from July 1, 1911:

	Earnings.	Expenses.	Net Profits.	Net Increases.
July	$ 9,661,818.14	$5,958,789.81	$3,703,028.33	$218,408.74
Aug.	10,421,904.42	6,346,333.41	4,075,571 01	383,898.68
Sept.	10,049,084.97	6,131,638.17	3,917,446.80	5,847.16
Oct.	11,207,991.99	6,526,887.24	4,631,104.75	175,944.23
Nov.	10.570,694.80	6,583,328.31	3,987,366.46	250,244.23
Dec.	10,654,871.67	6,549,141.41	4,105,730 26	819,196.37
	$62,566,365.99	$38,096,118.35	$24,470,247.64	$1,853,539.41
Inc.	6,778,713.35	$ 4,925.173 94	$ 1,853,539.41	.....

Approximate earnings for Jan., $7,201,000, against $5,650,000 for Jan., 1911.

Grand Trunk Railway Earnings, Expenses, Etc.

Subjject to audit, the accounts for the half-year to Dec. 31, 1911, show the following results:—

Gross receipts		£4,135,800
Working expenses		3,110,900
Net receipts		£1,024,900
Income from rentals, outside operations, and car mileage balances		11,700
Total net revenue		£1,036,600
Net revenue charges for the half-year, less credits		530,800
Balance		£ 505,800
Deduct, Canada Atlantic Ry. deficiency for the half year	£32,300	
Detroit, Grand Haven and Milwaukee deficiency for the half year	6,600	
		38,900
Surplus		£ 466,900

This surplus of £466,900 added to the balance of £11,600 from June, 1911, makes a total of £478,500 available for dividend, which will admit of the payment of the dividend for the half year on the 4% guaranteed stock, and first and second preference stocks, and a dividend of 1½% for the year on the third preference stock, leaving a balance of about £6,800 to be carried forward.

The accounts of the Grand Trunk Western Ry. for the half year, after providing for the deficit of £31,461 at June 30, 1911, show a surplus of £12,500, which amount is carried forward to the current half year.

Approximate earnings for Jan., $3,422.296, against $3,381,239 for Jan., 1911.

CANADIAN PACIFIC RAILWAY

NOTICE.—The Canadian Pacific Railway Company will apply to the Parliament of Canada, at its present session, for an Act authorizing and empowering it to expropriate any easement, right of way or other privilege enjoyed in, to or over, or in respect of any lands and required for the purpose of its railways, or any railway controlled or operated by it, and for other purposes.

Dated at Montreal this 8th day of February, 1912.

WALTER R. BAKER,
Secretary.

Pringle, Thompson & Burgess,
Ottawa Agents.

Traffic Orders by the Board of Railway Commissioners.

The dates given for orders are those on which the hearings took place, and not those on which the orders were issued:—

Heated Cars for Mineral Waters, Etc.

15819. Jan. 18.—Re application of Sanitaris, Limited, Arnprior, Ont., for an order directing railway companies to furnish, during cold weather, heated cars for the carriage of mineral water, ginger ale, and other bottled beverages, in quantities aggregating not less than carload lots, from one shipper to one or more consignees and destinations. Upon the hearing of the application on Jan. 4 last, and hearing what was alleged on behalf of the railway companies and the applicant, and judgment being withheld for further information; and upon its now appearing that railway companies had in practice systems of carrying way freight in heated cars, and upon the complaint of the Sudbury Brewing and Malting Co. that such systems had been abandoned, and upon its appearing that

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H. H. Vaughan,
Vice President, Canadian Society of Civil Engineers.

at a meeting of the Canadian Freight Association, held on Nov. 23, 1911, as alleged in a circular sent to the Sudbury Brewing and Malting Company by the C.P.R. local freight agent at Sudbury, that it was resolved that shipments in less than carload lots in heated cars should be discontinued, and its appearing that no notice of the withdrawal of such privilege had been given to shippers, and such withdrawal has worked hardship, it is ordered that all railway companies subject to the Board's jurisdiction shall forthwith re-establish the system or system in practice by them of carrying less than carload lots in heated cars during the winter of 1910-1911, and shall forthwith grant to all shippers the rights and privileges of such shipping facilities in respect to such traffic as were in force upon their various lines during the said winter, until further order, or until the reasonableness of the withdrawal of such facilities can be passed upon by the Board.

Boston and Maine Rd. Tariffs.

15858. Feb. 1.—Re supplement no. 1 to Boston and Maine Rd. Joint and Proportional Class-rate and Commodity Tariff C.R.C. 1219: Whereas the said tariff was issued by the railroad company on May 24, 1911, to take effect on June 28, 1911, but was not filed with the Board until Jan. 4, 1912, and whereas, under the provisions of the Railway Act, any special tariff advancing the toll previously authorized to be charged shall be filed by the company with the Board at least 30 days previously to the date on which such tariff is intended to take effect, it is ordered that the said Supplement no. 1 be disallowed.

Freight Rates in British Columbia.

15961. Feb. 15.—The complaint of the Vancouver Board of Trade, alleging discrimination in freight rates by the railway companies operating in British Columbia having been fully heard and the Board having, during the progress and before the completion of that case, undertaken a general enquiry into freight rates in Alberta, Saskatchewan, Manitoba and Ontario west of Port Arthur, and it appearing that the questions arising in the Vancouver Board of Trade case are so intimately related with the rates now under enquiry in the other provinces above mentioned that this matter cannot be satisfactorily disposed of separately. It is ordered that the Province of British Columbia be added to those above mentioned and that the said general enquiry shall extend to and cover all the freight and passenger rates in that province; that all the evidence and exhibits as well as the argument shall form part of the record in said enquiry; that any interested party may supplement as he may desire to the said evidence and argument.

Joint Tariffs Less Than Local Rates.

At a meeting of the Board in Ottawa, April 16, railway companies under Dominion authority will be required to show cause why an order should not issue calling for the publication and filing of joint tariffs between points in Canada (where such have not already been published and filed) less than the combination of the local rates of the several companies to and from the junction point or points; also to state their views as to the extent to which the said local rates might be reduced on joint traffic.

Canadian Society of Civil Engineers' Officers.

Following are the officers for the current year, as changed by the elections at the annual meeting in Montreal recently:—

PRESIDENT—W. F. Tye, Toronto. VICE PRESIDENTS—H. Holgate, Montreal; J. G. Sullivan, Winnipeg; H. H. Vaughan, Montreal. TREASURER — E. Marceau, Montreal. SECRETARY—C. H. McLeod, Montreal. COUNCILLORS—P. S. Archibald, Moncton, N.B.; E. E. Brydone-Jack, Winnipeg; C. E. Cartwright, Vancouver; C. R. Coutlee, Ottawa; J. S. Dennis, Calgary; A. E. Doucet, Quebec; G. H. Duggan, Montreal; C. L. Fellowes, Toronto; H. E. T. Haultain, Toronto; L. A. Herdt, Montreal; J. A. Hesketh, Winnipeg; H. M. Jaquays, Montreal; P. Johnson, Montreal; J. C. Kennedy, Vancouver; J. G. LeGrand, Winnipeg; W. B. Mackenzie, Moncton, N.B.; D. MacPherson, Ottawa; C. N. Monsarrat, Montreal; R. McColl, Halifax; J. T. Morkill, Sherbrooke; P. E. Parent, Quebec; J. M. Shanly, Montreal; A. F. Stewart, Toronto; W. J. Stewart, Ottawa.

J. W. Harkom, M. Can. Soc. C.E., consulting engineer, Melbourne, Que., read a paper on "Locomotive boilers, their development and troubles; some reflections and suggestions," before the Canadian Railway Club in Montreal Feb. 13.

Railway Rolling Stock Notes.

Five of the locomotives which are being built by the Montreal Locomotive Works for the C.P.R. will be changed to burn oil fuel on the British Columbia Division after they have been delivered.

The 2,000 steel frame box cars, which the C.P.R. recently ordered in the U.S., as mentioned in a previous issue, will be C.P.R. standard. 80,000 lbs. capacity, 36 ft. long inside, with steel underframes and superstructures, etc.

The 200 stone cars, which the C.P.R. is having built at the Nova Scotia Car Works, Halifax, as mentioned in our last issue, will be of steel, 41 ft. long, with wooden sides, and of 80,000 lbs. capacity. They are to be practically standard steel underframe cars.

The three Lidgerwood flat cars which were built by the Canadian Car and Foundry Co., Montreal, for the Dominion Equipment and Supply Co., Winnipeg, as mentioned in our last issue, have been forwarded to Mackenzie, Mann and Co., Winnipeg.

The Central Vermont Ry. has purchased four Pacific type locomotives, from the Baldwin Locomotive Works, Philadelphia, Pa., three switching locomotives from the Lima Locomotive Co., Lima, O., and six passenger, one dining, two baggage and two parlor cars, from the American Car and Foundry Co., St. Charles, Mo.

The 90 tank cars, which the C.P.R. is having built in the U.S., mention of which has already been made, will have a capacity of 40 tons, and tank capacity of 8.393 imperial gallons, or 10,075 U.S. gallons. They will be equipped with steel under frames and friction draft gear, and fitted with safety valves and steam heating pipes to assist the loads to be discharged.

The Northern Construction Co. and Foley Bros. have ordered one special Rodger double plough distributing car, 30 tons capacity, from the Hart-Otis Car Co. It will be built by the Canadian Car and Foundry Co. Following are the principal dimensions:—

Length over end sills	32 ft.
Width over side sills	8 ft. 9 ins.
Height from rail to floor	4 ft. 1¼ ins.
Truck centres	23 ft. 8 ins.
Wheel base of truck	5 ft. 2 ins.

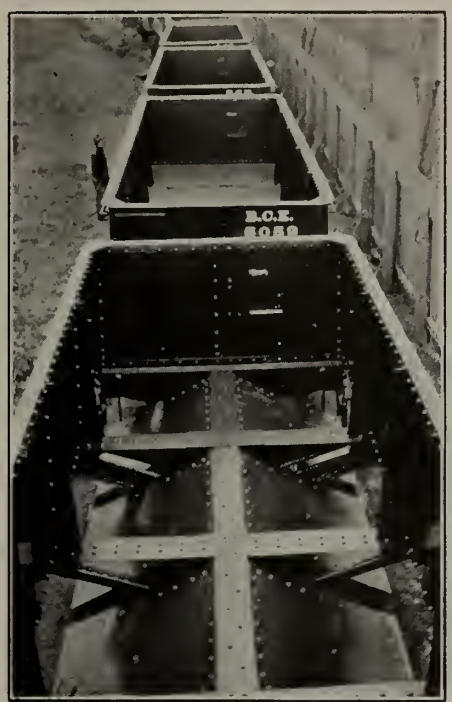
In our last issue in referring to the order given by the G.T.P.R. to the Canadian Locomotive Co., Kingston, Ont., for 15 consolidation locomotives with Schmidt superheaters, it was stated that it was in addition to the 25 already on order with the company. We are advised that the order is not an additional one, the order for 25, details of which we gave in our Jan. issue, has been reduced to 15, owing to the company not being able to make the delivery required.

The ten sleeping cars, which the C.P.R. is having built in the U.S., and which were mentioned in our Jan. issue, will be practically duplicates of the company's present type, and will be equipped with Tower couplers, Westinghouse air brakes L.N. 1612, cast steel body bolsters, Safety Car Heating and Lighting Co. lamps, Canadian Gold Car Heating and Lighting Co., hot water heating with Frumveller heater, with circulation controlled by C.P.R. standard heat controller.

The Quebec Central Ry. has ordered two mogul freight and two 10-wheel passenger locomotives from the Canadian Locomotive Co., Kingston, Ont. Following are the chief particulars:—

	Mogul.	10 Wheel.
Weight in working order	144,000 lbs.	155,000 lbs.
Weight on drivers	122,000 lbs.	123,000 lbs.
Cylinders, diameter and stroke	20 by 26 ins.	20 by 26 ins.
Driving wheels, diar.	57 ins.	63 ins.
Driving journals	8½ by 12 ins.	9 by 12 ins.
Boiler pressure	200 lbs.	200 lbs.
Tender, weight	104,000 lbs.	114,000 lbs.
Brake equipment	Westingbouse E.T. 6	

The Winnipeg board of control has under consideration tenders for the supply and delivery in that city a 44 or 45 ton steam shovel, equipped with a dipper of at least 1¼ yard capacity, and having a clear lift from rail to bottom of dipper door when open of not less than 16 ft. The city is also considering tenders for a standard gauge locomotive having a haulage capacity of at least 350 tons on a 1% gradient, and equipped both back and front with attachment for coupling to standard 80,000 lb. capacity freight cars.



Hart-Otis Dump Cars for British Columbia Electric Ry.

The illustrations on this page show Hart-Otis dump cars, of which the British Columbia Electric Ry. ordered 16, of 60,000 lbs. capacity, from the Hart-Otis Car Co., Ltd., Montreal, which have been built by the Canadian Car and Foundry Co. Following are the principal dimensions: Length inside, 25 ft.; length over buffers, 28 ft. 2½ ins.; width inside, 7½ ft.; width over all, 8 ft., height inside, 4 ft.; height over all, 8 ft. 4½ ins.; doors on each side, 5; angle of door opening 30 degrees. They are equipped with Simplex bolsters and brake beams.

Following are chief details of the 410 Otis semi-composite general service cars, which the C.P.R. is having built by the Canadian Car and Foundry Co., under license from the Hart-Otis Car Co:—

Length over end sills	38 ft. 9 ins.
Length inside	36 ft. 5 ins.
Width over all	9 ft. 11¼ ins.
Width inside	9 ft. 7 ins.
Height inside	5 ft.
Height from rail to top	9 ft. 4¾ ins.
Height from rail to floor	4 ft. 4¾ ins.
Truck centres	26 ft.
Wheel base of truck	5 ft. 6 ins.
Number of doors on each side	6
Width of door opening	2 ft. 2 ins.
Length of door opening	36 ft. 5 ins.

The Canadian Car and Foundry Co., between Jan. 15 and Feb. 15, made the following deliveries—24 Otis all steel cars to the Algoma Steel Co.; three first class cars, one sleeper, 221 ballast cars, 242 box cars, 382 steel under frame flat cars and one snow plough to the Canadian Northern Ry.; 13 steel under frame flat cars to the Canadian Pacific Ry.; one first class car, 143 steel frame box cars and 20 steel under frame flat cars to the Intercolonial Ry.; three tourist cars to the Grand Trunk Pacific Ry.; 31 steel frame box cars to the Grand Trunk Ry.; and four pay-as-you-enter composite street cars to the Montreal Tramways Co.

The Canadian Northern Ry., between Jan. 15 and Feb. 15, received the following additions to rolling stock—355 flat cars, four first class cars, one snow plough and 230 box cars, from the Canadian Car and Foundry Co., Montreal; one rotary snow plough from the Montreal Locomotive Works; 10 switching locomotives from the Canadian Locomotive Co., Kingston, Ont.; six second class cars and 30 box cars from the Crossen Car Co., Cobourg, Ont.; 188 Hart cars from the Hart-Otis Car Co., Montreal; one consolidation locomotive from the Canada Foundry Co., Toronto, and 110 box cars from the Nova Scotia Car Works, Halifax, N.S.

Following are chief details of the two G2 locomotives which the C.P.R. is building at its Angus shops, Montreal, as mentioned in our last issue:—

Weight on drivers	142,000 lbs.
Weight of engine	224,000 lbs.
Heating surface, tubes	2,730 sq. ft.
Heating surface, firebox	175 sq. ft.
Heating surface, total	2,905 sq. ft.
Superheater heating surface	539 sq. ft.
Grate area	45.6 sq. ft.
Cylinders, diar. and stroke	22½ by 28 ins.
Driving wheels, diar.	69 ins.
Brake equipment	Westinghouse ET 6

Hart-Otis Dump Cars for British Columbia Electric Ry.

Lubricator	Detroit 22
Valve gear	Walschaert
Superheater	Vaughan and Horsey
Boiler pressure	200 lbs.
Tender, weight loaded	140,000 lbs.
Capacity, water	5,000 imp. gals.
Capacity, coal	12 tons

O'Brien. McDougall and O'Gorman have ordered 100 forty-ton Hart convertible ballast and construction cars, 1912 design, from the Hart-Otis Car Co. These will be built by the Canadian Car and Foundry Co. Following are the principal dimensions:—

Length over end sills	36 ft. 8 ins.
Width over side sills	8 ft. 10 ins.
Length inside as hopper	20 ft. 10 ins.
Length inside as gondola	34 ft. 8 ins.
Width inside	8 ft. 8 ins.
Width over all	10 ft. 2½ ins.
Width at top	9 ft. 10 ins.
Height from rail to floor	4 ft. 4⅛ ins.
Height from rail to top	8 ft. 1⅜ ins.
Height inside	3 ft. 9¼ ins.
Truck centres	26 ft. 8 ins.
Wheel base of truck	5 ft. 4 ins.
Length of hopper door opening	16 ft. 8½ ins.
Width of hopper door opening	2 ft.

Following are the chief details of the 300 forty ton steel under frame Hart convertible cars, which the G.T.P.R. recently ordered from the Hart-Otis Car Co., Montreal, as announced in our last issue:—

Length between end sills	36 ft. 10 ins.
Width over side sills	8 ft. 9 ins.
Length inside as hopper car	22 ft. 4 ins.
Length inside as gondola car	34 ft. 8 ins.
Width inside	8 ft. 8 ins.
Width overall	10 ft. 2½ ins.
Width at top	9 ft. 10 ins.
Height from rail to top of floor	4 ft. 4¾ ins.
Height from rail to top of car	8 ft. 2 ins.
Height inside	3 ft. 9¼ ins.
Truck centres	27 ft. 10 ins.
Wheel base of truck	5 ft. 4 ins.
Total wheel base of car	33 ft. 2 ins.
Length of hopper door opening	17 ft. 8½ ins.
Width of hopper door opening	1 ft. 10 ins.

The C.P.R. stock cars, 308 of which are being built at its Angus shops, Montreal, as mentioned in our last issue, will have capacity for 60,000 lbs., and be 36 ft. long, 8 ft. 3¾ ins. wide by 7 ft. ⅝ in. high, inside measurements. They will have steel centre sills and draft gear connections, four hay racks and four water troughs, extending from centre doors to ends of cars, the flooring will be extra heavy, of special quality, and the ends will have steel posts and thick lining to provide for carrying rails, etc. Two side doors will be provided, each 5 ft. wide by 6 ft. 9⅝ ins. high, and the end doors will be 2 ft. wide by 14 ins. high, about 5 ft. above the floor, at one end, and 8 ins. wide by 8 ins. high, 18 ins. above the floor, at the other end.

Following are chief details of the U3d locomotives which the C.P.R. is building at its Angus shops, Montreal:—

Weight in working order	137,000 lbs.
Boiler, type	Straight top, radial stayed
Boiler pressure	200 lbs.
Wheel base, driving	11 ft. 6 ins.
Cylinders, diar. and stroke	18 by 26 ins.
Boiler tubes, no. and diar.	232 2 ins.
Heating surface, tubes	1,406 sq. ft.
Heating surface, firebox	138 sq. ft.
Heating surface, total	1,544 sq. ft.
Grate area	29 sq. ft.
Valves	11 ins. piston
Valve gear	Walschaert
Driving wheels, diar.	52 ins.
Brake equipment	Westinghouse ET 6
Lubricator	Detroit 22
Weight of tender loaded	90,000 lbs.
Weight of tender light	44,000 lbs.
Capacity, water	3,500 imp. gals.
Capacity, coal	10 tons

Following are the chief details of the 25 consolidation locomotives which the G.T.P.R. is having built by the Montreal Locomotive Works, as mentioned in our last issue:—

Cylinders, diar. and stroke	23 by 30 ins.
Driving wheels, diar.	63 ins.
Boiler pressure	180 lbs.
Boiler, outside diar. at front end	68⅜ ins.
Firebox	96⅞ by 75¼ ins.
Grate area	50.62 sq. ft.
Wheel base, driving	17 ft.
Wheel base, total engine	25 ft. 9 ins.
Wheel base, engine and tender	57 ft. 3½ ins.
Weight on leading truck	26,400 lbs.
Weight on drivers	184,800 lbs.
Weight total of engine	211,200 lbs.
Weight of tender	144,660 lbs.
Tender capacity, water	8,000 gals.
Tender, coal capacity	10 tons
Superheater	Schmidt
Fire doors	Franklin automatic
Valve gear	Walschaert
Brake equipment	Westinghouse E.T. for engine and tender, with cross compound pump

Following are chief details of the 400 steel underframe flat cars, 40 tons capacity, which the C.P.R. is having built by the Canadian Car and Foundry Co., Montreal, as mentioned in our last issue:

Length over end sills	36 ft. 4 ins.
Centre to centre of trucks	26 ft. 5¾ ins.
Length over dead woods	37 ft. 5¾ ins.
Length over floor	36 ft. 10 ins.
Width over floor	9 ft.
Width over side sills	8 ft. 10 ins.
Width over stake pockets	9 ft. 7⅝ ins.
Height top of rail to top of floor	4 ft. 2¾ ins.
Top of rail to centre of drawbar	2 ft. 10½ ins.
Draft springs	M.C.B. Class G
Couplers	Simplex
Air brakes	Westinghouse K.C. 812
Wheels	Cast iron, C.P.R. standard for 40-ton cars
Axles	M.C.B. 5 by 9 ins.
Journal bearings	Canadian Bronze Co.
Journal boxes	McCord mall. iron
Truck springs	C.P.R. standard
Brakebeams and bolsters	Simplex
Side bearings	Susemihl
Journal b aring wedges	Drop forged
Brake shoes	Steel back

The Grand Trunk Ry. has ordered 250 thirty-ton all wood refrigerator cars from the Canadian Car and Foundry Co. Following are the chief particulars:—

Length over end sills	40 ft.
Length over buffers	41 ft.
Length inside, clear	34 ft. ⅝ in.
Width over side sills	9 ft. ¾ in.
Width at eaves	9 ft. 6⅝ ins.
Width in clear	8 ft. 1⅜ ins.
Height top of rail to top of running board	12 ft. 8⅜ ins.
Clear height top of floor to under side of ceiling	7 ft. 2½ ins.
Draft springs	M.C.B. 6¼ by 8 ins.
Couplers	R. E. Janney
Body bolsters	Simplex
Air brakes	Westinghouse K.C. 1012
Truck, type	G.T.R. standard arch bar 30-ton
Brake beams and truck bolsters	Simplex
Truck springs	M.C.B. Class A
Wheels	33 ins. cast iron
Axles	Steel
Journal bearings	M.C.B.
Journal boxes	Cast iron

Following are chief details of the 75 ten-wheel simple superheater locomotives, class D 10, which the C.P.R. is having built by the Montreal Locomotive Works, as already reported:—

Weight on drivers	149,000 lbs.
Weight of engine	198,500 lbs.
Weight of tender	134,000 lbs.
Wheel base, driving	14 ft. 10 ins.
Wheel base, total, engire	26 ft. 1 in.
Wheel base, engine and tender	55 ft. ¾ in.
Boiler, type	Wagon top
Boiler pressure	200 lbs.
Heating surface, tubes	2,229 sq. ft.
Heating surface, firebox	180 sq. ft.
Heating surface, total	2,409 sq. ft.
Heating surfaee, superheater	408 sq. ft.
Grate area	49 sq. ft.
Tubes, no. and diar.	239 2ins. and 24 5 ins.
Cylinders, diar. and stroke	21 by 28 ins.
Driving wheels, outside diar.	63 ins.
Capacity, water	5,000 imp. gals.
Capacity, coal	12 tons
Axles	main 9½ by 12 ins., others 9 by 12 ins.
Brakes	Westinghouse E.T.6
Headlight	Pyle National Electric
Valve gear	Walschaert
Superheater	Vaughan and Horsey

Following are the chief details of the four Pacific type locomotives which the Central Vermont Ry. has ordered from the Baldwin Locomotive Works, as reported in our last issue:—

Cylinders	22 by 28 ins.
Valves	Balanced slide
Boiler, type	Straight, radial stayed
Boiler, diameter	70½ ins.
Boiler, pressure	200 lbs.
Firebox	96⅞ by 75¼ ins.
Tubes, no. and diar.	305 2 ins.
Heating surface, firebox	70 sq. ft.
Tubes, length	20 ft. 7 ins.
Heating surface, tubes	3,274 sq. ft.
Heating surface, firebrick tubes	28 sq. ft.
Heating surface, total	3,472 sq. ft.
Grate area	50.6 sq. ft.
Driving wheels, diar. outside	73 ins.
Journals	9½ by 12 ins.
Engine truck wheels, diar.	31 and 49 ins.
Journals	Front, 6½ by 10½, and 8 by 14 ins.
Wheel base, driving	13 ft. 4 ins.
Wheel base, total engine	33 ft. 2 ins.
Wheel base, engire and tender	62 ft. 3½ ins.
Weight on drivers	140,000 lbs.
Weight on front truck	38,000 lbs.
Weight on back truck	37,000 lbs.

O'Brien, McDougall and O'Gorman have ordered seven 10-wheeled freight locomotives, type 460, from the Montreal Locomotive Works for delivery in May. Following are the chief dimensions, etc.:—

Cylinders, diar. and stroke	18 by 24 ins.
Driving wheels, diar.	50 ins.
Boiler pressure	160 lbs.
Firebox	90 by 33¾ ins.
Tubes, no. and diar.	198 2 ins.
Tubes, length	12 ft. 3 ins.
Wheel base, driving	10 ft. 6 ins.
Wheel base, engine total	20 ft. 8 ins.
Wheel base, engine and tender	47 ft. 6 ins.
Weight on leading truck	26,000 lbs.
Weight on drivers	83,000 lbs.
Weight, total, engine	109,000 lbs.
Weight of tender	87,000 lbs.
Heating surfaces, tubes	1,261 sq. ft.
Heating surface, firebox	115 sq. ft.
Heating surface, total	1,376 sq. ft.
Grate area	21 sq. ft.
Tractive power	21,150 lbs.
Adhesion factor	3.92
Tender	Eight wheel type
Capacity, water	4,000 gals.
Capacity, coal	8 tons

Following are chief details of the eight ten-wheel locomotives which the C.P.R. is having built by the Montreal Locomotive Works, as mentioned in our last issue:—

Cylinders, diar. and stroke	19 by 24 ins.
Driving wheels, diar.	62 ins.
Boiler, diar. front end	54¾ ins.
Boiler pressure	180 lbs.
Firebox	96¼ by 41¾ ins.
Tubes, no. and diar.	117 2 ins. and 18 5 ins.
Tubes, length	11 ft.
Wheel base, driving	11 ft. 10 ins.
Wheel base, engine	22 ft. 1 in.
Wheel base, engine and tender	49 ft. 5¾ ins.
Weight on leading truck	38,500 lbs.
Weight on drivers	103,000 lbs.
Weight, engine, total	141,500 lbs.
Weight, tender	106,000 lbs.
Heating surface, tubes	926 sq. ft.
Heating surface, firebox	146 sq. ft.
Heating surface, total	1,072 sq. ft.
Grate area	28 sq. ft.
Maximum tractive power	21,380 lbs.
Factor of adhesion	4.82
Tender, type	8-wheel
Capacity, water	4,000 imp. gals.
Capacity, coal	10 tons
Weight, total engine	215,000 lbs.
Weight, engine and tender	350,000 lbs.
Tender wheels, diar.	34 ins.
Capacity, water	7,000 gals.
Capacity, coal	10 tons
Bell ringer	G.T.R. standard
Brakes	Westinghouse American E.T.
Steam heating	Gold system
Driving tires, springs and engine truck wheels	Standard Steel Works Co.
Superheater	Vaughan and Horsey
Headlight	Oil

Rutland Rd.—The Public Service Commission of the State of New York is being asked to sanction the transfer of the control of the Rutland Rd. from the New York Central and Hudson River Rd., to the New York, New Haven and Hartford Rd. The Rutland Rd. owns the Rutland and Noyan Ry. in Canada.

Manitoba and Northwestern Ry.—The Dominion Parliament is being asked to increase the company's bonding powers. The M. and N.W. Ry. is now owned by the C.P.R.

N. Curry, President, Canada Car Co., and Mrs. Curry, left Montreal, Feb. 9, for Jamaica, B.W.I.

J. L. Blaikie, who died in Toronto, Feb. 19, aged 88, was for some years a director of the old Northern Ry.

H. E. Grant, of the British Columbia Electric Ry., addressed the Vancouver branch of the National Electric Light Association, Feb. 7, on "Some Notes on Opportunity."

The American Railway Engineering Association's annual convention will be held at Chicago, Ill., Mar. 19 to 21, when the committee reports will be received and discussed. The speakers at the annual dinner will include Hon. F. D. Monk, Dominion Minister of Public Works.

Transportation Appointments Throughout Canada.

The information under this head, which is almost entirely gathered from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who may notice any error in our announcements will confer a favor by advising us.

Allan Line Steamship Co.—H. F. Bradley, heretofore General Passenger Agent for Ontario, Toronto, has been appointed Assistant Passenger Manager, Montreal.

G. H. O'Hara, heretofore in the auditing department, Montreal, has been appointed General Passenger Agent for Ontario, vice H. F. Bradley, promoted. Office, Toronto.

F. S. MacGregor, heretofore Travelling Agent for Ontario, has been appointed Assistant General Passenger Agent for Ontario. Office. Toronto.

Canadian Northern Ry.—W. A. Trenholm, heretofore in the General Passenger Department, Intercolonial Ry., Moncton, N.B., has been appointed chief passenger rate clerk in Assistant General Passenger Agent's office, C.N.R., Toronto.

A. Shields, General Master Mechanic, Winnipeg, is reported to have resigned to look after his private business.

H. Moore has been appointed Freight Overcharge Adjuster, with jurisdiction over all overcharge and station relief claims. Office, Winnipeg.

B. R. Marsales, heretofore City Freight Agent, Edmonton, Alta., has been appointed Contracting Freight Agent, Brandon, Man., vice T. J. Petterson, resigned.

J. G. Entwistle, heretofore locomotive engineer, Edmonton, Alta., has been appointed acting Superintedent, District 2, Western Division, vice C. D. Fisher, resigned. Office, Saskatoon, Sask.

Canadian Pacific Ry.—C. F. Reed, heretofore station agent, Greenville, Me., has been appointed Travelling Freight Agent, Atlantic Division, St. John, N.B., vice C. K. Howard, resigned to enter St. John and Quebec Ry. service.

The unsold portion of the company's land grants and any lands acquired through other companies in Manitoba, Saskatchewan and Alberta, the British Columbia Southern, the Columbia and Western and the Columbia and Kootenay land grants, the company's townsite properties west of Lake Superior excepting Vancouver, Kamloops and those on Vancouver Island, the company's coal lands and coal rights in Canada, as well as the mines at Lethbridge, Bankhead and Hosmer, the company's tie and timber operations in British Columbia, the company's irrigation works, and everything connected with the sale, development or investigation of any of these properties and works have been vested in a department to be known as the Department of Natural Resources.

J. S. Dennis, heretofore Manager of Irrigation and Land Interests in Alberta and British Columbia, has been appointed Assistant to the President. He will have charge of the Department of Natural Resources, and will perform such other duties as may be assigned to him by the President from time to time. All officers and employes of the several branches of the department will be under his supervision and direction. Offices. Windsor St. station, Montreal, and Calgary, Alta.

A Calgary, Alta., press dispatch says J. S. Dennis arrived there from Montreal, Feb. 22, and announced a number of appointments.

P. L. Nasmith, heretofore General Manager, Alberta Railway and Coal Co., Lethbridge, is reported to have been appointed Manager, Department of Natural Resources. Office, Calgary.

Thos. Heeney, heretofore Chief Accountant and Treasurer, Irrigation Alberta and British Columbia Land Department, is reported to have been appointed Assistant Manager, Department of Natural Resources and head of the treasury and accounting branch. Office, Calgary.

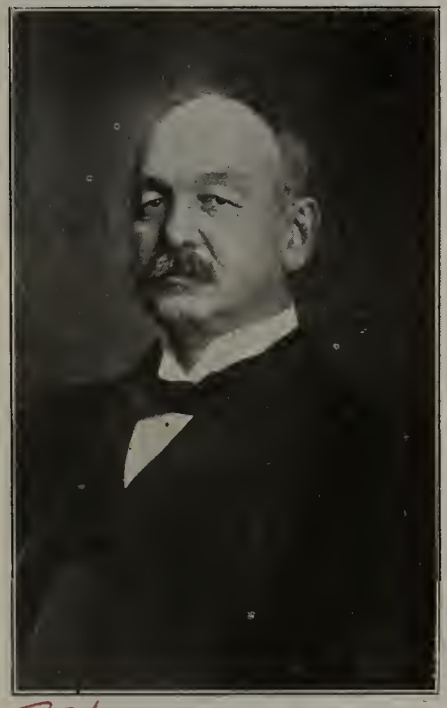
A. S. Dawson, heretofore Chief Engineer, Irrigation Department, is reported to have been appointed Chief Engineer, Department of Natural Resources. Office. Calgary.

F. Stockett, heretofore General Manager, C.P.R. collieries at Bankhead and Hosmer, B.C., is reported to have been appointed General Superintendent, Coal Mining Branch, Department of Natural Resources. Office, Calgary.

Allan Cameron, heretofore General Traffic Agent, New York, is reported to have been appointed Superintendent, Land Branch, Department of Natural Resources.

F. W. Russell, heretofore Chief Clerk, Land Department, Winnipeg, is reported to have been appointed Land Agent there.

F. T. Griffin, heretofore Land Commissioner, Winnipeg, will, it is said, remain thre in an advisory capacity.



P260 James Oborne,
General Superintendent, British Columbia Division, Canadian Pacific Railway.

A branch office for the sale of lands in Saskatchewan will, it is said, be opened at Saskatoon, in charge of W. G. Gerrow, from the Land Department, Winnipeg.

G. Hodge, heretofore Superintendent, District 2, Ontario Division, London, has been appointed General Superintendent, Eastern Division, vice F. P. Gutelius, resigned. Office, Montreal.

Consequent on the resignation of John Corbett, as announced in our last issue, the position of General Foreign Freight Agent has been abolished and the duties merged in those of W. T. Marlow and F. G. Frieser, Import and Export Freight Agents, respectively.

T. Hunter, heretofore clerk arranging diversions, has been appointed chief rate clerk, Import Freight Agent's office, Montreal, vice J. G. Galley, appointed Contracting Import Freight Agent, Atlantic Steamship Lines, as announced in our last issue.

G. H. Bull, H. M. Haas and F. L. Jones, of the International Correspondence School, Scranton, Pa., have been appointed Apprentice Instructors on the Eastern Lines. They will also give advice on questions connected with maintenance and operation of cars and locomotives. The headquarters of the first named are at Toronto, and of the other two at Montreal.

J. T. Arundel, heretofore General Superintendent, Manitoba Division, Winnipeg, has been appointed General Superintendent, Ontario Divlsion, vice Jas. Oborne, transferred. Office, Toronto.

H. C. Grout, heretofore Assistant Superintendent, District 1, Ontario Division, Havelock, has been appointed Superintendent, District 1, Ontario Dlvision, vice R. King, transferred. Office, Toronto.

G. H. Davis, heretofore transitman, District 4, Ontario Division, Toronto, has been appointed Assistant Engineer, Toronto Terminals.

J. J. Brignall, Travelling Passenger Agent, Toronto, is acting chief clerk to District Passenger Agent, Toronto, vice J. J. Rose, resigned.

R. King, heretofore Superintendent, District 1, Ontario Divislon, Toronto, has been appointed Superintendent, District 2, Ontario Division, vice G. Hodge, promoted. Office, London, Ont.

J. Simpson has been appointed Night Locomotive Foreman at Ignace, Ont.

John McLaughlin, heretofore Electrician at Fort William, Ont., has been appointed Resident Electrician there, vice T. Doust, resigned.

T. Spence, heretofore Car Foreman at Brandon, Man., has been appointed Car Foreman at Fort William, Ont., vice J. J. Corner, transferred to Brandon, Man.

F. Baird has been appointed Erecting Shop Foreman at Fort William, Ont.

D. C. Coleman, heretofore Superintendent of Car Service, Western Lines, Winnipeg, has been appointed acting General Superintendent, Manitoba Division, vice J. T. Arundel, General Superintendent, transferred to Ontario Division. Office, Winnipeg.

A. Hatton has been appointed acting Superintendent of Car Service, Western Lines, vice D. C. Coleman, appointed acting General Superintendent, Manitoba Division. Office. Winnipeg.

W. K. McLeod has been appointed acting Locomotive Foreman, Winnipeg, vice — Webster on sick leave.

J. J. Corner, heretofore Car Foreman at Fort William, Ont., has been appointed Car Foreman at Brandon, Man., vice T. Spence, transferred to Fort William, Ont.

T. Jones has been appointed Night Locomotive Foreman at Brandon, Man.

W. T. Daniel has been appointed Resident Engineer, District 2, Saskatchewar Division. Office, Regina.

F. J. Gage, Night Locomotive Foreman at Regina, Sask., has resigned.

F. Hill has been appointed Car Foreman at Sutherland, Sask.

C. H. Zerbach has been appointed Car Foreman at Moose Jaw, Sask.

R. Cooper has been appointed Assistant Car Foreman at Moose Jaw, Sask.

W. Jordan has been appointed Locomotive Foreman at Moose Jaw, Sask., vice G. Motta assigned to other duties.

C. W. Leggett has been appointed Car Foreman at Swift Current, Sask.

T. Bell has been appointed Locomotive Foreman at Outlook, Sask.

G. Benedict, agent at Harriston, Ont., is reported to have been appointed Supervisor of Agencies, Calgary, Alta.

R. Taylor has been appointed Locomotive Foreman at Dunmore, Alta.

C. A. Cotterell, heretofore Chief Dispatcher, District 1, British Columbia Division, has been appointed acting Superintendent, District 1, British Columbia Division, vice T. Kilpatrick on sick leave. Office. Revelstoke.

W. McKinty, heretofore Bridge and Building Master, Calgary, Alta., has been appointed Bridge and Building Inspector. Headquarters, Cranbrook, B.C.

J. A. MacDonald has been appointed District Passenger Agent, Nelson, B.C., vice W. J. Wells, resigned.

Jas. Oborne, heretofore General Superintendent, Ontario Division, Toronto, has been appointed General Superintendent, British Columbia Division, vice F. F. Busteed, at present on sick leave, but who, it is reported, will be appointed General Superintendent, Manitoba Division, Winnipeg.

Dominion Atlantic Ry.—Owing to increase in work in connection with the engineering and mechanical departments, Wm. Yould, heretofore Engineer and Mechanical Superintendent, has asked to be relieved of the duties of Engineer, and has been appointed Mechanical Superintendent. Office, Kentville, N.S.

M. A. Fullington, heretofore Resident Engineer, District 4. Ontario Division, C.P.R., Toronto, has been appointed Resident Engineer, D.A.R. Office, Kentville, N.S.

D. J. Murphy, Jr., heretofore Trainmaster and Assistant Traffic Superintendent, has been appointed Superintendent of Transportation, with which latter position the Trainmaster's duties are incorporated. Office, Kentville, N.S.

A. E. H. Chesley, heretofore Assistant Accountant, has been appointed General Accountant and Chief of Accounting Department. Office, Kentville, N.S. The position of Assistant Accountant has been abolished.

The offices of Accountant and Traffic Superintendent are abolished by the retirement of H. A. Prat and Wm. Fraser from the service.

G. A. Parker, heretofore Auditor, has been appointed Traffic Auditor. Office, Kentville, N.S.

G. Sterling, heretofore in the Paymaster's office, has been appointed Paymaster. Office, Kentville, N.S.

Grand Trunk Pacific Ry.—H. A. Woods, Assistant Chief Engineer, has transferred his office from Montreal to Winnipeg.

E. C. Ferguson has been appointed Car Foreman at Rivers, Man.

A. J. Roberts, heretofore General Foreman, Temiskaming and Northern Ontario Ry., North Bay, Ont., has been appointed Locomotive Foreman, G.T.P.R., Regina, Sask., vice C. E. Brooks, transferred.

C. E. Brooks, heretofore Locomotive Foreman, Regina, Sask., has been appointed Locomotive Foreman, Wainwright, Alta.

H. Gallagher has been appointed Roadmaster, Mountain Division. Headquarters, Prince Rupert, B.C.

Grand Trunk Ry.—S. J. Roy, heretofore station agent at Ingersoll, Ont., has been appointed Travelling Auditor. Headquarters, Montreal.

J. A. Clancy, heretofore car distributor and chief clerk to Master of Transportation, Durand, Mich., has been appointed Travelling Car Service Agent, Western Division, vice J. C. Talmage, promoted. He will investigate and report on car service conditions generally at all stations and perform such other duties as may be assigned to him from time to time. Office, Durand, Mich.

C. O. Busby has been appointed Master of Bridges and Buildings, Western Division, vice J. A. Sheedy, resigned. Office, Durand, Mich.

E. G. Hewson, heretofore Assistant Resident Engineer, has been appointed Resident Engineer, Middle Division, vice C. W. Power, resigned to enter Toronto city service. Office, Toronto.

Hudson Bay Ry.—J. P. Gordon, Winnipeg, has been appointed Assistant Chief Engineer, as reported in our last issue.

Intercolonial Ry.—D. McDonald, heretofore station ticket agent at Levis, has been appointed Superintendent, Montreal and St. Flavie District, vice W. A. Dube. Office, Levis, Que.

Minneapolis, St. Paul and Sault Ste. Marie Ry.—W. R. Sheldon, heretofore General Agent, Helena, Mont., has been

P261 J. F. Chapman,
Manager, Thousand Islands Ry. and Oshawa Ry.

appointed District Freight and Passenger Agent, Calgary, Alta.

New York Central Lines.—W. V. Lifsey has been appointed General Eastern Passenger Agent, vice E. J. O'Hayer, Jr., resigned. Office, 1216 Broadway, New York.

P262 D. J. Murphy, Jr.,
Superintendent of Transportation, Dominion Atlantic Railway.

Niagara, St. Catharines and Toronto Ry.—Consequent on the transfer of John Paul, heretofore Freight and Passenger Agent, to Canadian Northern Ry. service at Winnipeg, the duties of W. Phillips, General Freight Agent, lines east of Port Arthur and west of Ottawa, and R. L. Fairbairn, Assistant General Passenger Agent, lines east of Port Arthur, in Ontario and Quebec, Canadian Northern Ry., Toronto, have been extended to cover the N. St. C. and T. Ry., under the direction of G. H. Shaw, General Traffic Manager, C.N.R.

Pennsylvania Rd.—C. B. Brodie, heretofore chief clerk, District Passenger Agent's office, Washington, D.C., has been appointed Canadian Passenger Agent. Office, Traders Bank Bldg., Toronto.

Quebec Ry., Light, Heat and Power Co.—R. M. Reade has been appointed Superintendent, City Division, vice A. J. McDonald, resigned. Office, Quebec.

Reid Newfoundland Co.—E. P. Hughes has been appointed Travelling Engineer, covering territory between St. John's and Clarenville, including branches.

St. John and Quebec Ry.—S. B. Wass, A.M. Can. Soc. C.E., of Presque Ile, Me., is reported to have been appointed Assistant Chief Engineer with headquarters at Fredericton, N.B.

C. K. Howard, heretofore Travelling Freight Agent, Atlantic Division, C.P.R., St. John, N.B., has been appointed Right of Way Agent, St. J. and Q.R.

Thousands Islands Ry., Oshawa Ry.—J. F. Chapman, heretofore General Freight and Passenger Agent, has been appointed Manager, in charge of the Operating and Traffic Departments. He will continue to act as General Freight and Passenger Agent, Bay of Quinte Ry. Office, Deseronto, Ont.

White Pass and Yukon Route.—We are officially advised that the position of General Manager, left vacant owing to the appointment of O. L. Dickeson as President, as announced in our last issue, will not be filled for the time being at least.

Dump Ash Pans Specified for Locomotives.—The Board of Railway Commissioners passed order 15988, Feb. 17, as follows: "All railway companies subject to the Board's jurisdiction, operating steam locomotives, shall, on or before Dec. 31, 1913, equip such locomotives as may be in use with ash pans that can be dumped or emptied without the necessity of any employe going under such locomotive except in cases of emergency. After the said date it shall be unlawful for any such railway company to use any locomotive not equipped as above provided."

The Guelph Junction Ry. Co. has received from the C.P.R. $8,794.93, under the terms of the lease for the operation of the line for three months ended Dec. 31, 1911. The amount for the same period in 1910 was $7,801.07.

White Pass and Yukon Ry.—Gross earnings for 12 months ended Dec. 31, 1911, $1,067,590, against $1,199,358 for same period 1910.

G. Parent, son of S. N. Parent, ex-chairman of the National Transcontinental Railway Commission, was married in Quebec, Feb. 16, to Miss K. Grenier.

A Winnipeg press dispatch of Feb. 23 says the C.P.R. Construction Department has let contracts for building 308 miles of line, principally in Saskatchewan.

E. A. Robert, President, Montreal Tramways Co., is reported as having stated, Feb. 17, that orders had been given for 65 new cars, making 100 in all ordered by the company since Jan. 1; that 20 of the first order of cars had been delivered, and that it was expected to have nearly all the cars ordered on the lines by July 1. The cars are being built by the Canadian Car and Foundry Co.

National Transcontinental Railway Construction, Etc.

The amendments to the National Transcontinental Railway Act, rendered necessary by the decision of the Government to place the control of construction, etc., under one commissioner, are two in number. The first substitutes a new section for sec. 9 in the original act, declaring that the work is to be under the charge and control of one commissioner, who shall be a body corporate with the title of the Commissioners of the Transcontinental Railway. The second substitutes a new section for the original sec. 22 and authorizes the Minister of Finance, on the recommendation of the Minister of Railways, to pay claims and accounts approved and certified by the Commissioner, provided that no money shall be so paid until a sufficient appropriation has been made by parliament for the purpose.

G. Lynch Staunton, K.C., of Hamilton, Ont., has been appointed by the Dominion Government as Chairman, and F. P. Gutelius, M. Can. Soc. C.E., who recently resigned the General Superintendency of the Eastern Division, C.P.R., Montreal, as the other member of a commission to investigate all matters bearing on the actual construction of the National Transcontinental Ry., between Moncton and Winnipeg, the expenditures thereon, the system adopted for such construction and the management of the undertaking generally. The commissioners are given power to examine witnesses under oath and to exercise the widest possible powers under the act relating to public enquiries.

In the House of Commons, Feb. 14, the Minister of Railways read a statement showing work done on the line between Moncton and Winnipeg, up to Dec. 31, 1911, and the value of the work required to complete the line, on the basis of the estimated cost, as follows:—

Items.	Value of work done to Dec. 31, 1911.	Value of work required to complete
Grading, contract items, including clearing, excavation, culverts, substructures of bridges, tracklaying, ballasting, ties, signals, interlocking appliances, telegraph lines, fencing, water supply, track scales, temporary trestles, and extra work, also pump houses and pumps and substructure of Cap Rouge viaduct	$ 79,368,700	$30,510,300
Right of way and expenses	1,964,500	2,231,500
Rails and fastenings	10,214,500	2,985.500
Buildings	985,300	3,971,700
Steel superstructure of bridges, including flooring	4,611,400	1,441,600
Surveys and expenses	4,148,000	22,000
Engineering and expenses	7,681,700	3,850,300
Transcona locomotive shop plant and equipment, including water supply, sewerage system and lighting	2,334,300	602,700
Transcona car shop plant and equipment	171,200	1,129,800
Proposed car ferry at Quebec	.....	650,000
Terminals at Quebec, and line from Quebec bridge to Quebec city	508,500	9,091,500
Rentals of joint terminals at Winnipeg	131,300	118,700
Headquarters — Salaries and expenses	1,732,900	1,267,100
Total	$113,853,300	$57,872,700

The Minister went on to state that in addition to the estimated cost of $171,726.000 represented by the two columns in the above table, it had been calculated that the cost for interest to Dec. 31, 1913. would bring the total cost of the line to $187,781,128.68. The interest on this amount for seven years would be $39,434,031; the betterments, unforeseen and unestimated, $7,884,840.32; interest charges on this amount estimated at $900,000, making the capital estimated cost of the line to Jan. 1, 1921, $236,000,000. If the line was not taken over by the G.T. Pacific Ry. Jan. 1, 1914, there would have to be added another $4,500,000 for interest, and if the line did not earn 3% in excess of working expenditure for the three years after 1920, there would be $22,050,000 to be added to the cost for interest.

The engineer's report of progress laid before the House of Commons, Feb. 15, showed that there had been completed 1,587.7 miles or 76.82% of the grading; 1,378.7 miles of main line track, and 278.7 miles of track in sidings had been laid; 982.8 miles of telegraph lines strung, and 82.75% of the bridges built. The work done in the different districts was as follows:—

DISTRICT A.—Moncton to New Brunswick-Quebec boundary, 256.61 miles. Grading completed, 256.4 miles, or 99.5%; track laid, 256.4 miles; telegraph lines strung, 253.1 miles; bridges completed, 99.9%.

DISTRICT B.—New Brunswick-Quebec boundary to east abutment of Megiskan river bridge, 578.19 miles. Grading completed, 462.6 miles, or 80%; track laid, 445.5 miles; telegraph lines strung, 286.6 miles; bridges completed, 97.5%.

DISTRICT C.—East abutment Megiskan River bridge to Quebec-Ontario boundary, 121.94 miles. Grading completed, 77.7 miles, or 63.3%; track laid, 77.7 miles; telegraph lines strung, 24.7 miles; bridges completed, 27.2%.

DISTRICT D.—Quebec-Ontario boundary to 204 miles west of Cochrane, 276.11 miles. Grading completed, 264.6 miles, or 95.8%; track laid, 239.4 miles; telegraph lines strung, 144.2 miles; bridges completed. 95.5%.

DISTRICT E.—Mileage 204 west of Cochrane to 125 miles east of Lake Superior Jct., 195.19 miles. Grading completed, 154.8 miles, or 79.3%; no track laying, telegraph line or bridge work done.

DISTRICT F.—From 125 miles east of Lake Superior Jct. to Winnipeg, 375.90 miles. Grading completed, 371.6 miles, or 98.9%; track laid, 359.7 miles; telegraph line strung, 274.2 miles; bridges completed, 91%. (Feb., pg. 82.)

R. W. Leonard, Chairman, N.T.R. Commission, at a dinner given in his honor at Brantford, Ont., Jan. 30, after referring to the inception of the project, stated that the line in the Maritime Provinces went through a splendid agricultural country, and there was also a large area of good agricultural land in Quebec and Ontario, particularly in the clay belt of Ontario. There also was a large area of rocky country, the mineral value of which it was difficult at present to say. The whole country through which the line passed was capable of great development. The building of the line was a work of great magnitude, stretching as it did between two cities 1,804 miles apart, and crossing rivers which necessitated the building of 243 bridges of large size, in addition to the Quebec bridge, which, when completed, would have the longest span of its kind in the world.

Grand Trunk Pacific Railway Construction, Etc.

A deputation from Port Arthur, Ont., waited on the Dominion Government, Jan. 31, to discuss the entrance of the G.T.P.R. into that city. The matter has been under discussion for a long time, and the citizens are anxious that the connection be secured as soon as possible.

A contract has been let for the construction of an additional unit to the elevator at Fort William, Ont., operated by the Grand Trunk Pacific Terminal Elevator Co., to the John S. Metcalf Co., Montreal. The addition will be of concrete, with 2,500,000 bush. capacity, making the total capacity about 5,750,000 bush. The estimated cost of the addition is $500,000.

E. J. Chamberlin, Vice President and General Manager, is reported as having stated that a start has been made in laying out the company's yards on the acreage secured at Springfield, outside Winnipeg. It is said to be the intention to run all freight trains through Winnipeg to Springfield on a loop line across from the west, the plans for which will be announced, he expected, shortly. A large amount of work has yet to be done in and around the union station, and as soon as this is finished the present temporary tracks will be done away with, and the space taken up by them will be used for other purposes. It is expected that this work will be finished during the summer.

Replying to questions in the Saskatchewan Legislature, Feb. 2, the Minister of Railways said the G.T.P.R. had completed the grading of 133 miles of the branch line from Regina southerly, and the company's engineer had advised him that rails had been purchased for these lines. The route of the line had been approved to the International boundary near Frobisher.

Application is being made to the Saskatchewan Legislature to incorporate the Grand Trunk Pacific Saskatchewan Ry. Co. to build the following lines:— From tp. 9 or 10, range 13 west of the second meridian to Weyburn, thence southwesterly and westerly to the western boundary of the province between tps. 2 and 5. From tp. 16, range 19, west of 2nd meridian, southwesterly, effecting a junction with the previously mentioned line. From Saskatoon westerly and northwesterly to Battleford. From Watrous southwesterly through Swift Current to the International boundary between ranges 23 and 30, west of the third meridian. From Melville to Watrous. From Saskatoon southeasterly to Regina. From tp. 36, range 8, west of the 3rd meridian, southwesterly and westerly to a junction with the G.T.P. Branch Lines Co.'s Biggar-Calgary branch. The bill also provides that such other lines may be built as are authorized by the Lieut.-Governor in Council.

The Board of Railway Commissioners has approved of revised location plans of the G.T.P. Branch Lines Co. Cutknife branch from mileage 31.86 to 55.84, Sask.

The Premier of Alberta, in laying before the Legislature the Government's railway policy recently, said it included the guaranteeing of G.T. Pacific Branch Lines Co.'s lines for $20,000 a mile for a line southerly for 58 miles from the G.T.P.R. main line for the purpose of opening up an extensive coal mining area. An extension of time for a year for the completion of the lines under construction, for which the Government had guaranteed the bonds, would be granted by additional legislation.

On the main transcontinental line track has been laid to near Moose Lake at about mileage 28 west of the B.C. boundary, and about 56 miles west of Fitzhugh, Alta., to which point a train service is being operated. Supply trains are being operated to the track end, the freight then being carried overland to Tete Jaune Cache to await the opening of navigation for transhipment on the two steamboats which are being put together on the river. E. J. Chamberlin, V.P. and G.M., returned to Edmonton from a trip of inspection as far as Tete Jaune Cache, Jan. 31, and stated that he expects to see the track laid to that point

early in June. Construction is to be gone on with from Fort George both east and west, and good progress is reported to have been made on the rock work easterly of Kitselas. Track has been laid to the mouth of the tunnel 104 miles east of Prince Rupert, and the work will be resumed as soon as it is possible to get sufficient continuous grading ahead.

A permit has been taken out in Vancouver by the company for an overhead bridge across the C.P.R. tracks at the foot of Main St. to the docks. These docks are rapidly approaching completion, and it is expected that a start will be made early in the spring on the office building.

Capt. Nicholson, Manager, G.T.P. Coast Steamship Co., is reported as having stated in Victoria that plans are ready for the building which the company proposes to erect on Wharf St. in that city for office purposes, and that a contract will be let for its erection as soon as he receives advice from headquarters.

The company is carrying out a policy of building hotels at central points along its system. The work on the Fort Garry Hotel, Winnipeg, is being pushed rapidly; plans are being prepared for an hotel at Edmonton, Alta., and for hotels at Miette Hot Springs and in the vicinity of Mount Robson, in the Rocky Mountains, and contracts are being let for the hotel at Prince Rupert.

The company, in its general operations, proposes to open up during the current year 57 new townsites, and it has been announced through the Transcontinental Townsite Co., that a contract had been entered into for the building of 25 general stores in various towns along the line. (Feb., pg. 82.)

Grand Trunk Pacific Railway Construction Programme for 1912.

We are officially advised of the following construction programme for the current year:—

MAIN LINE.—Grading is proceeding between mileage 29, west of the Yellowhead Pass and Fort George, B.C., 205 miles, and between Hazleton and Fraser Lake, B.C., 200 miles. Grading up to these points, viz.: from Wolf Creek, Alta., westerly to mileage 29, west of the Yellowhead Pass, and from Prince Rupert easterly to Hazleton, B.C., has been completed.

Tracklaying is completed on the Mountain Division from Wolf Creek westerly to mileage 29, west of the Yellowhead Pass, 158 miles, and further work on track is being held up pending the finishing of certain heavy work between mileage 29 and 50 (Tete Jaune Cache). This will be proceeed with in the spring, and it is expected to lay 150 miles. At the Pacific end of the Mountain Division track has been laid from Prince Rupert to mileage 121, and is now proceeding. It is expected to lay continuously to Aldermere, 235 miles east of Prince Rupert. Further tracklaying beyond this point will not be continued until the latter part of this season.

BRANCH LINES.—The following branches under construction last season, are to be completed this:—

Brandon branch from Harte to Brandon, 24 miles.

Regina-Boundary branch from Regina southeasterly, 155 miles.

Regina to Moose Jaw, 40 miles.

Moose Jaw, northwest, 75 miles.

Prince Albert branch from Young to Prince Albert, 111.5 miles, 67 miles already completed.

Battleford branch, from Oban to Battleford, 48 miles.

Cutknife branch, from Battleford westerly, 50 miles.

Biggar-Calgary branch, from Biggar southwesterly, 104 miles.

Tofield-Calgary branch, 202 miles; 107 miles already completed.

Calgary to Lethbridge branch, 111 miles.

Alberta Coal branch, 56 miles, 31 miles already completed.

IMPORTANT WORKS.—Among the most important works to be carried out are an addition to elevators at Fort William, Ont.; freight shed and local freight yards at Edmonton, Alta.; yards and terminals at Fitzhugh, Alta.; Regina, Sask.; Mirror, Sask., and Calgary, Alta.

Railway Finance, Meetings, Etc.

Canadian Pacific Ry.—A dividend of 2% on the preference stock for the half year ended Dec. 31, and a dividend of 2½% on the common stock for the quarter ended Dec. 31, payable April 1 to stockholders of record of Mar. 1, have been declared. The dividend on common stock is payable as to 7% per annum out of revenue, and as to 3% per annum from interest on proceeds of land sales and other extraneous assets.

Notice has been sent to the shareholders subscribing to the issue of $18,000,000 of common stock, that, in addition to the $30 a share already paid, payments are due as follows:—$30 per share on April 12, June 14, Aug. 16, and Oct. 18.

Dominion Atlantic Ry.—Approximate gross earnings for Jan., passenger $32,300, freight $54,900, total $87,200, against $47,500 total gross earnings for Jan., 1911.

Grand Trunk Ry.—Application is being made to the Dominion Parliament for authority to acquire and deal with bonds and debentures issued or to be issued by the G.T. Western Ry., not exceeding $30,000,000. Power is also asked to issue £250.000 of G.T.R. 4% consolidated debenture stock to aid in the financing of any companies now or hereafter to be incorporated, the controlling interest of which is held by the G.T.R. or the G.T. Pacific Ry., or in the name of trustees for either of these companies.

Grand Trunk Pacific Ry.—Application is being made to the Dominion Parliament to authorize a further issue of perpetual or terminable debenture stock not exceeding £5,000,000, for the purpose of completing the railway, the building of branch lines, the purchase of rolling stock, and the company's general purposes.

Intercolonial Ry.—An Ottawa press dispatch Feb. 9. says the receipts for the current financial year which ends Mar. 31, show to Jan. 31, an increase of $600,000 in excess of those for the corresponding 10 months of 1909-10. There will be an increase in the expenditure, as it is estimated the increase of wages given the employes will amount to over $400,000.

Kingston and Pembroke Ry.—Press reports state that the C.P.R. is negotiating with the holders of the minority stock with a view to securing the complete ownership of the line.

Lake Champlain and St. Lawrence Jct. Ry.—A meeting of shareholders will be held in the C.P.R. offices, Montreal, Mar. 4. for the purpose, among other matters, of authorizing the issue of certificates of capital stock to the shareholders.

The Minneapolis, St. Paul and Sault Ste. Marie Ry. has sold to W. A. Read and Co. an issue of $1,500,000 first consolidated 4% bonds, interest guaranteed by C.P.R. The bonds have been offered to the public at 97½.

New York Central Lines.—A lease and agreement between the Guaranty Trust Co., of New York, and the New York Central and Hudson River Rd., the Lake Shore and Michigan Southern Ry., the Michigan Central Rd., and the Cleveland, Cincinnati, Chicago and St. Louis Rd., has been deposited with the Secretary of State at Ottawa. The Canadian lines affected are the Canada Southern Ry., the Toronto, Hamilton and Buffalo Ry. (as to the interests outside the C.P.R.), and the Ottawa and New York Ry.

Pere Marquette Rd.—The Saginaw board of trade has petitioned the Attorney General of Michigan to take action against the P.M. Rd., in the interest of the shareholders and the public. The petition alleges that the company is insolvent, because of the high rate of interest paid on its obligations, which are said to have increased by $20,000,000 within the last four years; that the line is not being properly maintained, and that it is unable, therefore, to properly serve the transportation needs of the State.

The P.M. Rd. owns the Lake Erie and Detroit River Ry. in Canada, and runs its train through between St. Thomas, Ont., and Buffalo, over the Michigan Central Ry. It also operates, through the L.E. and D.R. Ry., the London and Port Stanley Ry.

Rutland Rd.—Application is being mad to the New York State Public Service Commission in the interests of the minority stockholders of the Rutland Rd. with a view of compelling the New York, New Haven and Hartford Rd. to purchase their stocks at the same price it is paying the New York Central and Hudson River Rd. for the majority stock. The Rutland Rd. Co. owns the Rutland and Noyan Ry. in Canada.

Victoria and Sidney Ry.—The British Columbia Courts, Jan. 30, refused to grant an order, asked for by the Victoria city council, for sequestration. The difficulties between the city and the company are of long standing, and if a settlement is not made in the meantime, the matter will again come before the court in July.

Wabash Rd.—A bill for the foreclosure of a mortgage for $40,000,000 on the Wabash Rd., held by the Equitable Trust Co., New York, as trustee, was reported to have been filed in Detroit, Mich., Feb. 16. Interest on the mortgage bonds amounting to $812,000 was due Jan. 1, which indebtedness is admitted by the company. F. A. Delano, W. K. Bixby and E. B. Pryor, St. Louis, were appointed receivers, and were given permission to issue receivers' certificates aggregating $10,000,000 for the benefit of the property.

Wisconsin Central Ry.—An issue of $3,500,000 of first and refunding 4% mortgage bonds, due 1959, is being placed on the London, Eng., market at 89. The W.C. Ry. is controlled by the Minneapolis, St. Paul and Sault Ste. Marie Ry., which in its turn is controlled by the C.P.R. It is reported that about 90% of the issue has been taken up by the underwriters.

Alberta and Great Waterways Ry.—The Premier laid before the Alberta Legislature, Feb. 8, a statement of the claims made in connection with the cancellation of the contract for the building of this railway. The filed amount is $3,190,001.29, of which $2,500,000 is claimed by the construction company, $372,648.16 by the Royal Bank, and $317,353.13 for goods supplied and services rendered, for grading work done, claims against sub-contractors, damages for breach of contract, and for money advanced or promised for special services. A number of the claims are duplicated and this will be thoroughly investigated. No details are given as to how the two largest claims are made up.

Canadian Northern Railway Construction, Betterments, Etc.

The St. Charles and Huron River Ry. Co. has been incorporated by the Quebec Legislature. The route proposed starts from the Quebec and Lake St. John near St. Ambrose de la Jeune Lorette to the Huron River in St. Edmond of Stoneman, about eight miles. The provisional directors are W. S. Barclay, F. M. Spaidal, W. A. Kingsland, and L. A. Cannon. Quebec, the first three of which at least are Canadian Northern Ry. officials. The proposed line is a direct off-shoot of the Quebec and Lake St. John Ry., and is projected to bring traffic to the main line in the shape of summer residents and pulpwood.

It will run up the St. Charles river from Lorette and tap St. Charles and a very pretty country in the Laurentian mountains. The construction will be easy throughout. (Jan., pg. 23.)

Montreal Terminals.—The purchasing of land near Montreal and in the city in connection with the proposed tunnel and terminals. continues. A good deal of this is for C.N.R. purposes. The land not directly required for right of way and terminal purposes has been acquired by syndicates for disposal to industrial concerns. and for residential purposes. Plans have been prepared for laying out the new town at the back of the mountain. and it is stated that development work will be gone on with during the summer.

The general plans for the terminal station are being considered by the Montreal city council.

The financing of the project is reported to have been arranged. and that an issue of $7.500,000 of bonds having been taken by J. P. Morgan's London, Eng., house.

Montreal-Port Arthur Line. — The work on the line, which is to give a direct route from Montreal to Ottawa, is expected to be finished this year. The line which is being built by J. P. Mullarkey, runs from the portal of the proposed tunnel under Mount Royal to near Hawkesbury, Ont. The cold weather has somewhat delayed bridge construction. but it was reported, Feb. 15, that the piers and abutments for the bridge from St. Eustache to Ile Jesus were practically finished, and that the work on the piers and abutments of the bridge from Ile Jesus to Montreal Island would be started early in the spring.

The line from near Hawkesbury to Ottawa is already in operation. In connection with the question of the entrance of the company's several lines into the centre of Ottawa, Sir Wm. Mackenzie is reported to have said that he had had several conferences with the Dominion Government and city authorities, and that a complete settlement of all the points is expected at an early date.

West of Ottawa J. P. Mullarkey has a contract for building about 90 miles to Pembroke. The route crosses the Ottawa River at Fitzroy harbor, near the Chat Rapids. and follows the river in the province of Quebec as far as Portage du Fort. where it crosses to the Ontario side. and proceeds on to Pembroke. The piers and abutments of the two bridges, 2,600 ft. and 1,200 ft. long respectively, are being built.

Protests are being made by citizens of North Bay against the route of the line through the town which has been approved. and the matter was discussed by the town council, Feb. 15. when the agreement came up for ratification. The council declined to ratify the agreement, and decided to ask the Board of Railway Commissioners to decide as to the route.

The Board of Railway Commissioners has approved of location plans for the line through Nepean, March and Tarbolton tps., mileage 14.3 to 27 from Ottawa; through Ross. Westmeath and Pembroke tps., mileage 67 to 83.45 from Ottawa; through Springer, Field, Badgerow, Gibbons and Crerar tps., mileage 366 to 386 from Montreal, and through unsurveyed territory in Algoma district, mileage 327 to 343.15 from Sudbury Jct., Ont.

Canadian Northern Ontario Ry.—The Board of Railway Commissioners has authorized the company to build a line from Stanley St., Trenton, to the railway bridge across the Trent river, to connect the Central Ontario Ry. with the company's Toronto-Ottawa line. The Commissioners have also authorized the opening for traffic of the line from Harrowsmith to Sydenham, mileage 160.50 to 163.60 from Don Jct., Toronto. From Sydenham to Ottawa the line is under contract, and considerable progress has been made with the grading. It is expected that track will be laid over it by Dec. 31.

The plans for the company's line across North Toronto are being worked out. as also are the plans for the line from Toronto to Hamilton and Buffalo. Several surveys have been made through Hamilton and the Niagara peninsula, and plans have been filed. Those for the line through Hamilton were filed Feb. 22, but have not been approved.

Press reports stated recently that the company was considering plans for a line to Kincardine. Ont. We are officially advised that while at some distant date such a line might be built. the company is not considering it at present.

Canadian Northern Ry.—Speaking in a general way at Winnipeg, Jan. 29, on his way back to Toronto from the Pacific coast. Sir Wm. Mackenzie is reported to have said that the company has in contemplation the spending of $25,000.000 on construction west of the Great Lakes this year. Work on the branch lines in the prairie provinces will be pushed in all directions as far as men and materials can be got. The building of a second track from Port Arthur to Winnipeg will have to be undertaken very shortly. A large stretch of the main line between Edmonton and Port Mann will be completed during the year. Several miles of steel had been laid at either end. and it is hoped to get steel laid to the Yellowhead Pass from the east, and to Kamloops from the west, by the end of the current year. The main line from Winnipeg to the coast will be completed by the end of 1914.

In connection with the press reports that additional storage facilities are to be provided at Port Arthur in time for handling the crop of the current year, we are officially advised that nothing definite has been decided on.

We are officially advised that the betterments to be undertaken during the current year include the completion of the fill across Rainy Lake. a solid rock bank wide enough to permit of the laying of a double track; the increase of yard accommodation at Port Arthur, Rainy River, Winnipeg, Dauphin, Saskatoon, and Edmonton; building passing tracks at a large number of places along the entire line; the building of station and section houses at various points on the line; a considerable amount of ballasting all along the line; and the replacing with 80 lb. steel of a considerable mileage of the track between Portage la Prairie. Man., and Kamsack. Sask.

In an interview at Winnipeg, Feb. 15. M. H. MacLeod, General Manager and Chief Engineer, is reported to have said that the work of reducing the gradient on the line from Winnipeg to Fort Frances to 0.4% will occupy a lot of attention this year. There is no intention of double tracking the line as yet, but the bridges on the route will be made ready to carry a second track. The work of grade reduction and general betterment is about completed between Port Arthur and Fort Frances.

In an interview a few days previously Mr. MacLeod is reported as having stated that several miles of tracks would be added to the yards at Fort Rouge, but that nothing definite had been arranged in regard to a suggested new yard east of Winnipeg.

Sir Wm. Mackenzie is reported as saying that a project is under consideration for building a cut-off from Morris to Vita, so as to enable traffic from southern Manitoba to be handled without going through Winnipeg, but that it is still in the future. In connection with this project, press reports state that surveys are being made for a line from near Portage la Prairie, via Culross and Sperling, to Morris, the construction of which would enable through freight from all parts to be hauled to Port Arthur without going into Winnipeg.

The Board of Railway Commissioners has authorized the opening for traffic of the line from Grosse Isle, Man., to the end of track, 31 miles.

Application is being made to the Saskatchewan Legislature to incorporate the Canadian Northern Saskatchewan Ry. Co. to build the following lines of railway:—From Kipling westerly to New Warren; from Lampman northerly to a junction with Brandon-Saskatchewan line of the C.N. Ry.; from Moose Jaw easterly to Regina; from the Delisle branch to the western boundary of the province; from Chamberlin southerly to Moose Jaw: from Craven northeasterly to Hudson Bay Jct., with a branch to near Yorkton on the C.N.R. Rossburn branch; from Humboldt westerly to Saskatoon: from Langham southeasterly to Saskatoon; from Melfort northeasterly, to the eastern boundary of the province; from Hudson Bay Jct. southerly, to near Maryfield. on the C.N.R. Brandon-Regina line. from Swift Current northerly to Battleford; from Chamberlin westerly and north of the North Saskatchewan River to the western boundary of the province; from Prince Albert northeasterly to the eastern boundary of the province; from the C.N.R. Prince Albert-Denholm line to the C.N.R. North Battleford-Jackfish line; from near Moosomin to the southern boundary of the province; and also such other lines as are authorized by the Lieut.-Governor-in-Council.

The Board of Railway Commissioners has authorized the opening for traffic of the Rossburn extension from Hamton to a connection with the Edmonton line east of Canora, Sask., 15 miles.

Tenders were received to Feb. 23 for building the substructure for a subway under the company's railway on 23rd Street, Saskatoon. The work is being done jointly by the company and the city council.

We are officially advised that the company is not making a survey for a line from Bruderheim to Medicine Hat. Alta., as press reports state.

We are officially advised that the construction programme for the year had not yet been definitely settled. It is expected, however, to grade and have track laid on the main line from Edmonton to Yellowhead Pass by the close of the year, in addition to the work going on in British Columbia, which is referred to further on. It is also expected to complete the line between Vegreville and Calgary, Alta., and the line between Alsask and Munson, Alta. This latter will give the company a through line from Saskatoon to Calgary. The line to the Brazeau coal fields, 170 miles, is also expected to be completed this year.

The proposals for aiding railway

building in Alberta, as stated in the Legislature by the Premier recently, provide for the guaranteeing of Canadian Northern Western Ry. and C.N. Ry. bonds for 1,405 miles of line, but as the guarantees in respect of 150 miles are revotes of former votes, the new mileage guaranteed is 1.255. The guarantees are at the rate of $20,000 a mile in respect of 250 miles; at the rate of $15,000 a mile in respect of 415 miles (150 miles being revotes of former guarantees); and at the rate of $13,000 a mile in respect of 640 miles. The lines covered by these guarantees are as follows:—Peace River line from Onoway towards the Peace River, 250 miles; from Athabasca Landing for 100 miles in the direction of Peace River; from Athabasca Landing to Fort McMurray, 175 miles, and a branch line therefrom to Lac la Biche, 40 miles; from north of the Saskatchewan River towards St. Paul de Metis, 100 miles; from south of the Saskatchewan River through Bruderheim to the western boundary of the province, 200 miles; from west of the Calgary and Edmonton Ry. to the west of Pigeon Lake, 100 miles; extension of the Brazeau line southeasterly to the C.N.R. Goose Lake line, 130 miles; extension of the line from Camrose for 80 miles; from Calgary, east of the Calgary and Edmonton Ry., 100 miles. Under the C.N.R. the guarantees will be given for the extension of the Goose Lake line from the eastern boundary of the province to the junction with the Vegreville-Calgary line at the crossing of the Red Deer River, 130 miles. The C.N.R. and its subsidiary companies has under construction in the province 957 miles of railway, including 253 miles of the mine line west of Edmonton. Of these lines, 742 miles have been graded, including 150 miles of the main line, and 380 miles of track, including 35 miles on the main line, has been laid. There is therefore about 600 miles graded and ready for tracklaying, and that mileage can be got ready for operation this year. Of the lines on which track has been laid, 207 miles have been placed in operation. It is expected to have the lines already guaranteed and partly constructed, as well as the whole of the lines now to be placed in operation within four years. The company will be given, under extra legislation, an extension of time for the completion of the lines under construction for which the Government has guaranteed the company's bonds. The acts giving effect to the guarantees have been passed by the Legislature.

A press dispatch Feb. 5, stated that track had been laid into Athabasca Landing, and that it would take a month to finish up the work on the branch.

Canadian Northern Pacific Ry.—The British Columbia Minister of Railways informed the Legislature recently that the C.N.P.R. Co. had deposited with the department plans and profiles of its railway, as required, and that the same had been approved. The maximum gradient on the mainland is 0.4%, and on Vancouver Island 1.50%. The maximum curvature is 10 degrees, and the minimum 0.30 of a degree.

Tracklaying on the line from Port Mann easterly was reported to have reached Chilliwack, Feb. 10. The building of the bridge over the Coquihalla River near Hope was started Feb. 1. G. Brant being engineer in charge. The grading and other work on the line easterly from Hope is making rapid progress, and it is expected to have track laid to Kamloops by the end of the year.

Press reports state that engineers are making surveys for a branch line from Kamloops to Vernon, about 80 miles, and that A. E. Ashcroft is in charge of the party working out of Vernon. Mr. Ashcroft is understood to be making surveys for the Coteau Power Co.'s line, an electric project, which Mackenzie, Mann and Co. have acquired control of.

Vancouver Island—In an interview at Victoria, on the occasion of his recent visit, Sir Wm. Mackenzie is reported as stating that the grading on the first 35 miles of the line out of Victoria is practically completed, and that the work on the rest of the 100 miles is under way. Arrangements are reported as being made to secure ferry terminals on the Island as well as on the mainland. (Feb., pg. 74.)

Grand Trunk Railway Betterments, Construction, Etc.

Central Vermont Ry.—E. H. Fitzhugh, President, C.V. Ry., and other officers are named as provisional directors of the Barre Granite Ry., a company incorporated in Vermont State to build a line of 10 miles from Barre, Vt., to a connection with the C.V.R. at Williamstown, Vt.

New England Proposals—The Southern New England Ry., Feb. 8, invited bids for the building of the line from Palmer, Mass., to Providence, R.I. Contractors are asked to submit prices for the completion of everything in connection with the extension of the line, the work to be completed by Dec. 31, 1913. The company is applying to the Massachusetts Legislature for authority to build the following lines;—from Windsor, Vt., to Boston; from Boston to Blackstone, and from a point in Douglas county to Worcester, Mass. The authorities in control of Boston harbor propose to expend $50,000,000 upon its improvement in order to provide for the increasing business and to facilitate the entrance of the new line.

Lachine, Jacques Cartier and Maisonneuve Ry.—The Board of Railway Commissioners has approved of the location of this line from 40 ft. west of the C.P.R. crossing at Iberville St. to the terminal at St. Catherine St., Montreal, through C.P.R. lands, subject to an agreement between the two companies.

Montreal Grade Revision.—The proposed grade revision in Montreal continues to be discussed by the city board of control, as well as by local representative bodies. Deputations representing St. Henry, Ste. Cunegonge and St. Joseph wards waited on the board of control recently and argued in favor of the depression of the tracks instead of their elevation in the city.

East Toronto Yards.—The company is reported to have purchased a large area of land between Carlaw and Boston Avenues, east of the Don, from the Toronto city council and other owners for yard purposes.

Orillia, Ont.—We are officially advised that the press reports stating that a site had been purchased in Orillia on which to erect an office building, and that a new station would be built opposite the C.P.R. station at Mississaga St. in that town, are without foundation.

West Toronto to Weston.—A press report states that it is proposed to lay a second track from West Toronto to Weston during the present year, and that the possibility of building a second track right through to Sarnia is being considered.

Hamilton, Ont.—Press reports state that there is every reason to believe that the plans for the new station in Hamilton will be submitted to the city council at an early date. The City Engineer states that the plans, when submitted, will provide for a station on Ferguson Ave., between King and Barton Streets.

St. Catharines, Ont.—A deputation from the city council waited on G.T.R. officers at Montreal, Jan. 30, with regard to the proposed high level traffic bridge over the old Welland canal on the road to the G.T.R. station, and also about the proposed new station at St. Catharines. The cost of the bridge is estimated at $175,000, and the city is asking the company to contribute $50,000 towards its construction. The Chief Engineer promised to visit the city and look into the project early in March. The deputation was informed that the company had under consideration a plan for building a spur from the main line to the northern section of the city to connect with the Welland division line.

Port Colborne, Ont.—Press reports state that the company has leased from the Dominion Government all the Government land lying between the G.T.R. Welland line and Welland St., and is purchasing adjoining lands. The land, it is said, will be used for yard and station purposes.

International Bridge.—We are officially advised in connection with the press report that the International bridge at Black Rock was about to be rebuilt; that during 1911 the portion of the bridge over the Black Rock harbor was replaced, owing to improvements being made in the channel by the U.S. Government, and that at present the company is not considering the replacement of the bridge. (Feb., pg. 85.)

Automatic Signals on the Canadian Pacific Railway.

The C.P.R. has placed an order for automatic block signals to equip 192 miles of line, including about 33 miles of double track. This is probably the most extensive installation of automatic signals in Canada. The termini of the sections to be signalled are as follows:—

St. John, N.B., to Vanceboro, Me., 90.25 miles single track.

Brigham Jct., Que., to Montreal Jct., 34.5 miles single track and 9.5 miles double track.

Place Viger, Montreal, to Ste. Therese, Que., 20 miles double track.

West Toronto to Bolton, Ont., 21.6 miles single track.

Islington to Streetsville, Ont., 12.9 miles single track.

Romford Jct. to Sudbury, Ont., 3.2 miles single track and 3.8 miles double track.

The Hall Signal Co.'s style K top post signals, with the arms working in the upper quadrant and three positions, will be used, and the work of installation will be begun in the spring after the frost is out of the ground. On the C.P.R. the night signal colors are green for proceed, yellow for caution and red for stop. The signals will be arranged to stand "normal danger," and the apparatus and construction will conform to the specifications of the Railway Signal Association.

Papers on Transportation.—Collingwood Schreiber C.M.G., General Consulting Engineer for the Dominion Government and Chief Engineer, National Transcontinental Ry. Western Division, read a paper, "A short sketch of the development of transportation facilities in Canada" before the Canadian Society of Civil Engineers in Montreal, Feb. 8. At the same meeting A. Surveyer read a paper on the cost of transportation by land and water.

Vancouver Branch Canadian Society of Civil Engineers.—At the annual meeting, Feb. 4, the following were elected officers for the current year:—Chairman, C. E. Cartwright; executive committee—J. C. Kennedy, L. G. Robinson, H. P. Archibald; Secretary-Treasurer, W. A. Kennedy. The branch has a membership of over 100.

Electric Railway Department

Steel Body Cars for the Montreal Tramways Company.

The Montreal Tramways Co. is having a series of steel-body cars built to the designs of D. E. Blair, Superintendent of Rolling Stock. The first of these cars, shown in the accompanying fig. 1, was delivered about the beginning of the year by the Canadian Car and Foundry Co.

In general appearance they closely resemble the last series of cars built for the company, the principal point of difference lying in the careful design which has in view the elimination of as much weight as possible without at the same time decreasing the strength. This feature has been successfully accomplished, a considerable saving in car weight being obtained with a stronger and more substantial car.

The elimination of excessive weight in street car design has been made a subject of exhaustive study by Mr. Blair. He partially bases his claims for more attention to weight reduction on the fact that "careful investigation would seem to indicate that the cost of maintenance of car equipment is in direct proportion to the total weight of the car, and there is every reason to believe that the wear and tear of track and roadway increases to an equal ratio. This is especially so if the car weights have increased beyond the capacity of the older roadbeds and rails, and it has been deemed advisable to replace a soft and resilient rail foundation with a hard, unyielding bed of concrete in direct contact with the rail." This subject was thoroughly treated by him in a paper read at the Canadian Street Railway Association's annual meeting in 1910 and published in The Railway and Marine World for Sept., 1910, from which the foregoing extract is taken.

He went on further to show from deductions made on other roads that taking the conservative figure of 5 cts. for the operating cost per lb. of car per year, it would be a paying investment for any road to pay $1,000 for every one-ton reduction in car weight. Under operating conditions not as favorable as that just cited, an even greater premium might profitably be paid for weight reduction. This alone is based on the cost of power as produced, neglecting the fact that all power saved means a greater operating capacity for a given plant, without further power plant additions. This incidentally relieves much capital from being tied up in this manner.

A marked advance in car weight reduction has been accomplished in these cars. The former cars of exactly similar general size and seating capacity—to seat 40—weighed complete 53,000 lbs. The cars of the new 1,200 series here to be described weigh 44,000 lbs., a saving of about 9,000 lbs. So much, in fact, has the body weight been reduced that the truck manufacturers were willing to supply a size lighter truck than those used in the last cars, it being felt that these new cars were sufficiently light to warrant their use as safely as the heavier truck with the old design. Other savings might be had were the equipment manufacturers as interested in weight reductions as the operating companies. More mention will be made of this later.

FRAME.—The main point of design towards weight elimination, lay in the careful and studied design of the car frame, to place the members just where they will do the most good, and at the same time make a careful selection of those shapes which are of such inherent construction as to increase the strength of the general design with the use of less metal. To further quote Mr. Blair:

Fig 1—Steel Body Cars for the Montreal Tramways Co.

"There has been no limit set to the weight of car, and the builder finds it more convenient, perhaps on account of limited shop facilities and perhaps because it is cheaper, to use standard commercial shapes and dimensions where a lighter shape of better design would have done as well."

The essential part of the design upon which all the rest of the design depends, is that of the girder plate. This new design is shown in fig. 2. In the former design a long beam was built up of ⅛-in. plate, the depth from belt rail to bottom of car body. It being impossible to secure plates of sufficient size to make the side out of one continuous piece, riveted joints had to be resorted to. This new design dispenses with such a construction.

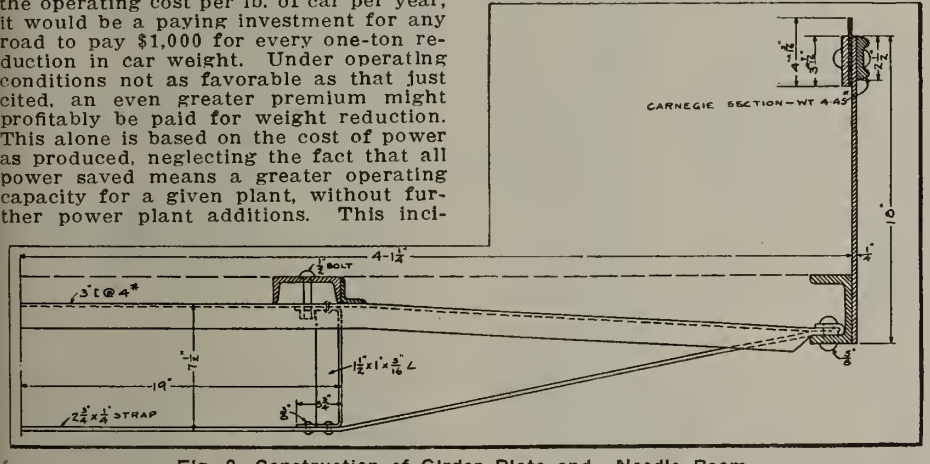


Fig. 2—Construction of Girder Plate and Needle Beam.

It was felt that while ⅛-in. was sufficiently great, as far as strength alone was concerned, it was not sufficient to withstand all the wear and tear to which the side of a car is subjected, especially in narrow, crowded thoroughfares such as exist in Montreal. Simplicity of repair was also a question of equal importance with that of weight elimination, these two being the big desiderata.

If a thicker sill plate could be employed, as a natural consequence it would not have to be as deep for a given strength when acting as a beam. What was even more important, narrow plates could be secured from the mill in sheets of such length as to require no splicing. This, combined with the fact that a heavier plate is less subject to injury from side blows, led to the adoption of a shallower but thicker plate, the depth only being about half that used in the former design. This girder is the narrow strip between the two black lines at the bottom of the car body, as seen in fig. 1. The construction of this supporting girder plate is shown in fig. 2, which also shows one of the needle beams.

This girder plate, as fig. 2 shows, is a composite member, built up so as to resemble in qualities an I-beam girder. A ¼-in. web plate, 18 ins. deep, is secured by a single row of rivets to a heavy 4x2½x½ in. ship channel at 13.6 lbs., in the manner indicated. This forms the tension member of a built-up girder. At the top of the web plate a composite member is built up, composed of a bar section, and a special Carnegie section of such a shape as to have the outside rivets come below the surface. This composite section forms the upper member of the girder. The upper, or compression member, is further reinforced for a distance of 5 ft. from the rear end by the addition of a 3 x 7-16 in. plate as shown in the illustration. Such a construction constitutes a strong, light, rigid girder, in various ways superior to the old design. This girder runs the full length of the car body, following the corner curvature at front and rear vestibules, producing a strong corner construction for the withstanding of shocks.

Particular emphasis might be drawn to the fact that while weight reduction was one of the great desiderata, the main factor kept in mind throughout the design was to produce a car both strong and rugged in design, yet light, which would still be proof against the many abnormal bumps and consequent stresses to which large cars are subjected in crowded thoroughfares.

The balance of the frame, of which these side girders are the principal members, is shown in fig. 3. It is 32 ft. 3 ins. long. The 4x2½x½ in. heavy channel which forms the tension member of the side girders continues along both sides. The ends, joined to the sides by gusset plates, are 6 1-16 x 3 9-16 x 7-16 in. Z-bars at 18.3 lbs. These sections across the ends are each further reinforced by a 2 x ½ in. truss plate supported on a 12-in. length of 6-in. channel, in the manner indicated. This construction is calculated to make the car body uncol-

lapsible from any reasonable end impact, the assumption being that the affected vestibule will crush, leaving the body comparatively free from damage. This is in line with the contentions being advanced by many railway car builders to the effect that vestibule construction should be weak as compared with the balance of the car, acting either as a resilient or collapsible body to protect the main structure.

A front vestibule projecting forward a distance of 5 ft. 7¾ ins. is carried on two 6-in. channels at 10 lbs., one at each side, supported from the main frame in the manner indicated in the plan and elevation of the end construction. On the outer end of these channels there is a steel bumper, built up of a 6-in. 10.5-lb. channel and 3-16-in. cover plate.

Intermediate to the outside supporting channels, there are two 6-in. 9-lb. angles for the support of the vestibule floor structure. They are carried at the front by the bumper, and at the rear by the body end Z-bars.

The rear vestibule construction required some very careful designing, on account of the great overhanging weight carried by it. This platform projects back 7 ft. 9¾ ins., and from the centre of the back truck to the rear of the platform is over 13 ft. This platform construction would seem to be abnormally large, but is considered advisable for the P-A-Y-E system of fare collection. The design here developed is on the assumption of it being possible to concentrate 30 normal individuals on the extreme rear end of the platform. This condition never existing, the design can readily be seen to be strong enough to meet all requirements. Incidentally it may be mentioned that as light a car construction is not possible with such cars as is practicable on cars with shorter vestibules, owing to the heavy reinforcing necessitated.

The back vestibule is carried on a rather ingeniously designed arrangement of channels in the manner indicated, two 4-in. at 6 lbs. being used on each side. As shown in the sectional view, a 10-in. 25 lb. piece of I-beam acts as a separator directly under the end of the car body end Z-bar, with lighter separators at other places. Extra metal had to be introduced into these overhanging beams, on account of the side offset, to allow for the car steps being inside the outside clearance line. This arrangement, it will be noted, has been well designed, resulting in not only a substantial but clean-cut design. A rear-end bumper, built up of channels and plates, is carried on these overhanging beams. Intervening 6-in. 10-lb. channel beams, as at the front, support the floor.

BODY BOLSTER.—The design of body bolster is rather ingenious, from the fact that the arrangement permits of a very low setting of the car body for a given height of truck. The design is illustrated in the accompanying drawing, fig. 4. As will be noticed, it is constructed of two lengths of channel steel, the upper 12 ins. at 20.5 lbs., and the lower 10 ins. at 20 lbs. Both are placed web upwards. The advantage of such an arrangement is that the upper surface may be brought as close as practicable to the car floor, while the truck bolster centre fits up between the flanges of the lower channel, making the distance between truck bolster and floor a minimum, for a maximum distance of the centres of gravity of the channel sections. This is readily seen from an inspection of the drawing. Such a design of body bolster is a decided improvement on existing patterns for this reason.

The centres of the channels are separated by two short pieces of 8-in. channel sections in the manner indicated. The end connections are made by rivetting the webs together with twenty ¾ in. rivets, which is amply sufficient to withstand horizontal shear.

The construction of sidebearing plates is indicated in the cross-sectional view of a-b. A flanged piece serves the double purpose of distance piece between compression and tension member of the bolster, the flange securing the circular bearing surface. A Z-bar between the flanges of the lower channel provide additional stiffness to the bearing surface.

Instead of the car body being built up on longitudinal sills supported at intervals across the body bolster, the body frame is made in one unit as previously described, and illustrated in fig. 3, this completed unit being attached to the body bolster by the heavy ship channels along the sides in the manner shown by the dotted channel in fig. 4. The floor and end strengthening beams of the body frame are clear of the body bolster, as shown, the whole weight being carried directly from the built-up plate girder on to the ends of the body bolster. The advantage of such a construction lies in the fact that the floor being unsupported from the body bolster, which is carried on the truck bolster, is freed from the vibration that the truck would otherwise transmit. The life of the floor is thereby increased, and the comfort of the passenger provided for.

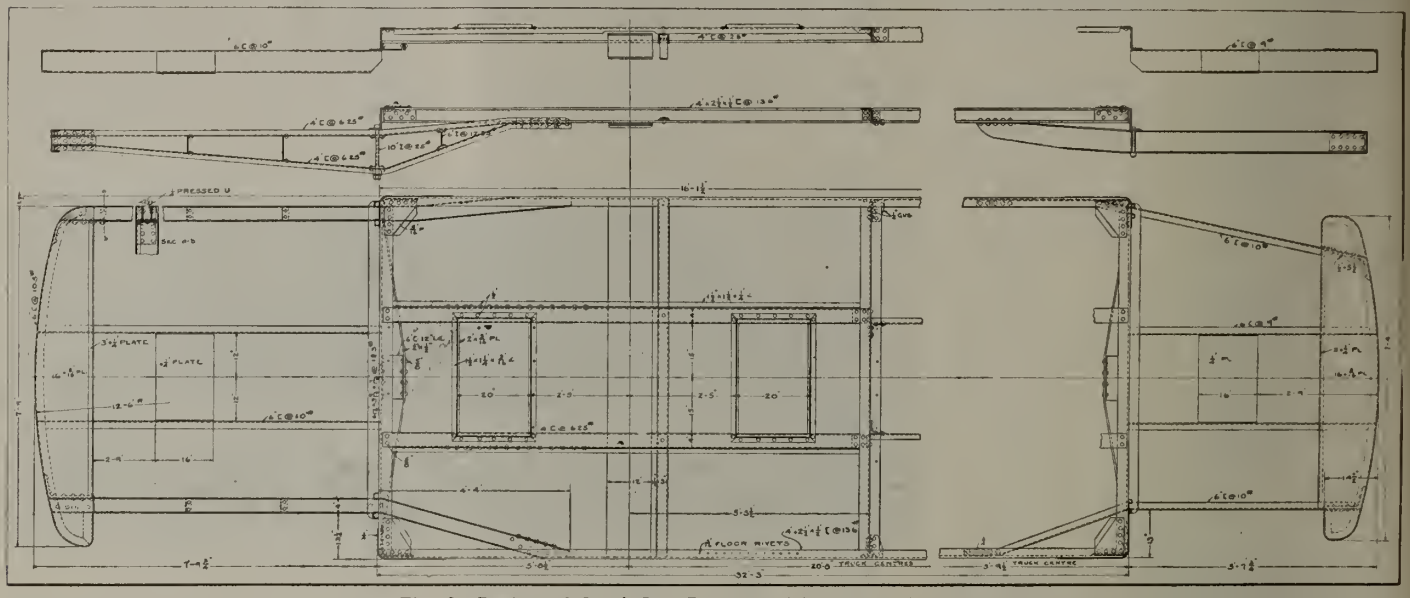


Fig. 3—Design of Steel Car Frame and Vestibule Construction.

The construction of the cross floor beams or needle beams shown in the frame illustration, fig. 3, is shown to better advantage in fig. 2. The construction of these needle beams is quite similar to that of the body bolster, only the lower member is a plain 2¾ x ¼ in. plate strap, the forces acting being reversed. The upper member is a 3-in. channel at 4 lbs. This beam is supported on the lower flange of the body ship channel, the longitudinal floor beams resting on the upper surface of the needle beam.

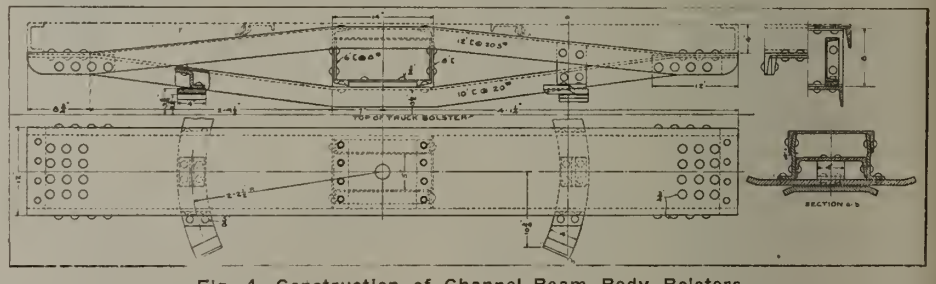


Fig. 4—Construction of Channel-Beam Body Bolsters.

BODY CONSTRUCTION.—The first point to be considered in the body construction is the design of posts and belt rail. Two cross-sectional views of the body are shown in fig. 5, while fig. 6 shows some of the more important details on a larger scale.

A casual glance at the three sections to the left in fig. 6 will suffice to emphasize the fact that the wall construction is unusually thin—only 3 7-16 ins., giving a clear inside width of 7 ft. 8½ ins., which is somewhat more than is ordinarily found in cars of similar outside dimensions. To obtain this extra width, very careful design was required.

The weak point usually occurs at the juncture of posts and belt rail, both these members requiring to be recessed in order that they may fit into each other with flush surfaces. This weak point usually necessitates much heavier members in order that the place may be of sufficient strength. A simple modification has here been introduced to make

the post and belt rail construction not only thinner but stronger than usual. The belt rail is recessed on its inner face, similar cut-outs on the outer face of the posts fitting into them. These recesses make the belt rail weak on its inner face, and the posts, on their outer face.

tached by wood screws through holes in the brass-rod fittings, engaging the window sash from the inside, drawing the sash inward. No objectionable and unsightly screw holes are thus left visible when the double windows are removed for summer service. Special precautions

This is clearly objectionable, for from the long unsupported length, unless unduly strong, it will tend to sag at the centre from its own weight. Consequently, in this design, no beam construction has been attempted, the whole weight of clerestory and roof being supported on

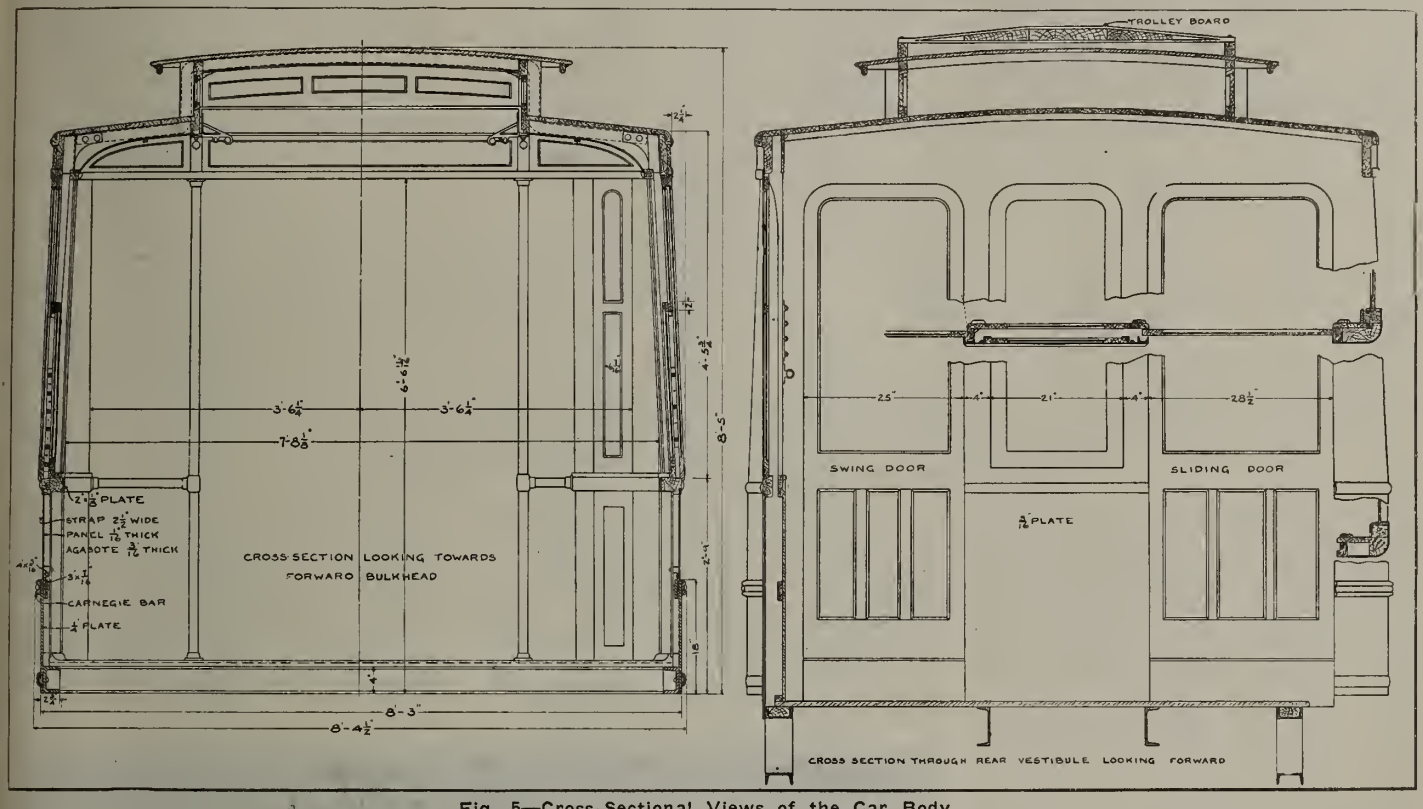


Fig. 5—Cross-Sectional Views of the Car Body.

To strengthen the belt rail, a ⅛-in. steel band shown under the wooden strip on the left face of the belt rail in "section of window sill," is attached to the rail belt by screws the full length of the car. The belt rail thus becomes a built up girder, the uncut wooden section forming one member, and the steel strip the other, the resulting beam being stronger than the original wooden rail, as the centres of gravity of the beam members are now further apart. A similar method of strengthening the vertical post is resorted to. A rolled section of shape shown on the right face of the post in "section of vertical post above girder plate," is fastened to the post by screws from the girder plate to roof, resulting in a stronger built-up post than the original wooden one. This is also shown in the upper section. The belt rail thus reinforced will stand a very heavy bending moment.

The design of the vertical posts is simplicity itself. Instead of an ornamented post of varying section throughout its length, a rectangular uniform section is used. Ornamentation is supplied by the attached strips shown in the sections through sashes in the upper left-hand corner of fig. 6. These strips serve the double purpose of guides and décoration, for while extremely plain, their neat lines present an ornamental appearance.

The inner windows are made in two sashes, the upper one of which is stationary. The lower one is opened by raising up into an opening in the upper part of the car, shown in "roof corner details." Double windows, which are also provided, are secured in an excellent manner. As shown in the sections showing "roof corner details," the top of this outer window fits under a holding-in strip. The lower end, instead of being secured by wood screws from the outside screwed into the vertical post, are at-

have been taken that these outer windows fit snugly, for when the intervening space is made air tight, no trouble will be experienced from frosted windows.

the carlines. Protection is provided against the weather at the point at which the carline vertically enters the roof, by encasing the exposed section

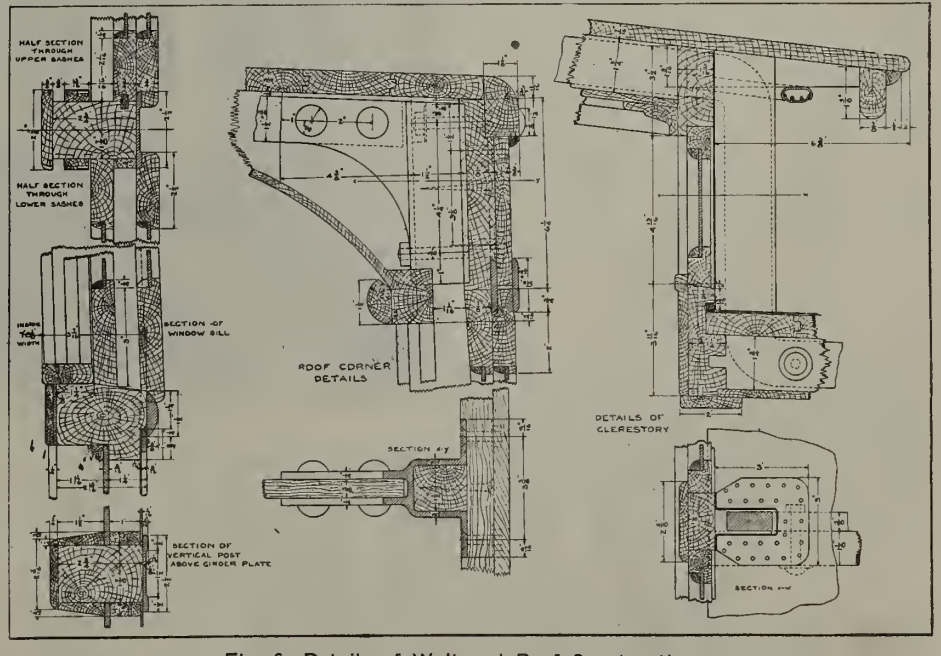


Fig. 6—Details of Wall and Roof Construction.

The roof structure is supported on carlines bolted to malleable castings on the heads of the vertical posts, the construction being clearly outlined in the sections in fig. 6. It is customary to construct the roof members on which the clerestory rests, from a heavy beam extending from end to end of the car body.

with sheet metal, and rivetting both top and bottom to the clerestory and roof.

The trolley support is indicated in fig. 5. The whole weight is carried over to the clerestory walls by a trolley board, instead of being supported directly on the clerestory roof. The latter construction is decidedly undesirable from the

thundering noise it creates in the car by the trolley vibration being carried down on to the vibratory roof of the clerestory.

The inner wall of the car between floor and belt rail is lined with 3-16-in. agasote, as indicated both in fig. 5, and the lower left-hand section of fig. 6. The post below the belt rail is encased in the manner indicated in this latter section.

As mentioned earlier in this article, the lower part of the car is well protected against side swipes and knocks on account of the heavy ¼-in. plate construction. Between the top of the plate and the belt rail, there is a zone that while freer from injurious blows than the lower zone, is yet liable to a certain degree of injury. It not being considered advisable to have this section made of heavy plate, a design that called for easily replaceable plates was worked up. Referring to the photograph, fig. 1, it will be noticed that each of the small panels above the girder plate are separate sections of 1-16-in. plate. Reference to the two lower left-hand sections of fig. 6 shows the detail construction. In the lower sections, it will be noticed that this 1-16-in. plate is held at the sides under the edges of the vertical reinforcing strip. To put into place, the thin section is buckled up and slipped under these edges. Referring next to the vertical "section of window sill," the plate is held in position by a rectangular bar slipped up under the outer ornamental band of half-round iron. This rectangular bar is held on by round-head screws. The lower edge of the sheet is secured in place by wood screws through the upper projecting strip shown at the top of the plate girder, fig. 4. These sections it is purposed to keep in stock, all painted, so that in the event of one or more sections being crushed in, all that is necessary is to unscrew the lower row of screws, unscrew and draw down the upper retaining strip, buckle up the plate, which can then be removed. Reversing the operation replaces the damaged plate with one all finished for service. The car is thus only kept out of service the length of time required to replace the damaged section.

The car floor is built up in layers. A sheeting of corrugated iron, rivetted to the floor beams, is covered by a layer of sawdust and magnesite composition. This, strong, flexible, and a good heat insulator is covered with special rubber carpet the size of the car floor, laid in on completion of the composition setting. This composition floor is in line with modern steel car construction.

INTERIOR ARRANGEMENT.—The interior layout of this car is shown in the plan view, fig. 7, and the photograph of the forward end of the car, fig. 8. In the earlier designs of cross-seated cars, this company had cross-seats right up to the front door. Each design since that time has had a gradually decreasing number, the present design calling for only 10 such seats, the balance of space being occupied by longitudinal side seats. The cross-seats used this time are of a new design, rattan seats and backs carried on a pressed-steel frame, the seat complete only weighing 35 lbs.

The rear vestibule arrangement is the same as heretofore used, a large platform being required for the P-A-Y-E system. The rear rail is to separate the platform standers from those entering, while behind the other rail, the conductor stands. Entrance is through a swinging door, and the rear exit through a sliding door, as shown in fig. 5.

The front vestibule embodies a number of changes on former designs. As before, bulkhead partitions are dispensed with, vertical pipes as indicated, serving a similar purpose of end supports for standing passengers. The motorman is in a partitioned-off section where he cannot be disturbed by passengers. The exit is at the front of the vestibule, instead of at the rear, as heretofore. A swing door, replacing the former sliding door, is operated by a lever located alongside of the motorman's air handle, the door being mounted on a vertical rod, the lower end of which, under the car floor, is connected to the lever rod just mentioned. The lower rod is so located that on shutting, the rods lock just over the centre of their travel, and so cannot swing open. To provide for a tight, non-rattling door fit, the latter is slightly sprung outward at the top, the closing pressure holding it snugly closed against this spring.

These doors have another point of interest, in the fact that the lower panels are glazed, so that the motorman may observe the movements of the passenger on alighting, and be sure the latter is clear before moving. This is a feature being introduced into most cars that have been recently built.

TRUCKS AND EQUIPMENT.—The trucks are Brill type 27G, each equipped with two Westinghouse 101 motors. Westinghouse straight air system of braking is used, a type D1E motor-compressor supplying the air.

Ventilation is obtained by an exhaust ventilator. Provision is made for the entry of fresh air by placing small tubes through the floor directly beneath the electric heaters attached to each seat. Fresh air is then drawn through the floor and heated, the foul air being carried away by the ventilators in the deck sash.

As before mentioned, the weight of car body is reduced to such a degree that lighter trucks are possible. This is but one step toward the end desired by certain car builders. Makers of equipment have not seen the need of reducing the weights of the parts they supply, and consequently but little reduction was possible in these parts on this series of cars. A step is now being made by the motor manufacturers to build a lighter motor, weighing about 1,000 lbs. less. This, in a four-motor car such as the one under discussion, will mean a saving of no less than 4,000 lbs. Similar savings are to be expected in other parts when similar careful analysis of the design is dealt with.

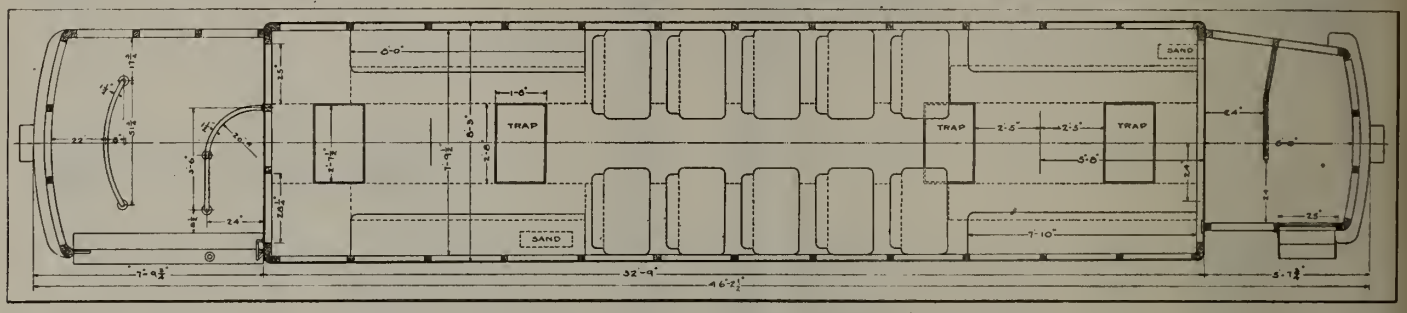


Fig. 7—Layout of Car Showing Seating and Vestibule Arrangement.

Fig. 8—Front Interior Arrangement of Car.

Lake Erie and Northern Ry.—A director is reported to have stated that the right of way between Brantford and Port Dover has all been secured. Brantford city council has given the right for an entrance to the city terminating at the old Great Western Ry. station. It is said that certain municipalities will now be applied to for a guarantee of bonds.

The Hamilton Street Ry., press reports state, has ordered six trucks of the 27 G.I. type.

The Ottawa Electric Ry. has ordered 15 steel body, pay-as-you-enter cars from the Ottawa Car Co., Ottawa, Ont.

The Calgary Municipal Ry. has received four single truck city cars from the Preston Car and Coach Co., Preston, Ont.

Electric Railway Statistics for Year Ended June 30, 1911

The following abbreviations are used in the names of railways—E., electric; E.R., electric railway; E.S.R., electric street railway; Ry., railway; S.R., street railway. The minus mark (—) in the column for net income or deficit, shows that there was a deficit in the operation of the line to the extent of the figures given.

Name of Railway	Mileage	Gross Earnings	Operating Expenses	Miscellaneous Income	Taxes, Interest, etc	Net Income or Deficit	Total Car Mileage	Fare Passengers Carried
Berlin & Waterloo S.R	3.20	$ 34,552	$ 23,987		$ 6,636	$ 3,928	92,134	714,730
Berlin & Bridgeport Ry	2.30	7,274	5.767		997	509	32,000	145,587
Brantford & Hamilton E.R	23.00	115,904	77,878		62,441	—24,415	330,667	426,246
British Columbia E.R	182.6	2,710,150	1,866,379			843,771	8,079,224	46,541,448
Calgary Municipal Ry	18.00	275,434	139,601		23,220	112,612	801,086	6,420,086
Cape Breton E.R	30.52	150,536	91,471	93,054	74,142	77,986	470,394	2,817,761
Chatham, Wallaceburg & L. Erie	38.94	103,282	48,309		32,961	22,012	286,466	340,677
Cornwall S.R	4.00	29,134	22,212			6,921	209,876	371,558
Edmonton Radial Ry	18.86	196,552	180,860		44,025	—28,332	636,705	4,669,928
Galt, Preston & Hespeler S.R	17.81	162,996	91,612	345	6,177	65,551	275,769	994,568
Grand Valley Ry	38.29	87,932	77,076		2,515	8,340	333,417	1,095,488
Guelph Radial Ry	6.00	30,367	23,130			7,237	205,200	668,952
Halifax E. Tramway	5.12	220,800	125,180	150,467	40,913	205,174	908,690	4,972,597
Hamilton & Dundas S.R	7.00	53,497	34,713	2,795	15,099	6,480	115,434	595,896
Hamilton, Grimsby & Beamsville E.R	22.00	119,344	92,386	2	10,247	16,712	347,054	622,915
Hamilton Radial Ry	25.00	152,985	103,206		71,746	—21,967	513,712	1,422,551
Hamilton S.R	22.00	414,434	255,605		68,184	86,645	1,652,498	10,625,054
Hull E. Co	15.03	110,242	92,930	35,586	904	51,993	802,374	1,716,394
International Transit Co	3.68	76,221	38,733		16,610	20,877	314,806	1,650,540
Kingston, Portsmouth & Cataraqui E.R	8.00	32,099	32,025		3,556	—3,482	199,680	776,736
Levis County Ry	10.25	66,656	57,619	474	13,338	—3,826	311,469	1,412,918
London S.R	25.73	265,608	182,643	126	34,823	48,267	1,432,858	7,210,642
London & L. Erie Ry. & Transport. Co	27.50	122,988	77,699	136	35,908	9,445	388,067	637,861
Montreal Park & Island Ry	29.37	387,999	251,245		161,143	—24,388	1,348,157	4,999,336
Montreal S.R	76.67	4,670,827	2,664,148	130,852	577,079	1,560,079	16,117,398	115,445,207
Montreal Terminal Ry	18.22	134,019	122,116		48,693	—38,789	678,643	1,917,795
Montreal & Southern Counties Ry	7.80	84,416	79,445	694	1,586	4,079	215,524	1,050,428
Niagara Falls Park & River Ry	11.91	162,171	81,839	7,303	33,395	54,239	333,195	1,331,645
Niagara, St. Catharines & Toronto Ry	47.76	316,267	207,599		81,091	27,577	823,212	3,226,995
Nipissing Central Ry	5.10	57,672	31,227		546	25,898	138,470	710,395
Oshawa Ry	7.81	83,885	59,475		4,324	20,18[illegible]	58,375	146,579
Ottawa E.R	24.54	787,575	473,170		59,141	255,261	4,171,449	17,787,662
Peterborough Radial Ry	5.10	37,060	28,706		4,132	4,220	255,218	810,124
Pictou County Ry	7.90	48,711	27,569	29,023	35,786	14,378	135,546	1,016,115
Port Arthur & Fort William S.R	22.33	154,072	97,526	2,176	38,771	19,951	654,075	3,407,918
Quebec Ry. Light & Power Co.								
Citadel Division	17.22	351,441	218,217			133,224	1,556,973	7,857,680
Montmorency Division	25.10	176,135	117,264			96,370	360,842	1,340,319
Sandwich, Windsor & Amherstburg Ry	36.06	205,884	105,359	30,045	34,220	58,870	875,040	3,428,634
Sarnia S.R	8.25	45,926	30,904		4,424	10,597	143,990	800,210
Sherbrooke Ry. & P. Co	5.63	40,973	37,243		35,000	—31,305	289,925	727,090
St. John S.R	12.50	191,412	148,266	96,030	51,613	87,561	1,003,454	1,572,930
St. Stephens S.R	7.0	30,596	25,496	1,846	5,532	1,413	183,960	602,839
St. Thomas S.R	7.50	16,343	24,828		2,371	—10,856	281,700	401,196
Sydney & Glace Bay Ry		6,364	32,198	225	11,617	20,052	143,542	1,159,763
Suburban Rapid Transit		59,161	34,052		29,957	—1,848	303,866	980,519
Toronto Ry	54.17	4,590,245	2,315,355		981,596	1,293,292	16,354,791	114,824,464
Toronto Suburban Ry	19.84	63,673	40,946	295	11,248	11,774	234,128	1,235,377
Toronto & York Radial Ry	72.43	424,532	249,607		117,411	57,513	212,084	4,136,794
Windsor, Essex and Lake Shore Rapid Ry	36.16	113,735	71,964		55,286	—13,518	346,966	383,667
Winnipeg S.R	69.50	1,422,260	723,934	1,101,853	380,282	1,419,896	5,453,432	34,937,661
Winnipeg, Selkirk & L. Winnipeg Ry	20.96	80,730	39,231		22,923	18,575	106,920	261,725
Yarmouth S.R	3.00	20,617	16,161		2,246	2,210	98,340	167,175
	1,223.72	$20,356,951	$12,096,134	$1,683,336	$3,352,818	$6,792,067	72,618,806	426,296,792
						—200,732		
						$6,591,335		

Notes to Electric Railway Statistics.

The statistical returns for the operation of the electric railways for the year ended June 30, 1911, are given in somewhat more detail than formerly by the Comptroller of Railway Statistics, J. L. Payne. The accompanying table shows the same information formerly given in these columns in previous years, except that the passenger and freight car mileage has been combined in one column instead of being given separately, and a new column is given showing the miscellaneous income received by the various companies. By deducting the operating expenses from the receipts from operation, the net earnings from operation will be ascertained. Adding the miscellaneous earnings, the corporate income will be ascertained; the next column gives the total deductions from income, and the following column shows the profit or loss.

The various lines carried 111,857,040 transfer passengers, making the total number of passengers carried 538,153,832. Twenty-three of the companies carry freight, the mileage of freight cars for the year being 1,084,678, and the number of tons carried was 2,496,072. Seventeen lines report having 259.74 miles of second track, and there are 103.54 miles of sidings and turnouts, making altogether 1,587.01 miles of track of all kinds laid. Seven companies report as operating over a total of 160.09 miles of leased tracks.

The total length of main track of the electric railways in Canada on June 30, 1911, was 1,224 miles, an increase of 175 miles of first and an increase of 17 miles of second track over the figures for June 30, 1910. The capital liability increased during the year from $102,044,979 to $111,532,347. The total earnings for the year were $20,356,952 and the operating expenses $12,096,134, leaving net earnings from operation $8,260,818. The total number of passengers carried was 426,296,792, against 360,964,876 in the previous year; while 2,496,072 tons of freight were carried. The various railways employed 13,671 persons, to whom $8,559,215 was paid in wages; the comparative figures for 1909-10 being 10,557 employes and $6,316,777 wages paid. During the year 102 persons were killed and 2,670 injured on the various lines, against 109 killed and 2,438 injured in 1909-10.

James Anderson, President, Canadian Street Railway Association, and Manager, Sandwich, Windsor and Amherstburg Ry., has been appointed a member of two of the American Electric Railway Association's committees, viz., public relations and permanent membership. He attended the association's mid-winter meeting in New York recently.

Donald Robertson has been appointed Purchasing Agent, Montreal Tramways Co., succeeding W. A. McNaught.

Ottawa Electric Railway Company's Annual Report.

Following are extracts from the report for the year 1911:—

The gross earnings were $840,680.52, compared with $748,708.75 in 1910. 19,270,521 passengers were carried, compared with 16,967,334 in 1910. The net earnings were $354,691.08, which have been disposed of as follows:—

Interest on bonds and loans	$ 37,031.55
Four quarterly dividends of 2½%, a bonus of 2% and one of 3%, making 15% for the year	187,155.00
Mileage payments	13,667.75
Taxes	8,440.13
Placed to the credit of contingent account to be applied to reduction of track renewal, car equipment and otber accounts	78,000.00
Transferred to credit of profit and loss account	30,396.65
	$354,691.08

The balance at credit of profit and loss account is now $107,355.84, and of rest account $200,000. The business of the company has practically doubled in six years, the passengers carried in 1905 being 9,891,311, and in 1911 19,270,521.

The new power house was completed towards the end of the year, and the storage battery was renewed. 13,492 ft. of light rails were taken up, and relaid with 80 lbs. tee rails. 8,800 ft. of these were laid in permanent pavement of asphalt and stone blocks. Our office accommodation having become too small, and the space being required for other purposes, a lot has been secured on the south side of Albert St. near Bank St., on which it is proposed to build new quarters as soon as can be arranged. With the great development going on in the city your directors look for marked advances in the company's business as the years go on, and, as in the past, the company will endeavor to provide an up-to-date service.

The statistical tables appended to the report show that the percentage of operating expenses to receipts was 57 6-10 per cent., against 63% in 1910.

The directors and officers for the current year are:—President, T. Ahearn; Vice President, W. Y. Soper; other directors—G. P. Brophy, Hon. G. A. Cox, T. Workman, T. F. Ahearn, E. N. Soper. Secretary, J. D. Fraser.

Toronto Railway Co's Annual Report.

Following are extracts from the report for 1911, which was presented at the annual meeting, Feb. 7, over Sir Wm. Mackenzie's signature:

The operations for the year show very gratifying results. The passenger earnings, $4,800,467.48, show an increase of $464,098.43 over 1910. The various charges against these earnings for operation, maintenance, etc., were $2,653,-361.86 or 55.2% of the earnings. The payments made to the city were $822,-233.24, an increase of $94,752.94, or 13.02% over 1910.

Expenditure on capital account was $1,113,867.69 for the year. The different works in progress referred to in the report for 1910 were completed and as a result better car-housing facilities now exist at the Lansdowne Ave. car house, and the rolling stock has been increased by about 100 double-truck cars. Track and overhead construction upon various streets has been completed, which has enabled the company to change the routing of several of its lines, thus relieving some of the congestion upon several of the busy thoroughfares in the downtown districts.

The directors subscribed for and purchased at par 20,000 shares of $100 each of the capital stock of the Toronto Power Co., Ltd., aggregating $2,000,000.

The shareholders on Aug. 14, 1911, authorized an increase in the capital stock by $4,000,000, and there was offered for subscription to the shareholders of record on Aug. 25, 1911, at par, $2,000,000 of the new stock.

Under the mortgage deed dated Sept. 1, 1892, covering the currency and sterling bond issues, the company is obliged to redeem by drawing annually, 5% of the outstanding bonds. The first drawing was for payment on Aug. 31, 1911. The bonds drawn amounted to $168,-693.33, of which there was presented up to Dec. 31, $133,413.33, leaving a balance of $35,280.00 deposited for redeeming the balance.

Careful attention has been paid to the maintenance of the plant, rolling stock equipment and other properties.

The directors declared out of the accumulated surplus earnings a stock bonus dividend of 12½% to shareholders of record at Aug. 25, two quarterly dividends of 1¾% paid Apr. 1 and July 1, and two quarterly dividends of 2% the first paid Oct. 1, 1911, and the second payable Jan. 2, 1912.

The Toronto and York Radial Ry. reports that the earnings continue to show very satisfactory increases—the gross income amounting to $449,059.16, compared with $399,615.69 for 1910, an increase of 12.3%, while the net earnings, after providing for all operation and maintenance charges, bond and loan interest, etc., show a surplus of $63,266.20, an increase over the previous year of $7,268.17.

The Toronto Power Co., Ltd., the capital stock of which is owned either directly or indirectly by the Toronto Ry. Co., purchased during the year over 99% of the $4,000,000 paid up capital stock of the Toronto Electric Light Co., which has for 11 years paid dividends ranging from 7 to 8% on its outstanding capital stock. During the past five years the dividend has been 8%. The company's accumulated surplus is in excess of $1,500,000.

INCOME ACCOUNT.

Gross earnings		$4,851,541.42
Operating, maintenance, etc.	$2,653,361.86	
Interest on bonds, etc.	198,553.69	
Percentage on earnings	687,650.44	
Pavements, taxes	134,582.80	
		3,674,148.79
Surplus earnings		$1,177,392.63

PROFIT AND LOSS ACCOUNT.

Balance from last year		$3,619,660.65
Surplus earnings, after payment of all expenses, interest, taxes, etc.		1,177,392.63
		$4,797,053.28
Dividends:—		
Stock bonus dividend	$1,000,000.00	
Two dividends at 1¾%	280,000.00	
Two dividends at 2%	391,158.95	
		$1,671,158.95
Balance from 1910	$3,619,660.65	
Less stock bonus dividend	1,000,000.00	
	$2,619,660.65	
Surplus for 1911 carried forward	506,233.68	
		3,125,894.33
		$4,797,053.28

COMPARATIVE STATEMENT.

	1911.	1910.
Gross income	$4,851,541.42	$4,377,110.10
Operating, maintenance charges, etc.	2,653,361.86	2,237,187.75
Net earnings	2,198.179.56	2,139,928.44
Passengers carried	120,997,844	109.415,264
Transfers	48,730,671	42,630,756
Percentage of charges, etc., to passenger earnings	55.2	51.6

The officers and directors for the current year are:—President, Sir Wm. Mackenzie; Vice President, F. Nicholls; other directors—Sir Henry M. Pellatt, Sir Rodolphe Forget, Hon. G. A. Cox, W. D. Matthews and James Gunn.

Montreal.—The city council decided Jan. 13 to ask the Quebec Legislature to grant it power to build one or more underground tramways, to be operated by electricity. (Jan., pg. 38.)

London Street Railway Company's Annual Report.

Following are extracts from the report for the year 1911, presented at the annual meeting in London, Ont., Feb. 7:

Earnings:	1910.	1911.
Passengers	$250,897.34	$274,887.95
Miscellaneous	5,381.14	4,718.98
Gross earnings	$256,278.48	$279,606.93
Expenses:		
Maintenance:		
Way and structures	$ 21,736.67	$ 22,325.91
Equipment	25,102.23	30,337.48
Transportation:		
Power plant	$ 31,609.98	$ 35,556.80
Car service	73,851.44	74,985.98
General	29,891.36	29,530.59
Total operating expense	$182,191.68	$192,736.76
Net earnings	$ 74,086.80	$ 86,870.17
Deductions:		
Interest on bonds	$ 28,750.00	$ 28,750.00
Interest on overdraft		93.59
Total deductions	$ 28,750.00	$ 28,843.59
Net income	$ 45,336.80	$ 58,026.58

The reconstruction of the tracks in the down-town district on Dundas St. and on Richmond St., equalling 1.52 miles of single track with 80-lb. T rail in 60-ft. lengths, was completed during the year. This included several large pieces of track special-work, all of which were renewed. At several other places throughout the system, new pieces of special-work, such as curves, switches and crosses were renewed and the tracks generally maintained in good condition.

A new single-truck sweeper was added to the rolling stock, making the maintenance of service during snow-storms very much more reliable.

As a result of the census of 1911, the city is entitled to 1.73 miles of additional track. Various routes and localities have been considered for this new trackage, but no definite agreement has yet been made with the city regarding it. Some of it will be used for double tracking congested sections, and the remainder used in the form of extensions into those portions of the city requiring car service the most, and which should result in greater accommodation to the public.

The gross earnings and surplus for the past year having shown very substantial increases, it has not been necessary to dispose of any more bonds. The substantial increase in earnings of 12% for Dec. and for Jan., 1912, is very gratifying to your directors, who confidently expect the coming year to be the most successful in the history of the company.

PROFIT AND LOSS ACCOUNT.

Surplus, Jan. 1, 1911	$37,536.06
Unclaimed wages, etc.	72.81
Net income for year	58,026.58
	$95,635.45
Dividends, July 2, 1911, and Jan. 2, 1912, 3 per cent. each	$33,120.00
Directors' and auditors' fees	1,420.00
Grant to late secretary's relatives	634.12
Surplus	60,461.33
	$95,635.45

Statistics: Expenses, per cent. of earnings, 68.9; net income, per cent. of capital, 10.51; passengers carried, 7,582,-120; car earnings per revenue passenger, 3.67c.; transfers, 1,178.88; total passengers, 8,761,005; car earnings per passenger, 3.13c.; car mileage, 1,440,611; gross earnings per car mile, 19.10c.; operating expenses per car mile, 13.37c.; net earnings per car mile, 6.03c.; number of miles of track, 33.25; gross earnings per mile of track, $8,409.23.

There are 33.25 miles of single track, covering about 26 miles of territory, 20.08 in the city and 5.2 outside.

It was finally decided not to use hydro power from Niagara, but to extend the company's steam plant. An addition of 80 x 40 ft. will be built to the power house. Three modern boilers, 300 h.p. each, will be added to the present six return tubular boilers of 150 h.p. each and a 750 or 1,000 k.w. generator will be

added to the present equipment, which consists of one 400 k.w. direct connected generator and six old Edison 80 k.w. generators.

The board as re-elected for the current year is: President, H. A. Everett, Cleveland, Ohio; Vice President, T. H. Smallman, London; other directors, H. S. Holt, Montreal; E. M. Moore, Cleveland; W. M. Spencer and C. H. Ivey, London. The Manager is C. B. King and the Secretary-Treasurer, J. H. Williams.

Electric Railway Finance, Meetings, Etc.

Brantford St. Ry—The moveable chattels of the Brantford St. Ry., except those used as public utilities, were seized on Feb. 10 for unpaid taxes.

British Columbia Electric Ry.—Gross earnings for Dec., 1911, $523,003; operating expenses, $319,298; net operating earnings, $203,705; renewal funds, $37,935; net earnings, $165,770; approximate income from investments, $25,000; net income, $190,770, against $389,234 gross earnings; $224,549 operating expenses; $164,685 net operating earnings; $25,417 renewal funds; $139,268 net earnings; $20,000 approximate income from investments; $159,268 net income, for Dec., 1910. Aggregate gross earnings for six months ended Dec. 31, 1911, $2,801,394; net earnings, $979,187, against $1,991,648 aggregate gross earnings, and $829,896 net earnings for same period 1910.

An issue of £800,000 4¼% perpetual guaranteed debenture stock of the Vancouver Power Co., was recently placed on the London, Eng., market at 96%. The stock is guaranteed unconditionally both as to principal and interest by the British Columbia Electric Ry. Co., which owns all the issued share capital of the V.P. Co., amounting to $7,000,000. The B.C.E.R. Co. was incorporated in 1897 and has an issued capital of £3,000,000 divided equally into preference, preferred ordinary and deferred ordinary stock, quoted on the exchange at the end of 1911, at 110, 112 and 139½ respectively. The company's operations are carried on in Victoria, Vancouver, North Vancouver, New Westminster, Steveston and Chilliwack, and it operates 232 miles of fully equipped electric railway, in addition to its lighting and power systems. The company's power is generated by the Vancouver Power Co., the waters of Lakes Buntzen and Coquitlam being utilized for the purpose. The power house is about 16 miles from Vancouver and 11 from New Westminster. The B.C.E.R. Co. has a steam power plant in reserve.

The estimated earnings for the year ending June 30, 1912, are £484,042, and the estimated London charges and capital amortization charge are £25,000. The amount required to pay interest on the bonds and debentures at present outstanding is £101.457, to which may be added the interest on the present issue of stock, leaving an estimated surplus of £323,585 available for renewals, maintenance, dividends, etc. The accumulated reserves total £337,000.

Calgary Municipal Ry.—Following are particulars of operation for January:—Earnings, 1912, $37,575.90; 1911, $19,878.82; operating expenses, 1912, $23,370.98; 1911, $13.409.86; net profits after crediting 5% of gross receipts to contingent account and providing for interest and sinking fund, 1912, $7,062.80; 1911, $2.759.14; revenue per car mile, 27.752c, operating expenses per car mile, 17.261c; gross profit per car mile, 10.491c; cost of power per car mile, 3.265c; proportion operating expenses to revenue, 62.1%.

Cape Breton Electric Co.—Gross earnings for Dec.. 1911, $31,417.93; operating expenses, $15,187.38; net earnings, $16,230.55; interest and taxes, $5,123.33; balance, $11,107.22; sinking and improvement funds, $1,140; net income, $9,967.22, against $29,519.63 gross earnings; $14,194.45 operating expenses; $15,335.18 net earnings; $5,051.29 interest charges and taxes; $10,283.89 balance; $1,141.68 sinking and improvement funds; $9,142.21 net income for Dec., 1910. Aggregate gross earnings for year ended Dec. 31, 1911, $337,554.88; net earnings, $161,923.73; fixed charges, $73,962.61; net income, $87,961.12, against $326,010.11 aggregate gross earnings; $155,822.88 net earnings; $73,834.88 fixed charges; $81,988 net income for same period 1910. During 1911 the construction charges were $81,185.95, against $10,394.30 in 1910. The assets total $2,907,636.34, and the liabilities, including Sydney and Glace Bay Ry. bonds $195,000, total $2,503,978.26, the balance of $403,658.08 constituting sinking and improvement funds, replacement reserve and surplus.

Edmonton Radial Ry.—The accounts of the city of Edmonton, Alta., for the year ended Oct. 31, 1911, issued Feb. 1, contain the accounts of the Street Railway Department, which manages the E.R. Ry. The gross earnings were $245,264.64, from which is deducted $763 on account of outstanding tickets, making the net earnings, $244,501.64; interest on unexpended balances brings this up to $250,514.84. The expenditure includes:—Operation, $165,606.65; maintenance, $34.540.38; management, $40,357.92; interest and redemption, $64,636.04; special charges, $4,190.92; total, $285,340.94. This shows a deficit of $34,826.07. The returns for the year ended Oct. 31, 1910, showed a deficit of $29,269.74, on receipts of $147,287.39, and expenditures of $176,557.43. The capital account shows that there have been issued $980,446.66 of debentures on account of the lines, of which $11,642.23 have been redeemed, leaving $968,804.43 outstanding.

Halifax Electric Tramway.—Railway receipts for Jan., $17,772.99, against $16,380.69 for Jan., 1911.

Hamilton St. Ry.—The earnings for 1911 were $454,010.52, an increase of $75,000.18 over 1910. The city's percentage for the year was $36,320.84, an increase of about 20%.

International Ry. Co.—The question of the local fare at Niagara Falls, Ont., between the upper and lower bridges, which has been in dispute for some time, has been settled by the company reducing it from 10c to 5c, and this reduction has been approved by the Queen Victoria Park Commissioners and the Ontario Railway and Municipal Board, the Court of Appeal has decided that these bodies have joint jurisdiction. The company has refused to reduce the fare from the lower bridge to the Dufferin Islands to 5c.

Montreal Tramways Co.—The amalgamation of the Montreal Tramways Co. and the Canadian Light and Power Co. will, it is said, be effected by a holding company taking up the common stock of the two companies to be absorbed. The holding company will be the Montreal Tramways and Power Co., with a London, Eng., charter, and a capital of $20,000,000. The shareholders of the Montreal Tramways Co. and the Canadian Light and Power Co. will receive 1½ shares of the Montreal Tramways and Power Co. for each share now held by them. The holders of $2,000,000 of common stock of the Montreal Tramways Co. will receive $3,000,000 stock of the consolidated company, and the holders of the outstanding $6,000,000 of Canadian Light and Power Co. will receive $9,000,000 stock of the consolidated company. The Montreal Tramways and Power Co.'s outstanding stock will, therefore, be $12,000,000 of the $20,000,000 authorized.

Ottawa Electric Ry.—Press reports state that the directors have arranged to issue $600,000 of the unissued stock of the company to the existing shareholders, at par, in the proportion of one share of the new stock to every two shares now held.

Regina Municipal Ry.—The street railway committee of the Regina, Sask., Municipal Ry. had before it, Jan. 30, the Superintendent's estimates for the current financial year. He estimated the necessary expenditures for operation at $102,700, and the probable receipts at $155,000.

St. Thomas Street Ry.—The report of operations for the year 1911 was laid before the street railway committee of the St. Thomas, Ont., city council Feb. 2. The passenger receipts were $9,435.55, and miscellaneous receipts, including $1,413.86 from the London and Lake Erie Ry. and Transportation Co., $2,361.83, a total income of $11,797.38. The total expenditures were $28,412.57, the deficit on operation being $10,357.48 against $12,944.44 in 1910.

Sherbrooke Ry. and Power Co.—The gross receipts for the six months ended Dec. 31, 1911, were $44,800.81, and operating expenses $25,945.73. After meeting bond interest and general expenses there was a surplus of $2,371.31, which is carried to the credit of profit and loss account, which now stands at $6,065.77. The company's properties are valued at about $2,000,000. The new power plant and transmission line were put in operation during Feb.

Winnipeg Electric Ry.—Gross earnings for Dec., 1911, $319.900; operating expenses, $169,121; net earnings, $150,779, against $340,281 gross earnings; $177,754 operating expenses; $162,527 net earnings for Dec., 1910. Aggregate gross earnings for 12 months ended Dec., 31, 1911, $3,829,749; net earnings, $1,928,782, against $3,284,341 aggregate gross earnings; $1,629,508 net earnings for same period 1910.

Winnipeg Electric Railway Sustained by the Privy Council.

The Imperial Privy Council, London, Eng., gave judgment, Feb. 21, in the appeals of the Winnipeg city council and of the Winnipeg Electric Ry. Co. against the Canadian decisions in the action brought by the council to have the company's poles and lines for the supply of light and power removed from the streets on the ground that no franchise existed, and that the company was not manufacturing power within the city as provided. The W.E. Ry. Co. has absorbed a number of other concerns, each of them having franchises in the city. It had been held that the amalgamations had not been technically completed in every case, but the Privy Council decided that the city had acquiesced, by having from time to time given permission for the erection of poles and the stringing of wires in the city. It was also decided that the erection and maintenance of transformer stations and plants for the distribution of power within the city was a substantial fulfilment of the condition requiring the manufacture of power in the city. The decision went so far as to find that there was nothing in the agreements forbidding or restricting the importation of power from outside the city bounds. The appeal of the company was allowed, and that of the city was dismissed with costs.

J. L. Englehart, Chairman, Temiskaming and Northern Ontario Ry. Commission, is reported to have announced at Cobalt, Feb. 23, that a passenger service will be started to Timmins, on the Porcupine branch, March 11.

Sandwich, Windsor and Amherstburg Railway.

The annual report of the Detroit United Ry. Co. for 1911 covers all the subsidiary companies, including the Sandwich, Windsor and Amherstburg Ry., of which the following particulars are given:—Mileage, 36.636; funded debt, $35,260.66; revenue passengers, 3,543,765; transfer passengers, 487,255; employe passengers. 23,828; receipts per revenue passenger, 0.0542c.; receipts per passenger, 0.0473c.; car mileage, 911,109; earnings per car mile, 0.2188c.; expenses per car mile, 0.1096c.; net earnings per car mile, 0.1092c.; expenditure on extension of lighting plant, new track and purchase of six cars, $45,056.64. In the D.U.R. balance sheet, under investments, the S.W. & A. Ry. is given as $253,134.91, and under accounts current as $257,732.11.

BALANCE SHEET, SANDWICH, WINDSOR AND AMHERSTBURG RY.

Capital stock		$ 297,000.00
Mortgage bonds		490,000.00
Accrued interest on bonds		4,987.50
Detroit United Ry.		257,732.11
Accounts payable		1,253.94
Injuries and damages reserve		1,766.70
Insurance reserve		868.26
Unredeemed tickets		3,437.80
Profit and loss		18,096.56
Investment	$1,045,113.78	
W. & T.E. Ry. Co. (stock)	10,000.00	
W. & T.E. Ry. Co.	17,009.18	
Accounts receivable	802.38	
Stores	1,395.02	
Cash	822.51	
	$1,075,142.87	$1,075,142.87

BALANCE SHEET, WINDSOR AND TECUMSEH ELECTRIC RY. CO.

Capital stock		$ 100,000.00
Mortgage bonds		189,000.00
Sandwich, Windsor and Amherstburg Ry.		17,009.18
Investment	$ 306,009.18	
	$ 306,009.18	$ 306,009.18

The earnings and expenses of the Windsor and Tecumseh Electric Ry. are included in the operations of the S., W. and A Ry., which latter owns all of the capital stock of the W. and T.E.R.

Dominion Power and Transmission Co's Annual Report

This company, which includes among its properties five electric lines, the Hamilton St. Ry., Hamilton Radial Ry., Hamilton and Dundas Ry., Hamilton, Grimsby and Beamsville Electric Ry., and Hamilton and Brantford Ry., held its annual meeting in Hamilton, Ont., Feb. 19. The statements presented show the combined results of operations of the various subsidiary companies, power, light and railway, and do not give any separate information as to the operations of the railway lines. This information, up to June 30, 1911, will, however, be found in the general electric railway statistics on another page of this issue.

The directors' report said:—"Much was done in the betterment of the Hamilton St. Ry. tracks, and its rolling stock was largely improved and added to. The power plant for the street railway was increased by 50%. These improvements, while costly, are well made and well warranted. Three cars were added to the interurban equipment and three more have been ordered."

The President, in moving the adoption of the report, said:—"During the past three years over 60% of the Hamilton St. Ry. tracks have been reconstructed in a very thorough and substantial way, while the rolling stock has been added to and greatly improved, and probably during the present year a new car per month will have to be added, while some additions will also be made to the rolling stock of the suburban lines. The addition of two new units in the power-house at Power Glen—7,500 h.p. each—enables the company to take on further considerable blocks of power and to feel amply prepared for any increasing demands on railway business."

Reference was made to the payment of dividend 19, one of the arrears of preference cumulative dividends. One or two shareholders objected to certain dividends having been diverted to pay for street railway improvements, but the directors' action was overwhelmingly endorsed.

The following directors were re-elected:—J. R. Moodie, President; J. Dixon, J. Knox. W. C. Hawkins, Sir John M. Gibson, J. Sutherland, Lloyd Harris and W. Southam. The vacancy caused by S. O. Greening's death will be filled later.

Operating Rules for Interurban and Suburban Electric Railways.

A special committee of the Canadian Street Railway Association, which has for some time past, at the Board of Railway Commissioners' request, had under consideration the question of uniform operating rules for interurban and suburban railways, met in Ottawa Feb. 16, those present being J. Anderson, Manager, Sandwich, Windsor and Amherstburg Ry.; P. Dubee, Secretary, Montreal Tramways Co.; E. P. Coleman, Manager of Railways, Dominion Power and Transmission Co.; G: Gordon Gale, General Superintendent, Hull Electric Co.; J. E. Hutcheson, Superintendent, Ottawa Electric Ry.; A. Eastman, General Manager, Windsor, Essex and Lake Shore Rapid Ry.; W. R. Robertson, Superintendent, Niagara, St. Catharines and Toronto Ry.; and Acton Burrows, Managing Director, Railway and Marine World, Secretary-Treasurer of the Association.

A long conference was held with A. J. Nixon, Chief Operating Officer, Board of Railway Commissioners, who was accompanied by J. Murphy, Electrical Expert, and J. Ogilvie, Inspector of Equipment, on the Board's staff.

In view of the great differences in local conditions it was found to be most difficult to frame rules which would be generally adaptable, and it was finally decided that each company under the Board's jurisdiction should submit its rules for separate approval.

The members of the committee were entertained at luncheon at the Ottawa Golf Club by G. Gordon Gale, General Superintendent, Hull Electric Co., traveling to and fro in the company's private car.

Electric Railway Employes' Hours of Labor in Ontario.

Sir James Whitney has introduced a bill in the Ontario Legislature to amend the Ontario Railway and Municipal Board Act by adding the following clauses:—

"The board may regulate the hours during which conductors, motormen, or other employes of a street railway company may be required or permitted to work

"The power conferred by subsection 1 may be exercised, notwithstanding the provisions of any agreement between a municipal corporation and a railway company as to hours of labor.

"Every company and every director, superintendent, manager or officer of a company who contravenes the provisions of any order of the board made under the authority of subsec. 1 shall for each contravention incur a penalty of not less than $10 and not more than $50 recoverable under the Ontario Summary Convictions Act."

Street Railway Track Construction in Toronto.

In his presidential address at the Canadian Society of Civil Engineers' annual meeting in Montreal recently, C. H. Rust, City Engineer of Toronto, said: "The construction of street railway tracks in city streets is a work involving many difficulties. Experience in Toronto has shown that T-rails, weighing from 70 to 80 lbs., and grooved girder rails, weighing from 90 to 100 lbs., are the most satisfactory. T-rails are used on residential streets and in the outskirts, but the heavy grooved girder type of rail is used upon streets subjected to heavy traffic. The rails are laid upon steel ties, 6 ft. centres, with suspended joints. Under the whole of the track allowance pavement for about a width of 18 ft., a concrete foundation 12 ins. in depth is used. This is increased to 18 ins. at intersections. The city of Toronto has been experimenting this year with wooden ties, having 2 ft. centres, to ascertain if the vibration and noise caused by the use of the rigid type of construction necessarily involved by the steel ties could not be got rid of."

Ottawa Electric Railway Advances Wages.

J. E. Hutcheson, Superintendent, Ottawa Electric Ry. Co., announced recently a voluntary increase of wages of conductors and motormen, dating from Jan. 1. First year men now receive 20c, second year men 21c, and those in the service over two years 23c an hour for week days, with 2c an hour advance on above rates for Sunday work. In addition to this all men get free transportation and those in the service over one year receive two suits of uniform clothing each year free. First year men pay half cost of such uniforms. The company provides special cars to bring the men to work in the early morning, and also to take them home at midnight. Following are extracts from the bulletin announcing the advance:—

Regular men will only be booked to work alternate Sundays without their consent. They will, however, be expected to work when booked, unless given leave of absence. Spare men will be expected to work every Sunday if required. If leave of absence is desired, application must be made to the inspector on duty.

The rates for work on snow sweepers and plows are:—From 6 a.m. to 12 midnight, 23½c an hour; from 12 midnight to 6 a.m., 25c an hour.

The hours of work for regular men remain as before, 10 hours constituting a day's work, or as near 10 hours as the schedule of runs will permit. Men will not be required to work beyond the full day of 10 hours unless they wish to do so, except in cases of absolute necessity.

Snow on the Hull Electric Co.'s Ry.—G. Gordon Gale, General Superintendent, Hull Electric Co., Deschenes, Que., writes in reference to snow clearing:—"We have 8.6 miles city track and 16.2 miles of private right of way in use during the winter months. In the city we keep the full width of the street clear of snow. The tracks are cleared by means of single-truck sweepers of the standard design, and the roadway is cleared by a double-truck, double-end, double-side-wing plough, built by the Ottawa Car Company. The private right of way is cleared of snow by a double-end, right-hand, double-truck snow plough. Our snow expenses amount to about $50 per inch of snow fall, or an average of approximately $2 per inch of snow fall per mile."

Electric Railway Projects, Construction, Betterments, Etc.

Alberta Electric Ry.—We are officially advised that progress with the organization of this company, the title of which it is proposed to alter to the Alberta Interurban Ry., has been somewhat delayed owing to legal technicalities. It is stated that these matters have now been arranged, and that the organization work is being proceeded with. (Jan., pg. 38.)

Aroostook Valley Rd.—U.S. press dispatches state that the Maine Railroad Commissioners have approved the company's plans for the extension of its line to Sweden, Me. This relates to the line already built between Washburn and Sweden, Me. This is the line which is to be connected with the St. John Valley Ry. in New Brunswick, to form part of the through line between St. John, N.B., and Quebec, to be known as the St. John and Quebec Ry. (See St. John and Quebec Ry., Feb., pg. 62.)

Bassano Electric Power and Traction Co.—The proposed electric railway from Bassano, Alta., to the C.P.R. irrigation dam, a distance of about five miles, is to be built by a company being organized under a provincial act, with the title of the Bassano Electric Power, Light and Traction Co. The provisional organization has the title of the Bassano Power and Electric Co., to which the municipality has, under a bylaw, granted a franchise for the building of the railway, as well as for the supply of light within the municipality. We have been advised that it was expected to be able to supply light in the town early in March. S. E. Whiting, mayor of Bassano, is President of the company, and among those associated with the company are F. D. Murchison, Bassano, and W. H. McLaws, of Lougheed, Bennett and Co., solicitors, Calgary.

We have been further advised that the franchise for building an electric railway from Bassano to the C.P.R. irrigation dam was originally granted to a company in which S. E. Whiting, W. J. Robinson, I. W. Shoop, Pegler and Darby, Murchison and Haines and other Bassano men are interested. The Canadian Development Co. of Calgary is also interested. The company proposes to supply power and electric light, as well as to operate the railway. A contract has been let to Gorman, Clancy and Grindley, Ltd., Calgary, which has, as a subsidiary company, the Western Canada Engineering, Construction and Paving Co. S. A. Clancy, the Secretary of both companies, informs us that his firm will build the electric railway for the Bassano Electric Traction Co., and that construction will be started as soon as the frost is out of the ground. The line from Bassano to the C.P.R. irrigation dam will be about 12 miles. It has not been definitely decided whether the line will be operated by electricity or by gasoline cars, but it is probable that electricity will be used. The 50 ft. double end type of car, provided with smoking and baggage compartments, will be used. (Jan., pg. 38.)

Berlin and Bridgeport Electric Ry.—The Berlin, Ont., town council passed a resolution, Feb. 19, endorsing the company's proposal to extend the line through Bloomingdale, West Montrose and Winterbourne to Elora. The Ontario Legislature is being asked for power to build this line.

Brandon Electric Ry.—Application is being made to the Manitoba Legislature for an act amending chap. 76 of the statutes of 1911, by authorizing amalgamation with other companies. Mulock, Loftus, Armstrong and Lindsay, Winnipeg, are solicitors for applicants. (See also Brandon, Man., and Wheat City Electric Ry.)

Brandon, Man.—The city council has had under consideration propositions for the building of an electric railway in the city. The latest proposition comes from B. C. Donham, of New York. Other offers came from J. D. McGregor and Col. O'Grady. Mr. McGregor did not renew his proposition, consequently only the other two offers came before the council Jan. 30. The city solicitor suggested the insertion of certain additions to the agreement, and a public meeting was held Feb. 8 to discuss the matter. No decision has been reached. (Feb., pg. 91.)

British Columbia Electric Ry.—The question of the company's franchises in what is known as greater Vancouver continues to be discussed in the various municipalities interested. The franchise bylaw in Point Grey was defeated, and it is stated that the franchises in Hastings and D. L. 301 are void. The Vancouver city council, Feb. 4, appointed a special committee to obtain the views of the company with the object of consolidating the franchises throughout the whole district.

It is reported that the work of building a second track on the Vancouver-New Westminster interurban line will be completed this year. The double track at present ends at Highland Park.

The Saanich extension out of Victoria will terminate at Deep Cove, but press reports state that a branch is to be built to Union Bay. It is also reported that wharves and ferry terminals will be built at Deep Cove, and that a ferry service to the mainland will be established. The construction gangs have reached mileage 18, and it is expected that the line will be completed by the autumn.

The Vancouver, Fraser Valley and Southern Ry. is applying to the Dominion Parliament for an act extending the time within which the following lines of railway may be built; from New Westminster to the International boundary near Douglas; from the southern end of the Fraser River Bridge near New Westminster easterly to Chilliwack; from the south bank of the Fraser River westerly to Ladners Landing. It is also desired to have power to enter into agreements with the British Columbia Electric Ry. and its subsidiary, the Vancouver Power Co. (Feb., pg. 91.)

Buffalo and Fort Erie Ferry and Ry. Co.—We are officially advised that the company has not in contemplation the building of a line from Crystal Beach to Port Colborne, Ont., and a second track on the line between Crystal Beach and Fort Erie, as stated in press reports. (Feb., pg. 91.)

Calgary Municipal Ry.—Surveys are being made and plans prepared for an extension to the site of the C.P.R. new shops at Maharg, Alta. It is expected that construction will be started early in the spring. (Feb., pg. 91.)

Cape Breton Electric Co.—Surveys are being made, according to press reports, for lines from Sydney and Dominion to New Waterford, N.S. The first line mentioned would be 14 miles long, and the second about six miles. (Jan., pg. 38.)

The Chestermere-Calgary Suburban Ry. has begun the construction of an electric railway about 18 miles long to connect Calgary, Chestermere Lake, Hubalta, Belvedere, Victoria Square, Gladstone Heights, and six other subdivisions of Calgary, Alta. Everything has been purchased excepting the cars and substation equipment. The company will operate 10 cars and will furnish power for lighting purposes. Its repair shops will be located at Chestermere Lake, and it will purchase power from the Calgary Power Co. Following are the officers:—President, General Manager and Purchasing Agent, J. A. McCullough; Vice President, G. A. Shipps; Treasurer, A. D. McGillis; Secretary, W. H. Horner; Chief Engineer, J. H. Turner. The offices are in Calgary, and the capital is $250,000 authorized and issued. (Dec., 1911, pg. 1171.)

Coteau Power Co—Engineers are reported to be locating the route for an electric railway between Vernon and Kelowna, B.C., about 12 miles. The company, which is controlled by Mackenzie, Mann and Co., Ltd., is developing water powers near Vernon, and it is reported that work on the electric railway will be started this season. (Oct., 1911, pg. 973.)

Crows Nest Pass Electric Ry.—The Alberta Legislature is being asked to incorporate a company with this title to build an electric railway from Crows Nest Lake easterly to Cowley, Alta., about 25 miles. The provisional directors named are: W. A. Bebe, R. Coulthard, T. B. George, Blairmore, Alta. The line proposed to be built would serve Coleman, Blairmore, Frank, Bellevue, Passburg, Burmis, Lundbreck and Cowley.

Edmonton Radial Ry.—A bylaw authorizing the expenditure of $602,006.34 on extensions of the municipally owned electric railway system in Edmonton, Alta., has been approved by the taxpayers by 335 to 88. (Jan., pg. 38.)

Grand Valley Ry.—It was reported, Feb. 12, that the G.V. Ry. between Brantford and Galt, Ont., had not been operated for about a month, and the Paris town council passed a resolution calling on the company to reopen the line, and authorizing an application to the Board of Railway Commissioners in the event of it not being reopened at once. (July, 1911, pg. 683.)

Guelph Radial Ry.—The Guelph, Ont., city council has voted $13,500 for the extension of the electric railway in the city. (Jan., pg. 38.)

Halifax Electric Tramway Co.—Press reports state that the company is preparing to build about three miles of new track in the city. (Nov., 1911, pg. 879.)

Hamilton, Grimsby and Beamsville Electric Ry.—At a meeting held in St. Catharines, Ont., Jan. 31, one of the company's officials is reported to have stated that the projected extension of the line into that city would undoubtedly be made if satisfactory conditions could be secured. It is said that the difficulty lies in the cost of the right of way. The original surveys ran through a lot of fruit land, the cost of which is high, and an alternative route along the brow of the mountain is being considered.

Press reports have referred to a probable extension of the line from Beamsville to St. Catharines. It is more likely that a direct line would be built from Hamilton to St. Catharines on private right of way, the present line between Hamilton and Beamsville being on the highways.

Hamilton, Waterloo and Guelph Ry.—In an interview recently, the promoter, J. Patterson, of Hamilton, is reported as stating that arrangements were being completed for the building of this line; that there was no truth in the press reports that it would be built in the interests of the Canadian Northern Ry.; that the English interests behind the project were represented by Sir Robt. Perks; that the line would be built by McArthur Bros., of New York, and that construction would be started early in the spring.

We were officially advised Feb. 6 that nothing had been closed with McArthur Bros. or the International Bond and Share Corporation, but that the project was being examined and it was quite likely that some arrangement would be concluded in six or eight weeks. (Jan., pg. 33.)

International Railway (British Columbia).—A proposition is being made by representatives of this company for the building of an electric railway into the Delta district. The municipal council, Feb. 6, promised to give consideration to a definite proposal and the company's representatives undertook to submit one in about a month. H. T. Thrift, —. Leeson and —. McDuff stated that the company was backed by British capital; that it had about £1,000,000 on deposit ready to proceed with the development of its power plant and railway plans as soon as the various negotiations were successful; that it had secured ample water rights within 150 miles of Ladner, and that its engineers were at work on plans for developing them.

Lake Eric and Northern Ry.—The Minister of Railways has approved the route plan of this projected railway between Brantford and Port Dover, Ont., and the Board of Railway Commissioners has approved location plans for the line from the Grad River, Brantford to Port Dover. The route passes through Waterford and Simcoe, and the Board has also granted the right to cross at grade, subject to conditions, the Grand Valley Ry., the Toronto, Hamilton and Buffalo Ry. and the Michigan Central Rd. The question of crossing the G.T.R. in Simcoe, where a subway is asked, was referred to the Board's engineer. The Brantford city council has granted rights in the city to a terminus near the old G.T.R. station. (Oct., 1911, pg. 975.)

London and North Western Ry. of Canada.—Press reports state that plans are being prepared for the building of a dam and power plant at Rock Glen, near Arkona, Ont., the work being in charge of Smith, Kerry and Chace, Toronto. The estimated cost is $3,000,000. (Dec., 1911, pg. 1171.)

London Street Ry.—The extension of the electric lines in the city was considered by the London, Ont., city council Feb. 9. C. B. King, the company's Manager, said the question presented difficulties, as the wants of the city for the next ten years had to be considered. The building of a second track on certain of the existing lines was necessary to take care of existing traffic and to prevent congestion of traffic when the extensions were made. The company was ready to meet the city and discuss the question at length. (Feb., pg. 91.)

Maharg Electric Ry.—Application is being made to the Alberta Legislature to incorporate a company to build an electric railway in and radiating from Maharg, Alta., which is 4½ miles east of Calgary, and is the site of the new C.P.R. shops. Lougheed, Bennett, McLaws and Co., Calgary, Alta., are solicitors for applicants.

Medicine Hat Electric Ry.—Application is being made to the Alberta Legislature for the incorporation of a company with this title, to build an electric railway within the city of Medicine Hat, easterly to Dunmore, returning by a different route, and from Medicine Hat southeasterly to Elk Water Lake. W. A. Begg, Medicine Hat, is solicitor for applicants.

A public meeting was held in Medicine Hat, Jan. 31, when the proposed charter was discussed. The meeting favored the idea of municipal ownership, and a resolution favoring the franchise granted by the city council was passed, provided that it did not conflict with the rights of the municipality owning all public utilities. The proposed incorporation act contains a section, approved by the city council, providing that the city may on six months notice acquire the company's works within the city boundaries as they are at present or as they may be extended at any time hereafter.

Montreal.—The Montreal city council is asking the Quebec Legislature to authorize the building by the city of a boulevard, with a street railway on the banks, and in the vicinity of the aqueduct, and for the building of an underground railway in the city. (Jan., pg. 38.)

Montreal and Southern Counties Ry.—We are officially advised that the proposed extensions of this line are the electrification of the Central Vermont Ry. branch lines from St. Lambert to Richelieu, Que., 14 miles, work on which is now under way, and the following:—Richelieu to Marieville, five miles; Marieville to St. Cesaire, nine miles; a new line, St. Cesaire to Granby, 14 miles; and the line from Granby to Waterloo, 15 miles; a new line along the east side of the Richelieu River, from Richelieu to Sorel, 45 miles; a line from Longueuil to Boucherville, six miles; a line from St. Lambert to Laprairie, seven miles, and a line of about 120 miles from Laprairie through the counties of Huntingdon, Chateauguay and Beauharnois. The surveys for the necessary work on these lines are being made, but no definite decision has been reached as to when work on them will be started. The Quebec Government has been asked to grant a subsidy in aid of the building of the line from Richelieu to Sorel, 45 miles, but the Premier, while promising consideration, said a difficulty in the way was the fact that the company was operating under a Dominion charter.

The Montreal city council had under consideration, Feb. 15, the company's application for the extension of its lines to the main retail business streets of the city. W. B. Powell, General Manager, stated the case for the company, which is being given consideration.

A contract was reported let, Feb. 15, for the building of a new car barn and power substation in St. Lambert.

A contract is about to be placed for building a substation and four track barn in St. Lambert. (Jan., pg. 38.)

Montreal Tramways Co.—We are officially advised that the company has extended its Guy St. line with a single track from Cote des Neiges Road and Westmount Boulevard to the Roman Catholic cemetery, .75 of a mile.

The Montreal West corporation is asking the Quebec Legislature for power to grant the Montreal Terminal Ry., one of the M.T. Co.'s constituent companies, a franchise for 50 years.

Negotiations are still reported to be in progress between the M.T. Co. and the C.P.R. for the building of an extension along the C.P.R. right of way on the south side of the canal from Cote St. Paul to Lachine. (Feb., pg. 91.)

Moose Jaw Electric Ry.—Press reports state that arrangements have been made for the building of five miles of additional track during the current year. Our latest official advice stated that the laying of one mile of new track had been decided on, and that other extensions were under consideration. (Dec., pg. 1171.)

Mount McKay and Kakabeka Falls Ry.—The Ontario Legislature is being asked to authorize an increase of the capital stock to $500,000, and to extend the time for the completion of the company's authorized line of railway to April 30, 1916. J. E. Swinburne, Fort William, Ont., is the solicitor. (July, 1911, pg. 683.)

Nanaimo, B.C.—Application is being made to the British Columbia Legislature to confer upon the Nanaimo city council the right to build and operate a street railway within or without the city, subject to the approval of the ratepayers, and to authorize the council to obtain the necessary charter therefor under the provisions of the general Railway Act of the province. (Dec., 1911, 1911, pg. 1171.)

Niagara Fruit Growers' Tramway.—The Ontario Legislature is being asked to incorporate a company with this title to build an electric railway from Niagara-on-the-Lake to St. Catharines, Port Dalhousie and Queenston, all in Lincoln county, and to make connections with and obtain running rights over the lines of other companies. J. S. Campbell, St. Catharines, Ont., is solicitor for applicants.

Niagara, Welland and Lake Erie Ry.—A trust mortgage deed dated Sept. 1, 1911, between the company and the National Trust Co., Toronto, securing an issue of bonds, has been deposited with the Secretary of State at Ottawa.

We are officially advised that the company has a section of its line built through the principal streets of Welland, Ont., from the G.T.R. station to the Michigan Central Rd. and Toronto, Hamilton and Buffalo Ry. stations, 1.5 miles. The line is not yet being operated, but it is the intention to give a 15 minute service, using three cars. These are already on hand, and it is expected to start the service as soon as spring opens. Extensions are contemplated to be built in the early spring, the surveys for which are being made by H. Leach, the company's engineer. Contracts are being arranged for track and overhead material for these extensions. (Jan., pg. 39.)

Nipissing Central Ry.—It is understood, from an interview with J. L. Englehart, Chairman of the Temiskaming and Northern Ontario Ry. Commission, that tenders will be asked at an early date for building an extension of the N.C.R. from Haileybury to New Liskeard, about five miles. (Dec., 1911, pg. 1171.)

North Midland Ry.—The Ontario Legislature is being asked to confirm a bylaw voting a subsidy of $25,000 to the company, notwithstanding the fact that although approved by the large majority of taxpayers voting, it did not receive the requisite proportion of votes. (Feb., pg. 91.)

North Midland Ry.—The Ontario Legislature is being asked to extend the time within which the company may build its authorized lines of railway. T. H. Luscombe, London, Ont., is the solicitor. (Feb., pg. 91.)

Ontario West Shore Ry.—The municipalities which have been called upon to pay interest on the company's bonds which they had guaranteed, do not propose to take any action against the company at present. It was intimated to them recently that the company was making arrangements for the completion of the line, and for the paymnet of interest without calling upon the municipalities. (Feb., pg. 91.)

Ottawa and Lake McGregor Ry.—The Dominion Parliament is being asked to incorporate a company with this title to build a steam or electric railway from Ottawa to Hull, Gatineau Point, Perkins Mills and Lake McGregor, Que. Power is also asked to lay out pleasure parks and to develop summer resorts. J. A. Ritchie, Ottawa, is solicitor for applicants. (See Ottawa Electric Ry., Jan., pg. 39.)

Ottawa Electric Ry.—The company proposes to make additions to its power plant, build new car barns, and make certain additions to its lines, for which purpose $600,000 of the unissued stock is to be disposed of to the shareholders. It was said that one of the lines to be extended will be the Division St. line. The whole programme of extensions of the lines is being discussed with the street railway committee of the city council. The building of about 6.5 miles of new lines and extensions is being asked by the council.

Ottawa, Smith's Falls and Kingston Ry.—Application is being made to the Ontario Legislature to extend the time within which the company's lines may be built; to authorize the building of a line to Gloucester tp., Carleton county, and to change the name of the company to the Ottawa, Rideau Lakes and Kingston Ry. F. B. Proctor, Ottawa, is solicitor for the company. (Jan., pg. 39.)

Port Arthur and Fort William Electric Ry.—Application is being made to the Ontario Legislature by the Port Arthur city council for confirmation of a number of bylaws, including one to authorize the expenditure of $17,500 upon an extension of the street railway in the city easterly. Power is also sought to extend the railway outside the city limits. (Aug., 1911, pg. 783.)

Quebec Ry. Light and Power Co.—We are officially advised that it is the company's intention to extend its lines to the National Transcontinental Ry. shops near the north approach to the Quebec Bridge, as soon as the building of the shops is under way. The line will start from the present Sillery branch and will be about 3.5 miles long. (Feb., pg. 91.)

St. John's, Nfld., Electric Ry.—W. D. Reid, President, Reid Newfoundland Co., is reported to have stated in an interview recently that a car service would be given to the Waterford Bridge district during the summer, but he was unable to say whether it would be an extension of the present street car lines, or by the operation of electric cars on the steam railway. (Nov., 1911, pg. 1069.)

St. Thomas Street Ry.—The city engineer is preparing estimates for improving the line and for the building of extensions on Ross and Elgin Streets, St. Thomas, Ont. (Feb., pg. 91.)

Simcoe Ry. and Power Co—The Ontario Legislature is being asked to extend for five years the time within which the company may build the electric railway authorized to be built. W. Finlayson, Midland, Ont., is solicitor for the company. (June, 1911, pg. 557.)

Stratford Electric Ry.—J. A. Rothery, Manager of the Toronto and Eastern Ry., and connected with other of Mackenzie, Mann and Co.'s enterprises, is reported as having stated in Stratford, Ont., Feb. 7, that a start would be made with the building of the line by May 1. He had been in the city for several days, and it is said that the charter has been acquired by the Mackenzie, Mann and Co. interests, or that negotiations with that end in view are in progress. (Nov., 1911, pg. 1071.)

Sudbury-Copper Cliff Suburban Electric Ry.—Application is being made to the Ontario Legislature to incorporate a company with this title to build a line, with branches, from Sudbury westerly to Copper Cliff, and from Sudbury easterly to Coniston, Ont. Clary and Buchanan, Sudbury, Ont., are solicitors for applicants. (See Sudbury-Copper Cliff, Jan., pg. 29.)

Toronto City.—Application is being made to the Ontario Legislature by the city of Toronto for an act confirming, among other bylaws, one notifying the Toronto and York Radial Ry. of the city's intention to take over the line built under the franchise granted to the Toronto and Scarboro Electric Ry., Light and Power Co., by the agreement of Nov. 16, 1892. A declaration is asked that the city may take over such railway under the provisions of the Street Railway Act, chap. 171, of the Revised Statutes of Ontario, notwithstanding the repeal of the act; authority is asked to take over the line on Nov. 16, even if the arbitration to fix the value has not been completed, on payment into court of a sum to be fixed by a High Court judge; and to issue such debentures as may be necessary to provide the money required for taking over the line. Power is also asked to connect the line with the Toronto Ry., and to authorize the entering into agreements for the interchange of traffic and for running rights with the Toronto Ry.

The confirmation of a bylaw providing for the issue of debentures for $139,488 for the building and equipping of a double track line of street railway on Danforth Ave., from Broadview Ave. to 200 ft. east of Greenwood Ave., is also asked. (Feb., pg. 91.)

Toronto Civic Car Lines—The Lieut.-Governor has issued a proclamation bringing into effect the act authorizing the city to build lines within its boundaries, within which the Toronto Ry. operates under its charter. The act was passed by the Ontario Legislature in 1910, and gives the city power to build lines within the area in question if the T. Ry. Co. fails to build such lines as the city demands, within a certain time. In preparation for the coming into force of the act the council has finally passed the bylaw, carried by the taxpayers Jan. 1, for building a line on Danforth Ave.

Tenders were received to Feb. 20 by the Toronto board of control for the supply of track intersections and other special work layouts. (Feb., pg. 91.)

Toronto and York Radial Ry.—The Etobicoke tp. council has under consideration a proposition to extend the franchise of the Lake Shore division through the township for a further period of 21 years. The company's engineers are making surveys at Mimico Creek with the view of providing a private right of way. The proposed route would take the line 300 yards nearer the centre of the village and cut out a curve at New Toronto.

The question of the double tracking of the Metropolitan Division in North Toronto is still under discussion. The company has declined to accept the proposition made by the council, and on Feb. 4 the council appointed a committee to confer with the company with a view to arriving at some basis of agreement. (Jan., pg. 40.)

Toronto Suburban Ry.—W. H. Grant, Manager of Construction, Mackenzie, Mann and Co., Toronto, is reported as having stated in Guelph, Feb. 1, that the electric railway projected from Toronto to Guelph would be built as speedily as possibly, it being expected to start work in the spring, and that the plans for the entrance into Guelph were being prepared, but were not ready for submission to the city council.

In addition to the plans for the extension of the line from Weston to Woodbridge, Ont., which it is expected will be built this year, the plans for the extension of the line now ending at Lambton, to Georgetown, 25.5 miles have been approved. The route of this line is on a private right of way, through Lambton Mills village, south of Dundas St., crossing under the C.P.R. near Islington and alongside Dundas St., on the north side to Summerville, thence to the south side, and parallel with the C.P.R. from Dixie station to Cooksville station. The route then turns north, passing north of Cooksville and near Streetsville, and on through Meadowvale, Churchill, and near Huttonville and Norval to Georgetown. It is said construction will be started early in March. (Feb., pg. 91.)

Western Canada Power Co.—Plans for the building of an electric railway on the north shore of the Fraser River from Mission Jct. to Vancouver, B.C., about 40 miles, are under consideration. W. Neill, Assistant Manager, W.C.P. Co., has been advocating the construction of the line before the Vancouver board of trade and several of the municipal councils in the townships through which the line will pass. The proposed line would follow the Dewdney trunk road from Mission to Coquitlam, and would proceed thence to Vancouver by a direct route. The Provincial Government will be asked to grant aid towards the building of a railway and general traffic bridge over the Pitt River near Coquitlam. It is reported that a considerable portion of the land required for the right of way has been purchased.

Wheat City Electric Ry.—Application is being made to the Manitoba Legislature to incorporate a company with this title to build an electric railway in the city of Brandon and vicinity. Hull, Sparling and Sparling, Brandon, Man., are solicitors for applicants.

Winnipeg Electric Ry.—Plans for the extension of the company's Winnipeg-Selkirk line by the construction of a line to Stony Mountain and Stonewall, starting from near Middle Church, have been prepared. The plans for the line, so far as the Rockwood municipality is concerned, were approved at the council meeting held Feb. 8. The company is given a free right of way along the roads in the municipality, and the company agrees to have the line completed in two years. (Feb., pg. 91.)

SUPPLY OF RAILS, TIES AND FASTENINGS.

Separate tenders on prescribed forms will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, Canada, up to noon on Tuesday, March 19th, 1912, for the supply of the following:—

1. 250 tons 45-lb. "T" rail, A.S.C.E. section.
2. 100 kegs 5 in. x 9-16 in. spikes.
3. 1,400 pair angle bars for 45-lb. "T" rail.
4. 25 kegs ¾ in. x 3 in. bolts.
5. 810 tons 80-lb. "T" rail, similar to Lorain Section 335.
6. 972 tons 90-lb. girder rail, similar to Lorain Section 392.
7. 1,100 pair splice bars for Lorain Section 335.
8. 1,250 pair splice bars for Lorain Section 392.
9. 60 kegs 1 in. x 3⅝ in. track bolts and nuts (200 lbs. per keg.)
10. 5,300 pair of ⅞ in. x 5 ft. 3¾ in. steel tie rods.
11. 6,000 steel ties and necessary rail fastenings.
12. 4,000 wood ties, 5 in. x 6 in. x (6 ft., 7 ft., 8 ft. long).

Specifications and form of tender may be obtained on application to the Department of Railways and Bridges, City Engineer's Office, Toronto.

Envelopes containing tenders must be plainly marked as to contents.

Prospective tenderers will please only ask for the specifications covering those items on which they propose to tender.

Quick delivery will be required on Items No. 1, 2, 3, 4 and 12.

The tenderers shall submit with their tenders, the names of two sureties (approved of by the City Treasurer), not Members of the City Council or Officers of the Corporation of the City of Toronto), or in lieu of said sureties, the bond of a guarantee company approved of as aforesaid.

The lowest or any tender not necessarily accepted.

G. R. GEARY (Mayor),
Chairman of the Board of Control.
City Hall, Toronto, February 26th, 1912.

Regina Municipal Railway.

Following are details of the operation for the five months ended Dec. 31, 1911, the railway having been in operation 135 days.

EARNINGS.

Cash fares	$14,467.88
Ticket sales	8,328.70
	$22,996.58
Advertising on cars, etc.	641.00
	$23,637.58

OPERATING EXPENSES.

Maintenance of way and structure	$2,023.31
Maintenance of rolling stock	1,160.92
Maintenance of electric equipment	656.16
Conducting transportation	9,254.16
Power	2,898.30
General expense	1,654.11
	$17,646.96
Net earnings	$5,990.62

Car Mileage, 86.885 Miles.

Gross earnings per car mile	27.205 cts.
Gross operating expenses per car mile	20.311 cts.
Net earnings per car mile	6.894 cts.
Cost of power per car mile	3.334 cts.
Passengers carried	480,695
Gross earnings per day	$175.09
Net earnings per day	44.37
Gross operating expenses per day	130.72

Electric Railway Notes.

The Ottawa Electric Ry. has received one double truck locomotive type snow sweeper from the Ottawa Car Co. A full description with illustration of this sweeper was given in our January issue.

Winnipeg Electric Ry. Double Truck Car.

The Winnipeg Electric Ry. has ordered motors and trucks for 30 double truck cars which will be built at its shops this year. They will be 45 ft. 4 ins. long over all, and 8 ft. 5 ins. wide over all, and will be similar to the car which is illustrated in this issue.

The Winnipeg city council, Jan. 30, ratified an agreement with the Winnipeg Electric Ry., providing for the adoption of a single fare for a service to 2 a.m., instead of an all night service, which had been advocated. The agreement is terminable on a three months notice.

The Edmonton Radial Ry. has ordered 15 double end, double truck, pay-as-you-enter cars, the bodies of which will be built in the U.S., the electric equipment supplied by the Canadian General Electric Co., and the air brake equipment by the Canadian Westinghouse Co.

A special committee which has been investigating matters in connection with the Regina, Sask., Municipal Ry., recommended the city council, Feb. 14, to dismiss Superintendent Doughty. Citizens, Feb. 16, got up a petition to the council asking that the recommendation of the committee be rejected.

The Regina Municipal Ry.'s six cars, which are being built by the Preston Car and Coach Co., Preston, Ont., and mention of which has been made in previous issues, will be equipped with Westinghouse 101B2 electric motors, etc. The bodies will be 22 ft. long, and the length over all will be 31½ ft.

The Winnipeg Electric Ry. has ordered motors, trucks and equipment for 30 double truck cars, similar to the one illustrated in this issue, and which will be built at the company's shops this year. They will be 45 ft. 4 ins. long and 8 ft. 3½ ins. wide over all. Truck centres will be 21 ft. 11½ ins., with deep vestibules front and rear. The rear one is to be 7 ft. 4 ins. deep, with double entrance doors leading from the steps.

J. N. Shannahan has resigned as railway manager of the operating department of J. G. White and Co., Inc., of New York City, to become Vice President and general manager of the Newport News and Old Point Ry. and Electric Co., of Newport News, Va., now controlled by Allen and Peck, Inc.

The Ottawa city council has forwarded to the Ottawa Electric Ry. a petition asking for an extension of the workingman's ticket until 8 a.m. instead of to 7.30 a.m. as at present. In an interview, Feb. 10, the President said he thought the limit had about been reached in making further departures from contract requirements. In addition to concessions, not in the contract, as to tickets, the company was giving a service considerably beyond contract requirements. A recent report of the Superintendent showed that on the Bank St. line, except between 6 and 6.30 p.m., there were 50% more seats provided than were required, and that during that half hour the cars were only filled to 10% above their seating capacity.

The International P-A-Y-E Tramcar Co., Ltd., of London, Eng., expects to close early contracts to remodel about 4,500 busses and tramcars for P-A-Y-E operation. These contracts will include certain trial busses for the London General Omnibus Co. to be passed upon by the police authorities, in order to have the main features approved in connection with the best possible model platform for the proper collection of fares, based upon the zone system. This will affect about 3,300 vehicles. Then there will be one entire line for the Gateshead and District Tramways Co., a subsidiary of the British Electric Traction Co., to be ready for operation by March 1. There will also be a number of cars for the city of Leicester and on the Continent; 700 tramcars for the city of Paris; and a possible 1,000 omnibuses for a new company. T. W. Casey, General Manager of the P-A-Y-E Corporation, is now in Europe in connection with the matter.

Among the Express Companies.

F. H. McGarrett has been appointed agent, Dominion Ex. Co., Cobalt, Ont., vice G. Sims.

W. Cuthbertson has been appointed General Agent, Canadian Ex. Co., Liverpool, England.

H. Campbell Oswald, Assistant Secretary, C.P.R., has been appointed Secretary, Dominion Ex. Co., Montreal, vice A R. G. Heward.

Billet, Seigle and Co., Grenoble, and the Agence Lubin, St. Etienne, France, have been appointed receiving agents in the respective towns for the Dominion Ex. Co.

The Dominion Ex. Co. has opened offices at Arthurette, N.B., Baxter and Sherwood, Ont., Tregarva, Sask., and Colwood, Fitzgerald, Malahat and Port Alberni, B.C.

The Quebec Public Utilities Commission has dismissed the application of the town of Montcalm, for an order directing the Dominion and American Ex. Cos. to deliver parcels and packages within the limits of the municipality, on the ground that it has no jurisdiction to deal with the matter, as express companies are under the jurisdiction of the Board of Railway Commissioners for Canada.

The Canadian Northern Ex. Co. has issued instructions to its agents at transfer points, to the effect that they must not accept in local transfer nor on through waybills, any shipments waybilled or transferred, with charges to collect, when the packages are marked prepaid, either by the originating company's regular sticker or in any other legible manner to indicate that charges were paid in advance. The company offering the shipment in transfer must correct the billing or the entry on the transfer sheets to agree with the marks on the package.

The Dominion Ex. Co. has instructed its agents at common points with the Canadian and Canadian Northern Ex. Cos., that in case of shipments from points on either of the two lines mentioned, and which have to be handed back again to the originating company to complete transportation, it will be necessary for the agent at the point where the waybill is handed back to the initial company, to keep a record showing the name of the company, the number and date of the waybill, where from, where to, particulars of shipment, weight and charges, and the point at which waybill was originally transferred to the Dominion Ex. Co. A monthly report of such transfers, signed and dated by the agent, and showing the name of the office, must be sent to the audit office, using, in the meantime, form 53, and retaining an impression copy.

The Dominion Ex. Co. has notified its agents that on presentation of Government warrants properly filled out and signed in the space provided at the head of the form for the signature of the officer issuing the requisition, the person delivering the shipment also signing his name at the foot of the form, agents will accept and forward on regular waybills, shipments of military supplies, equipment, etc. The charges must be billed prepaid, and the Government warrant or requisition, together with a copy of the waybill, must be expensed on the agent at Ottawa for collection. In case of shipments to points on connecting lines, with which the company has a regular freight interchange, the charges to destination must be shown as prepaid, settlement with such lines being made in the usual manner. A separate warrant or requisition must be presented for the transportation of horses, stores, etc., such document to cover the actual movement from any one station to one destination only. One warrant or requisition will not be accepted to cover movement to camp and return, but a separate document must be obtained to cover movement each way when necessary.

Marine Department

The Dry Dock at Port Arthur, Ontario.

By A. V. Powell, M. Am. Soc. C.E.

Thunder Bay, on Lake Superior, is a body of water 16 by 26 miles in extent. It forms one of the best harbors—if not the best—on the great lakes. It is connected with Lake Superior by two outlets, two and four miles in width, and is protected from the winds by the palisades of Thunder Bay and Pie Island, 1,200 and 1,500 ft. high. The cities of Port Arthur and Fort William are located on the northern shore of the bay, near the western end, and except in name form a single commercial centre, the only port on the Canadian side of Lake Superior. To this port the three great transcontinental railways bring the products of the grain fields of central western Canada, and to it also the shipping of the great lakes carries the manufactured commodities and fuel for the great northwest. Ships encounter storms and meet with disasters, hence dry-docks are needed for repairs. Ships are lost, and more ships are needed to carry the increasing traffic, so shipyards are required. These needs account for the formation of the Western Dry-Dock and Shipbuilding Co., Ltd., of Port Arthur, Ont.

LOCATION OF DRY-DOCK.—In order to carry out the proposed undertaking in the manner that the enterprise seemed to justify, and to provide room for extending the facilities when the growth of business required, about 100 acres of land were needed, so located as to give not less than half a mile of dock frontage for dry-docks, shipbuilding berths, fitting-out slips, etc., and room in front for laying up ships for repair during the winter. In addition to this, an absolutely safe foundation must, if possible, be secured for the dry-dock. The site must also be as near as possible to the shipping centre of the district.

With these requirements in mind, nine locations were prospected, covering a bay frontage of seven miles. At all these points borings were made, and where satisfactory foundation was found preliminary estimates of cost were prepared. Finally a report was submitted, which was adopted, fixing on the Current River site for the plant. This location met all the conditions mentioned above in regard to foundations, water front, area and railway facilities, and was sufficiently near the shipping district.

Very complete borings were taken over the property before the docks were located (room having been reserved for another dock of the same size as the one constructed, and served by the same pumping plant). The place fixed upon put about two-thirds of the length of the docks outside the original shore line, the portal of the present dock being where the water was about 10 ft. deep.

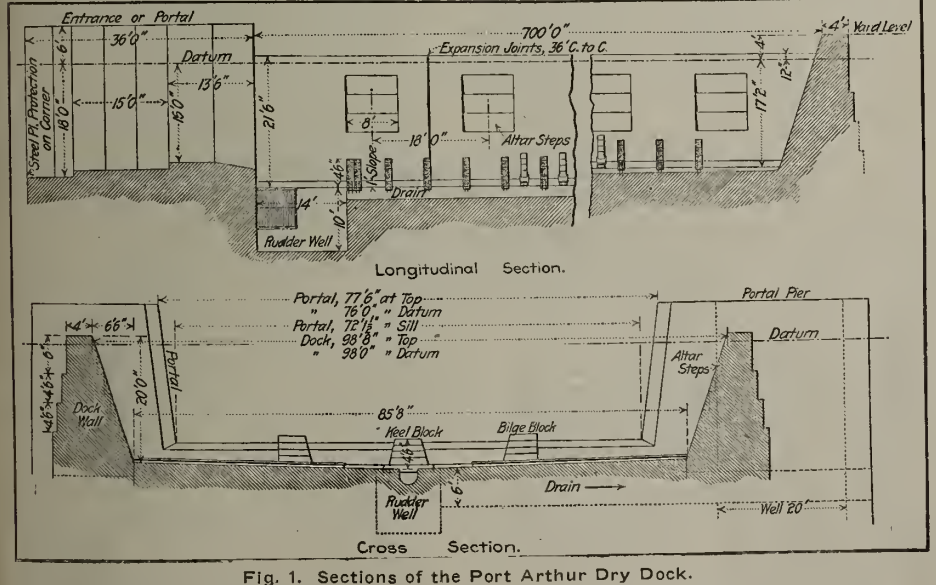
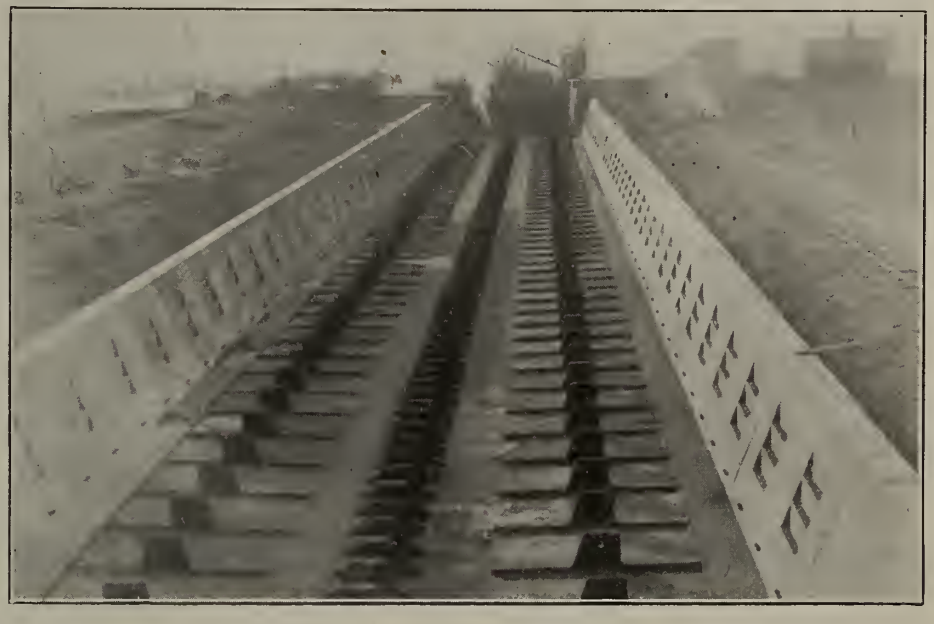


Fig. 1. Sections of the Port Arthur Dry Dock.

FOUNDATION.—The entire dock is built on solid rock. Above this was found the hardest kind of hard-pan, with many boulders. About 90% of the material excavated was hard-pan. The remainder was shale rock.

CONCRETE.—The nature of the foundation precluded the use of timber in the construction of the dock, even had it been otherwise desirable, and concrete



Concrete Dry Dock at Port Arthur.

was adopted. A 1:3:5 mixture was used, which was run soft in the large masses, side walls, portal piers, etc. It was dumped from cars running over the top of the forms, the drop ranging from 5 to 30 ft., and I believe resulted in a mass as nearly voidless as it is possible to get concrete. Timber was used for keel and bilge blocks, but not elsewhere.

DIMENSIONS OF DOCK.—In fixing the dimensions of the dock we were governed to a degree by past experience. The first dry-dock I designed was constructed in 1891. At that time, after much thought on the part of the owners, and after getting the opinions of vessel men, we concluded that 400 ft. would dock any ship that would ever be built on the lakes. I have since lengthened that dock 150 ft., but it is now altogether too short to take the largest boats. The largest ships on the great lakes at present are 600 to 608 ft. long over all, 60 ft. beam and 32 ft. deep. They draw (aft) light about 12 ft. of water. A ship of these dimensions will have about 450 ft. of dead flat frames, that is, frames of the same dimensions as the midship section. The "dead rise" will not exceed 6 ins. and the turn of the bilge 4 ft.

In other words, the vessel is a steel box sharpened at the ends and rounded at the lower corners. As a carrier it cannot be excelled. Its model is the outgrowth of the combined experience of shipbuilders and vessel owners covering a period of 30 years, and it is fair to presume that the type will continue. It is admitted by the majority of experts that the length of the lake boats cannot be increased very much without increasing the depth of the hull, thereby increasing the weight, and consequently

the draft of the ship. As the ships operating on the lakes are now loaded to the full working depths of the channels and harbors no material benefit can be obtained from increased size without the expenditure of unknown millions for harbor improvement.

However, there is always the man who wants the biggest of everything, and he is liable to come to the front with a ship in advance of the harbor appropriations. So we made the Port Arthur dock 700 ft. long to give him a chance to come in. This length also gives a chance to dock at one time two vessels of a class largely in use. The width of the dock on the bottom was fixed at average 85 ft. This admits light, gives ample room for working, and a clear passage for material going into the dock.

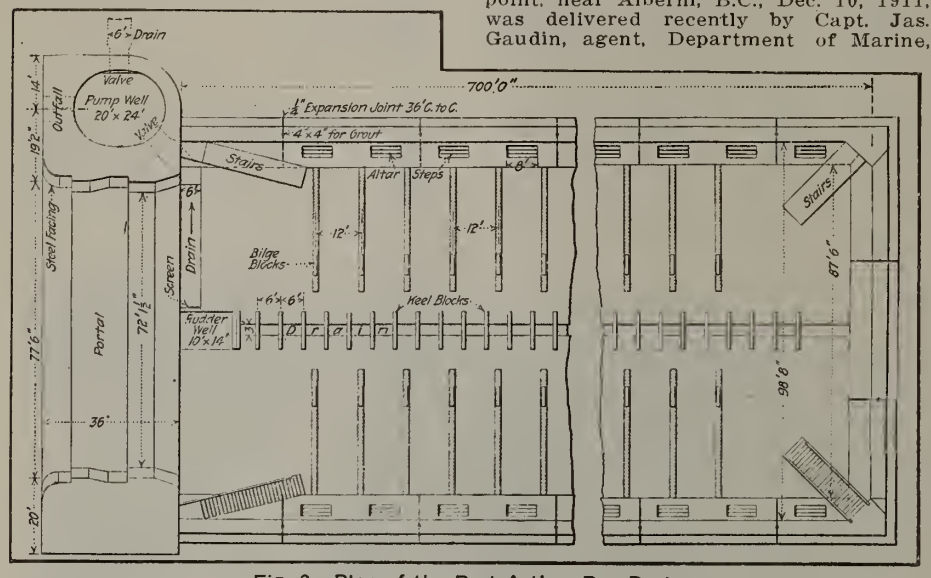


Fig. 2. Plan of the Port Arthur Dry Dock.

The sidewalls are given a moderate amount of batter for two reasons. First, as the spaces on both sides of the dock are to be used as building berths (ships 600 ft. or more in length will be launched into this dock), the walls are kept back so that the ship's bilge will not strike when it is launched. Second, the modern ship in dry-dock rests entirely on the keel and bilge blocks and shores are unnecessary. For this reason the altars used in the old dry-docks are also unnecessary. Provision is made, however, for shoring by stepping into the side walls at intervals near the top of the dock.

PORTAL AND CAISSON.—The clear width in the portal at the line of the sill is 72 ft. and the depth over the sill is 16 ft., Government datum. This gives ample depth, as loaded ships are never docked in lake dry-docks. The sill and jambs are steel. The caisson is constructed of steel, and its dimensions are given in fig. 3. It was erected in place between the piers of the portal.

PUMPING PLANT.—The pumping plant consists of two 30-in. centrifugal pumps driven by 200 h.p. d.c. vertical direct-connected motors. There is also an 8-in. centrifugal motor-driven pump for drainage. The pump well is located in the west pier of the portal and is provided with openings and valves to connect with dock no. 2 when that becomes necessary. Current for the motors driving the pumps and also the machinery of the shipyard is taken from the Current River hydro-electric plant owned by the city of Port Arthur and located alongside the dry-dock property.—Engineering News.

We are indebted to the contractors, the Canadian Stewart Co., Ltd., for the photograph from which the half tone illustration showing the interior of the dry dock is made.

Stranding of the s. s. Queen City.

The following judgment re the stranding of the s.s. Queen City at Dunsmuir point, near Alberni, B.C., Dec. 10, 1911, was delivered recently by Capt. Jas. Gaudin, agent, Department of Marine, Victoria, B.C., concurred in by Capts. Eddie and Shenton as nautical assessors.

The court finds that the stranding was due to an error of judgment on the part of the officer of the watch in estimating the distance from the shore, as well as the distance run by the ship, it being evident that had the ship been on her course with Dunsmuir point abeam, and the channel open to the southward, the stranding could not have occurred. The court does not deal with the officer's certificate, owing to his previous good record, but he is cautioned to be more careful in future to see that his orders to the helmsman are more particularly carried out.

The court cannot agree with the apparently ill-advised arguments put forward by counsel representing the Victoria Shipmasters' Association in making the statement that an officer in charge of a vessel would be guilty of negligence were he to satisfy himself that the actions of the helmsman were in accordance with his orders. Such an argument, if accepted, would be against all nautical precedence and diametrically opposed to seamanship having regard to the safety of life and property.

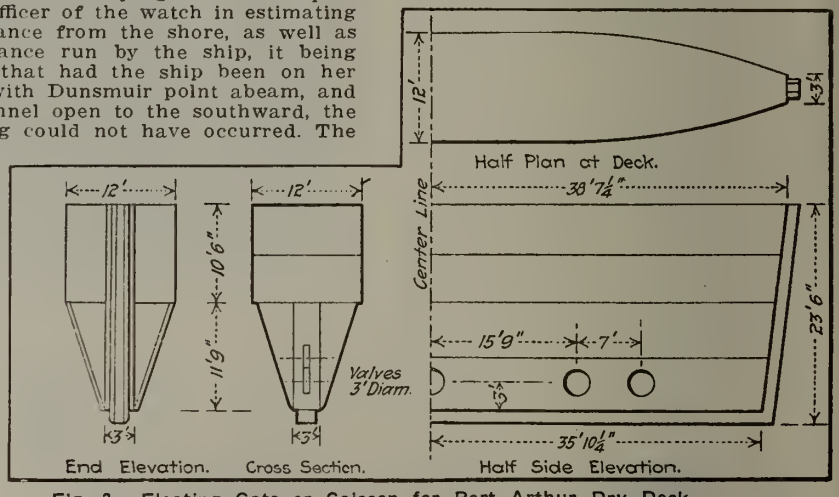


Fig. 3. Floating Gate or Caisson for Port Arthur Dry Dock.

The Soo Dredging and Construction Co., Ltd., has been incorporated under the Dominion Companies Act, with $100,000 capital and office at Sault Ste. Marie, Ont., to carry on a general dredging, towing, freighting, drydocking and construction business.

International Water Lines Passenger Association.

At the annual meeting in Detroit, Mich., recently, B. W. Folger, General Manager of the Niagara Navigation Co., on behalf of himself and G. Poole, Jr., of Chicago, presented the retiring President, T. Henry, Traffic Manager, Richelieu and Ontario Navigation Co., with a gavel. The handle of the gavel consists of a part of the steamboat Chicora, originally a blockade runner in the war between the Northern and Southern States, her name being Let Her Be. After the war she was brought to the Great Lakes and converted into a passenger vessel. She was the first steamboat owned by the Niagara Navigation Co., and was the mother of the present fleet of steamers plying between Toronto and Niagara River. Owing to her exceptionally strong construction she is still a popular passenger steamer on Lake Ontario. In the head of the gavel there is a part of the steamboat Cayuga, the latest addition to the N.N. Co. fleet. There is also a portion of the new steamboat Detroit III., building at Detroit for the Detroit and Cleveland Lines, and the largest ship of her class. Also a portion of the Washington Irving, recently contracted for by the Hudson River Day Line, which will carry 6,000 people, this being by far the largest certificate issued in the world. There is, in addition, a part of the twin screw river steamboat under construction at Toledo for the Thousand Islands Steamboat Co.

The following lines were admitted to membership:—Catskill Evening Line of Steamers, Coburn Steamboat Line, Crawford Trans. Co., Casco Bay and Harpswell Lines, Manhattan Nav. Co. There are now over 50 member companies.

Officers were elected as follows:—President—A. A. Heard, G.P.A., Champlain Trans. Co., Albany, N.Y.; Vice President—J. V. Foy, G.P.A., Niagara Navigation Co., Toronto; Secretary—M. R. Nelson, C.C., P.D., Northern S.S. Co., 1184 Broadway, New York, N.Y.; Executive Committee—C. F. Bielman, T.M., White Star Line, Detroit, Mich., 2 years; L. G. Lewis, G.P.A., Detroit and Cleveland Navigation Co., Detroit, Mich., 1 year; and J. Foster Chaffee, A.G.P.A., R. and O.N. Co., Toronto., 1 year. M. R. Nelson, C.C., P.D., Northern Steamship Co., New York, was re-elected Secretary, and the appointment was made permanent.

The Niagara Navigation Co. has been authorized by supplementary Dominion letters patent to increase its capital stock from $1,000,000 to $3,000,000.

The Iroquois-Noname Collision.

Following is a summary of the judgment re the collision between the International Steamship Co.'s s.s. Iroquois, under charter to the C.P.R. for its Pacific coast passenger service, and the steam tug Noname, off the Fraser River sandheads, Oct. 22, 1911, delivered recently by Capt. Jas. Gaudin, agent, Marine Department, Victoria, B.C., and concurred in by C. Eddie and W. Ladds, as nautical assessors.

The court finds that both vessels were approaching each other without any material change of bearing, a risk of collision existed, and both vessels acted either in ignorance or otherwise of article 16, International Rules of the Road, which provides under certain circumstances for the stopping of the engines, and cautious navigation, until the risk of collision is passed. Neither vessel made use of the signal prescribed by law, to indicate the direction it intended to take. At the time of collision the Iroquois was travelling at about 13 knots an hour and the Noname at approximately six knots an hour in the opposite direction, and the court is of opinion that the collision was entirely attributable to the speed at which the vessels were being navigated, and holds that both were at fault for non-compliance with the rules of the road. The court considers that the action of the officer in charge of the Iroquois in maintaining what is considered an excessive speed, under the circumstances, and in such a locality, contributed largely towards bringing about the collision, and refrains from commenting on the internal economy or discipline of the vessel, as she is of foreign register, but states that the use of the danger signal made by the Iroquois is not recognized in Canadian coasting waters. After giving full consideration to the matter of the master of the Noname, the court considers a reprimand sufficient. The court does not acquiesce in the idea generally prevalent amongst local navigators of the Pacific coast, that in order to make their courses good in foggy weather, they must maintain a comparatively high rate of speed. Assuming that those in charge of these vessels are conversant with the rate and direction of the tidal currents, recourse should be had to a simple problem in current sailing, which would justify a reduction of speed.

The Sealing Steamship Nascopie.

This vessel, which has been built at Wallsend-on-Tyne, Eng., to the order of Job Bros., Liverpool, Eng., in conjunction with the Hudson's Bay Co., and which will be employed in the Newfoundland seal fishery and in the H. B. Co.'s work in Hudson Bay, made her trial trip on the Tyne Jan. 24.

She is excessively strongly built of steel, and her form, strength and details of construction embody the latest practice for vessels intended to work amongst thick ice. Her stem is so formed that when she charges the ice she will glide upon it and crush it under her weight. The machinery, shafting and propellers have all been made specially heavy in order to cope with the shocks that she must receive amongst the ice. She is 285 ft. long by 43½ ft. beam by 29¾ ft. deep, and will carry 2,500 tons deadweight. The machinery consists of a set of triple expansion engines, supplied with steam by two boilers working under forced draught. On the trial trip, although the sea was rough and the weather decidedly unfavorable, she attained a speed of over 14 knots, being considerably in excess of the contract requirements. She has been constructed to attain the highest class at Lloyds, and has comfortable accommodation for the navigating staff, engineering staff and crew. She will also, when necessary, accommodate nearly 800 sealers.

The owners were represented on the trial trip by R. and T. B. Job and by Mr. Ingram, of the Hudson Bay Co.

After her trials, she left for Cardiff, where she shipped coal for St. John's, and also took on board the shipwrecked crew of the Newfoundland brig Bella Rosa, which was lost in mid-ocean recently. She sailed from Cardiff for St. John's, Feb. 7, arriving Feb. 14.

The Behavior of Water in Advance of a Steamboat on the Niagara River.

J. L. Jones, Assistant Professor of Mechanical Engineering, Oklahoma Agricultural and Mechanical College, writes: "The recent collision between the s.s. Olympic and H.M.S. Hawke has aroused considerable interest among engineers, and has brought to light many observations that have been appearing in the periodicals for some little time past. These things are not necessarily discoveries, but, rather, buried knowledge —things that have been seen so often and have become so familiar to the people who have lived among them that they had come to believe them to be known equally well to everyone. It is the same with many things in the engineering line; occurrences become so familiar that their importance is not appreciated.

"On the Niagara River there is a ferryboat that has been running between the foot of Ferry St., Buffalo, N.Y., and Fort Erie, Ont., for many years. Every time this ferryboat approaches its dock on the Canadian shore it causes a peculiar action of the water in its immediate vicinity. The water immediately offshore is very shallow, the depth reaching probably 4 ft. at a distance of about 50 ft. out. At this point there is a very steep bank, and in the next few feet out from the shore the depth of the water increases very rapidly so that the dock did not have to be extended very far out, as the boat could run right along the edge of the deep water. There is considerable current in the deeper part of the river just outside the dock, but on the 'shelf,' where the water is only 4 ft. deep, there is very little current owing to a projecting ice-breaker farther up the river. As the ferryboat approaches the dock, heading up the river as it always does, the water on the shelf begins to recede from the shore, the motion becoming faster and faster until the shelf is practically dry. So dry, in fact, that the children used to (and probably do now) run out from the shore after the water a distance of about 40 ft. They would be driven back by the wave which followed the boat and which would carry the water farther up on the beach than it was before. This same phenomenon occurred with either a screw propeller or a side-wheeler."

True Bearings to be Introduced.—The Department of Marine notifies that beginning with Jan. 1, true, or astronomic, bearings are being given in all notices to mariners issued. The bearings will be given in degrees, true, or astronomic, reading from 0 to 360, measured clockwise. These bearings may be followed by magnetic bearings, in degrees, in brackets. Where applicable all bearings will be given from seaward. In the forthcoming edition of the Canadian list of lights and fog signals, corrected to Apr. 1, true bearings only will be given, numbered from 0 at north, measured clockwise to 360.

The Civil Service Commissioners received applications, to Mar. 1, for the position of assistant to the Chairman of Steamboat Inspection at a salary of $2,100 a year.

Canadian Notices to Mariners.

The Department of Marine has issued the following:—

5. Jan. 27. 6. New Brunswick, south coast, Bay of Fundy, St. John harbor entrance, off southeast end of Partridge island, gas and whistling buoy to be permanently withdrawn. 7. New Brunswick, south coast, Bay of Fundy, approach to St. John, off Black Point, whistling buoy to be replaced by gas and whistling buoy. 8. Nova Scotia southwest coast, Frenchman point to Wedge point, buoys established, Goose bay, stakes placed. 9. Nova Scotia, Cape Breton island, Bras d'Or Lake, Barra strait, Derby point, name of lighthouse. 10. Newfoundland, south coast, Placentia bay, Placentia road, Verde point lighthouse station, fog alarm established. 11. Canada, Hudson bay, off Fullerton harbor, Barrel island, beacon rebuilt.

6. Jan. 30. 12. Quebec, Lake St. John, east side, Grande Decharge, Mistook, lights established. 13. Quebec, River St. Lawrence, Lanoraie to Ile Deslauriers, Repentigny channel, buoys renumbered.

7. Feb. 5. 14. British Columbia, Strait of Georgia, Active pass, Mayne island, Georgian point, change in fog alarm. 15. British Columbia, North Skeena passage, Inverness, Mid rock, conical buoy replaced by spar buoy. 16. British Columbia, Dixon entrance, Queen Charlotte islands, Langara island, lighthouse and fog alarm under construction.

8. Feb. 8. 17. Nova Scotia, Bay of Fundy, Chignecto channel, Joggins Mines, lighthouse established. 18. Nova Scotia, south coast, entrance to Halifax harbor, Sambro outer bank, lightship placed for winter months. 19. Nova Scotia, Cape Breton island, east coast, South Ingonish, wooden spar buoys replaced by iron buoys.

9. Feb. 10. 20. Ontario, Detroit river, lower end, changes in buoyage. 21. Ontario, Lake Superior, Michipicoten harbor, Little Gros Cap, hand fog horn at light station.

11. Feb. 20. 24. British Columbia, Vancouver Island, west coast, Quatsino sound, Entrance Island, hand fog horn at light station. 25. British Columbia, Strait of Georgia, sandheads of Fraser river, change in position of gas and whistling buoy, change in position of light ship.

Farrar Transportation Company's Report.

The report of operations for 1911, which was presented at the annual meeting, at Collingwood, Ont., Jan. 30, showed gross earnings of the steamboats Collingwood and Meaford, $119,082, and expenses of all departments, $74,357. The assets are $442,815.37, and total liabilities $358,045.75. A dividend of 10% was declared. T. I. Thompson, President, in presenting the report, suggested that the construction of another steamboat be considered for the 1913 season. The following is the board for the current year:—President, T. I. Thompson, Owen Sound, Ont.; Vice President, E. R. Wayland, Fort William, Ont.; Secretary-Treasurer and Manager, G. E. Fair, Collingwood; other directors—E. Stubbs, Sault Ste. Marie.; W. E. Allen, Toronto; W. T. Toner, G. P. Pearsall, Collingwood; M. Snetsinger, Thornbury; J. Shultis, Port Colborne, Ont., and D. D. Lewis, Philadelphia, Pa.

It is announced that a bill will be introduced into the British House of Commons shortly to authorize the construction of a railway and harbor at Galway, Ireland, with a view to the establishment of a quick Atlantic route between Galway and Halifax, N.S. It is claimed that the passage by this route can be made in from 2¾ to 3½ days.

Dominion Marine Association's Annual Meeting.

The Association's annual meeting was held in Ottawa Feb. 14, the President, Frank Plummer, of the Canadian Lake Transportation Co., in the chair.

The report of the executive committee showed that the membership, as well as the tonnage, had steadily increased, there being enrolled a registered steam tonnage of 150,364 tons and barge tonnage of 37,269 tons, making altogether 187,633 net registered tons, as against 175,594 net registered tons in 1910. The report dealt very fully with the past year's work, including the coasting laws, pilotage, St. Lawrence River power schemes, the grain trade (including the Montreal Harbor Commission, the Lake Shippers Clearance Association, trimming spouts on elevators, and trimming charges, the grain act shortages, bill of lading), entrance to Soulanges canal at Coteau, the Morrisburg canal upper entrance, G.T.R. air line bridge, Welland canal, Sault Ste. Marie lock, handling lines at canal entrances, opening of canals on Sundays, examinations and educational facilities for masters and mates, sick mariners dues, and U.S. tonnage tax in U.S. ports, Dominion legislation (including bill of last session to amend the Shipping Act, bill respecting wireless telegraph system on vessels, loadline bill, bill to amend the Water Carriage of Goods Act, bill respecting the pollution of navigable waters, the waterways treaty, the reciprocity measure and the grain bill), low water in the lakes and St. Lawrence, the Lighthouse Board, the Canadian Lake Protective Association, Fort William harbor, proposed harbor basin at Sarnia, Port Arthur harbor, dredging at Byng Inlet, eastern entrance Toronto harbor, Telegraph channel, Bay of Quinte, Salt Point channel, Kingston harbor, closing of navigation in 1911, aids to navigation.

The association's committee on aids to navigation presented a separate report, stating that a general list of recommendations had been submitted to the Lighthouse Board of Canada early in the year, that further requests had been submitted at later dates, and that favorable action had been taken in the majority of cases. The recommendations made and the action taken were set out in detail.

The reports having been adopted the unsatisfactory condition of affairs at Port Arthur and Fort William, and the great delays to vessels in loading there were discussed at considerable length, a committee, consisting of J. Playfair, F. Plummer, A. A. Wright, L. Henderson, and the Association's Counsel, F. King, being appointed to take the whole matter up with the Lake Shippers Clearance Association, with power, unless more satisfactory arrangements can be made with that association, to appoint other agents. It was the unanimous opinion that all surrenders should be in before the time fixed for a vessel's arrival to load.

The incoming executive committee was instructed to lay before the Dominion Government, particularly the Ministers of Railways and Canals, and of Public Works, the urgent necessity of widening and deepening the channel in the St. Marys River at Sault Ste. Marie approaching the entrance to the Canadian locks, particularly from a point east of the ferry dock to a point west of the New Ontario dock in line with the front of the ferry dock. This would widen the channel and eliminate the possibility of strandings, such as experienced by the steamboats Wexford and Turret Crown, and would greatly benefit Sault Ste. Marie harbor by making the Government dock and the New Ontario dock more easy of access. This applies particularly to the New Ontario dock, which is in general use by Canadian ships for fueling purposes, and it would be of great benefit to all boats of Canadian passenger and package freight lines making Sault Ste. Marie a port of call.

The following were appointed a committee on aids to navigation:—S. C. Calvin, J. Donelly, W. H. Featherstonhaugh, R. Fraser, J. B. Foote, H. H. Gildersleeve, D. Noonan, C. J. Smith, A. A. Wright, J. Playfair.

Under the bylaws four members of the executive committee retired, but were eligible for re-election, viz.: A. E. Mathews, S. C. Calvin, D. Murphy, and J. W. Norcross. Two other vacancies were caused by the death of G. B. Greene, and the resignation of J. P. Kavanagh. The following were elected to fill the vacancies:—A. E. Mathews, D. Murphy, J. W. Norcross, F. S. Wiley A. A. Wright, L. Henderson.

The dues in the Association for the current year were fixed at 2½c. a ton.

Officers were elected as follows:—President, J. Playfair, Midland, Ont.; First Vice President, D. Murphy, Ottawa; Second Vice President, L. Henderson, Montreal.

Deputation to Dominion Government.

The various representatives of steamship companies attending the meeting formed a deputation which was received in the House of Commons railway committee room in the morning by the Minister of Railways and Canals, the Minister of Marine, and the Minister of Public Works. The deputation was introduced by W. F. Nickle, M.P. for Kingston, Ont., and the ministers were addressed by the Association's Counsel, F. King, who urged that the lower St. Lawrence canals be repaired earlier each year, so that they could be opened earlier, and that the Welland and St. Lawrence canals be opened for traffic on Sundays. Recommendations were also made in reference to wrecking boats and tugs with tows of logs being allowed to carry passengers without license; to the necessity of better arrangements for the handling of lines at entrances to the canals, and to changes desired in the arrangements for the examinations of masters and mates. It was also strongly urged that in any power developments on the rivers or canals the navigation interests should be paramount.

Dinner at Ottawa Golf Club.

In the evening the representatives attending the meeting, accompanied by a number of guests, went by special cars on the Hull Electric Ry. to the Ottawa Golf Club, a beautifully situated and splendidly appointed building where they dined amid most charming surroundings. J. Playfair, President-elect of the Association, occupied the chair. The speakers in connection with the various toasts included Hon. G. E. Foster, Minister of Trade and Commerce, who emphasized the duty of his department to secure an increase of interprovincial, as well as external trade; Hon. J. D. Hazen, Minister of Marine, who dealt at length with his department's work for the marine interests, and with the great improvements made in aids to navigation, etc.; G. A. White, A.G.M. Hudson River Day Line, President of the Association of Passenger Steamboat Lines; A. A. Schantz, General Manager, Detroit and Cleveland Navigation Co.; W. F. Nickle, M.P. for Kingston, Ont.; D. Murphy, President Ottawa Transportation Co.; A. A. Wright, Managing Director, St. Lawrence and Chicago Steam Navigation Co.; F. Plummer, Vice President, Canadian Lake Transportation Co.; F. Cooke, ex-mayor of Ottawa; F. King, the Association's Counsel; Messrs. Prindiville, Hopkins and Dart, of underwriting firms, and Acton Burrows, Managing Director, The Railway and Marine World.

Richelieu and Ontario Navigation Company's Annual Report.

Following are extracts from the report for the year 1911 presented at the annual meeting in Montreal Feb. 19:—

	1911.	1910.
Gross receipts	$1,556,159.84	$1,437,931.42
Operating expenses	1,050,289.50	1,016,233.23
Fixed charges, interest, etc.	57,629.44	58,582.50
Net profit	$448,240.90	$363,115.69

The following quarterly dividends were paid:—March 1, 1½%, $46,980.00; June 1, 1½%, $46,980.00; Sept. 1, 1½%, $72,505.98; Dec. 1, 2%, $105,106.58; total, $271,572.56.

The authorized capital stock has been increased to $10,000,000. The paid-up capital has been increased by $2,179,875, to provide for the natural expansion of the company and the purchase of the Northern Navigation Co.

During the year $24,333.33 of the outstanding debentures have been redeemed and cancelled.

The insurance fund has been credited with $36,000 out of the year's earnings and $275,939.98 now stands to the credit of this account. This fund is in addition to the general insurance carried with insurance companies on shore properties, steamers, etc.

The new steamboat Rapids Prince for the Rapids Division, completed and delivered in Sept., 1910, went into commission June 1, 1911, and is fully up to expectations and requirements.

The twin-screw passenger and freight steamboat Saguenay, built on the Clyde, arrived from Glasgow under her own steam, June 26, 1911, and has run, in through service, direct from Montreal to Quebec, Murray Bay, Tadousac and the Saguenay River, in connection with the hotel and tourist traffic and has proved very satisfactory.

The company's hotels, the Manoir Richelieu and Tadousac, were very well patronized during the season.

Your company acquired control of the Northern Navigation Co. by the purchase of 9,648 fully paid-up shares of the capital stock, amounting in all to 10,000 shares. Your directors are pleased to report that the acquisition of this company is proving of material benefit.

The company has a fleet of 21 steamboats, ferries and tugs, with an aggregate tonnage of 36,713.

ASSETS.	
Steamers, real estate and buildings, docks, wharves, etc.	$4,774,396.11
Stocks and bonds of acquired companies	1,507,956.62
Bonds in treasury	13,560.03
Accounts receivable	224,478.14
Coal, stores, provisions, etc.	74,974.52
Collateral loans	455,800.00
Cash on hand	24,921.52
Insurance fund investment	275,958.13
	$7,352,045.07

LIABILITIES.	
Capital stock	$5,311,875.00
Bonds 5% sterling	1,233,633.33
Accounts payable	72,233.44
Unclaimed dividends	174.75
Accrued fixed charges	18,939.44
Insurance fund	275,939.98
Surplus	439,249.13
	$7,352,045.07

INCOME ACCOUNT.	
Surplus Dec. 31, 1910	$391,464.69
Net profit, year 1911	448,240.90
	$839,705.59
Dividends	$271,572.56
Carried to insurance fund	36,000.00
Written off steamboats, depreciation, etc.	92,883.90
Net surplus	439,249.13
	$839,705.59

At the Western Canada Railway Club's monthly meeting in Winnipeg, Feb. 19, a paper was read on the value of statistics by D. C. Coleman, acting General Superintendent, Manitoba Division, C.P.R.

Canadian Lake Protective Association's Annual Meeting.

The first annual meeting was held at Ottawa, Feb. 14. The report presented by the committee dealt fully with the reasons for the formation of the Association. One result of its work is covered in the following paragraph:—"The English underwriters were the first to give the Association full recognition, and announced in good time a rate of 5¾% as a basis rate for vessels belonging either to this Association or to the Great Lakes Protective Association of Cleveland. Both associations were thus placed exactly on the same basis and at a rate which was ¼% better than the basis rate of the preceding year. On the other hand, underwriters in New York, for various reasons which are not pertinent to this report, hesitated in coming to a conclusion. Ultimately they announced for members of the Canadian Association the same rate quoted in the English market, but as a concession to the United States organization at Cleveland, announced a rate for their vessels of 5½%, or ¼% less than that quoted for Canada. The result naturally was that members of the Canadian Association placed insurance so far as possible in the English market, where they received equal recognition with the Great Lakes Protective Association. Some fleets, however, had a good deal of their insurance covered in New York, and these suffered the discrimination of ¼ of 1% mentioned, to the extent to which they covered their risks there. Underwriters later announced that full recognition was withheld only until the Association should get in full working order, and prove that it could carry out its present intentions."

Reference was made to the establishment of casualty reports, and to the prevention of overloading. "During the year six masters and one engineer were censured by the committee. In addition, three masters and two mates have been summarily dismissed, and with the assistance of the Wreck Commissioner's court the certificates of two of the masters have been suspended. One case was referred to the Great Lakes Protective Association, as the offending vessel belonged to that organization. The complaint so far as known received no attention. A few cases are still under the committee's consideration.

"The cases in which the assistance of the Wreck Commissioner has been invoked are the wreck of the Turret Cape, the stranding of the Corunna on one of the Welcome Islands, the accident to the Emperor at the Sault Ste. Marie lock, and a collision between the Haddington and the Keystorm in the Cornwall canal. The first two cases are those in which the certificates were suspended as above stated, and these are two of the cases in which the men were dismissed by the owner. The investigation regarding the Haddington and Keystorm was asked for in the hope of settling questions regarding the proper method for meeting boats to pass each other in canals, but has not yet been held. In the Emperor case, the master was absolved and a set of rules has resulted to govern the locking of boats at Sault Ste. Marie, Ontario.

"The committee deeply regrets that the stranding of the Turret Cape, under circumstances which seem to afford no reasonable excuse for those in charge of her, should occur in a season which would otherwise have recorded no total loss. As it is, there is room for congratulation that the stranding of the Corunna, with one or two fairly serious casualties, including the breaking of the gates at lock 21 in the Welland canal, are the only other substantial disasters to record in which fault could be found with navigators. In one or two rather serious cases pilots specially engaged were at fault.

"The committee believes that the Association has already proved its efficiency for the purpose for which it was designed, and that the direct supervision of the navigation of all vessels enrolled, the recording of all faults and the punishment of all culpable negligence will have a distinctly beneficial effect and tend to reduce the ratio of losses to premiums very materially. It is, however, essential that there should be no half-hearted support of the policy adopted, and that on the other hand the members of the Association should assist in every way in forwarding the work of the committee."

ANALYSIS OF ACCIDENTS, 1911.

Strandings	5
Groundings	18
Collisions	18
Striking obstructions	5
Striking locks or lock gates	6
Striking bridges, docks, piers and banks	19
Burning boilers	1
Stress of weather	1
Damaged machinery	2
Fire in lamp room	1
Overran her own anchor	1
Total	77

Three broken or fouled transmissions included in above.

The following were elected as the committee for the current year:—J. Playfair, F. Plummer, S. Crangle, R. Fraser, J. W. Norcross, W. H. Featherstonhaugh, H. H. Gildersleeve, J. T. Mathews, C. A. Jaques.

Lake Grain Shipments.

The following statement, prepared by F. Symes, acting Grain Inspector, Fort William, Ont., shows the bushels of grain shipped by vessels from Fort William and Port Arthur, Ont., during the 1911 navigation season, from April 21 to December 10, compared with similar figures for 1910. The figures in each column, after the period, represent lbs.

1911	Wheat	Oats	Barley	Flax
Canadian vessels to Canadian ports	37,403,216.50	20,331,245.18	1,311,923.22	598,379.00
Canadian vessels to Foreign ports	997,068.40	.....	195,000.00	.....
Total Canadian Vessels	38,400,285.30	20,331,245.18	1,506,923.22	598,379.00
Total Foreign vessels to Foreign ports	32,548,076.10	1,191,348.05	788,615.29	621,119.26
Total shipments, 1910	70,948,361.40	21,522,593.23	2,295,539.03	1,219,498.26
Canadian vessels to Canadian ports	38,343,487.30	15,481,822.24	1,041,698.41	471,564.10
Canadian vessels to Foreign ports	1,772,153.10	382 948.24	62,965.10	480,960.16
Total Canadian vessels	40,115,640.40	15,864,771.14	1,104,664.03	952,524.26
Total Foreign vessels to Foreign ports	16,640,800.00	479,630.11	495,667.46	2,138,193.34
Total shipments	56,756,440.40	16,344,401.25	1,600,331.46	3,090,718.04

In addition to the foregoing, 451,100.50 bushels of wheat screenings, 2,697.18 bushels of flax screenings and 3,964.09 bushels of rye were shipped in foreign vessels to foreign ports, during 1911.

Niagara Navigation Company's Official Organization, Etc.

Consequent on the absorption of the Hamilton Steamboat Co. and the Turbine Steamship Co. by the Niagara Navigation Co., the latter's staff of officials has been somewhat augmented. The following N.N. Co. officials continue in their respective positions:—B. W. Folger, General Manager; J. M. Sullivan, Secretary; R. H. McBride, Treasurer; J. V. Foy, General Passenger Agent; S. J. Murphy, Travelling Passenger Agent; H. E. Weller, City Ticket Agent; J. Sullivan, Chief Steward.

W. E. Bishop, heretofore General Manager, Turbine Steamship Co., has been appointed General Agent, N.N. Co. at Hamilton; J. A. Goodearle, heretofore Manager Turbine Steamship Co., has been appointed General Freight Agent, N.N. Co., at Toronto; J. P. McConnell, heretofore City Ticket Agent, Turbine Steamship Co., has been appointed Assistant Freight Agent, N.N. Co., at Toronto.

The route between Toronto, Niagara-on-the-Lake, Queenston, Ont., and Lewiston, N.Y., will be served by the Corona, which will open the season, to be followed by the Chippewa and later by the Cayuga. Plans are being prepared for another vessel which will not probably be ready before 1914. The Toronto-Hamilton service will be opened by the Macassa; the Modjeska and the Turbinia will be put on as the season advances. The Chicora will be put on the route from Toronto to Olcott, N.Y., about the middle of June.

Cunard Steamships for Canadian Trade.

The Cunard Steamship Co. has ordered two steamships at Plymouth, Eng., for its Canadian service. The dimensions will be, approximately—length 538 ft., beam 63¾ ft., depth 46 ft. to shelter deck, with a gross tonnage of about 13,000 tons. They will be twin screw driven, and the equipment will include all the most modern improvements for the comfort and safety of passengers. Superior accommodation will be provided for 500 second class passengers, and approximately 1,500 third class passengers, the latter accommodation being arranged in two and fourth berth rooms. The machinery will consist of two sets of quadruple expansion engines, balanced on the Yarrow, Schlick and Tweedy system, with cylinders 26, 37, 53 and 76 ins. diar., by 54 ins. stroke, supplied with steam by double ended boilers.

The Northern Navigation Company's Annual Meeting.

The Northern Navigation Co.'s annual meeting was held Jan. 30, when the directors' report was adopted. Plans are in course of preparation for the building of a new vessel for the company's fleet, and it is expected that construction will be commenced in the spring. The following directors retired:—E. Bristol, M.P., W. G. Morden, T. P. Birchall and F. F. Pardee, M.P. The board for the current year is as follows:—President, Jas. Playfair, Midland, Ont.; First Vice President, J. R. Binning, Montreal; Second Vice President, C. J. Smith, Montreal; other directors, C. Caverhill, H. M. Molson, W. Wainwright, W. E. Davis, A. H. Sims and J. E. Dalrymple, Montreal; H. B. Smith, Owen Sound, Ont.; H. W. Richardson, Kingston, Ont., and F. A. Magee, Hamilton, Ont.; H. H. Gildersleeve, Sarnia, Ont., continues as Manager; F. P. Smith, Secretary of the Richelieu and Ontario Navigation Co., Montreal, has been appointed Secretary, and C. A. Macdonald, Assistant Manager, has also been appointed Treasurer.

The net profits for 1911 were about $152,000, or over 15% on the total capital.

Trans-Atlantic Fast Steamship Service.

An Ottawa press dispatch of Feb. 19 stated that negotiations in progress between the Government and certain Canadian and English transportation companies operating trans-Atlantic steamships will probably result in the establishment of a new fast service between Canada and England. The proposals involve the formation of a new steamship company in which English capital will be interested, and which will be backed by the C.P.R., C.N.R., G.T.P.R., and the Allan Line. It is stated that the proposed company will put into service steamships with a speed of 24 knots an hour, thus shortening the time across the Atlantic to 4½ days, and involving an expenditure for new vessels of about $30,000,000. A later dispatch stated that any such undertaking as that mentioned would be undertaken by the C.P.R. alone, neither of the other companies mentioned being concerned.

Atlantic and Pacific Ocean Marine.

The Quebec Steamship Co.'s s.s. Trinidad has been chartered for a voyage to the West Indies and the Panama canal in March.

The Union Steamship Co. of New Zealand's steamship, which is under construction for the Canada-Australia service, at Glasgow, Scotland, is expected to be ready early in 1913.

The Allan Line announces that it has arranged for vessels on its London route to call at Plymouth, the first being the s.s. Sicilian on Apr. 19, and after May 17 a call will be made there on each of the fortnightly trips between London and Quebec and Montreal.

Lamport and Holt of Liverpool, Eng., owning and operating steamships to various parts of the world, but chiefly concerned with the South American trade, have appointed D. E. Brown and Macaulay, Vancouver, B.C., as their agents for the Pacific coast.

Fanning Island, in the Pacific Ocean, is reported to have been sold to C. N. Armstrong and associates, Montreal, for $350,000. It is stated to be the intention to make the island a free port, and to erect large wharves with all the necessary shipping facilities, oil tanks and coal bunkers for steamship service in connection with the Panama canal operation.

It is announced from Ottawa that the Government has decided to send out two engineering parties to make a hydrographic survey of the west coast of Hudson Bay before coming to any decision as to the adoption of either Port Nelson or Fort Churchill as the deep water terminus of the projected Hudson Bay railway. One party will go over the route by land and the other by water, the land party being expected to leave Winnipeg towards the end of February.

The Vancouver Board of Trade is asking the Dominion Government to grant a subsidy to the Canadian Mexican Pacific Steamship Co. for the service between Vancouver, Victoria and Salina Cruz, with permission to call at San Francisco. The former company operating this line was granted a mail subsidy on condition that the service was a direct one between B.C. ports and Salina Cruz. Two vessels are being run on a monthly schedule, but it is intended, if a subsidy is obtained, to make it a 21-day service.

The Dominion Line s.s. Southwark, which has been operating for several years between Great Britain and Canada and the United States, has been sold to ship breakers, the price paid being given as £14,250. She was built in 1893 at Dumbarton, Scotland, and was equipped with quadruple expansion engines with cylinders 25½, 37½, 52½ and 74 ins. diar., by 54 ins. stroke, 1,237 n.h.p., driving twin screws. Her dimensions were—length 477.9 ft., breadth 46.1 ft., depth 24.9 ft., tonnage 8,697 gross, 5,642 register.

The Allan Line has purchased the s.s. Romanic, formerly New England, from the Oceanic Steamship Co. She was built at Belfast, Ireland, in 1898, and is twin screw driven, with quadruple expansion engines, with cylinders 30, 50, 58 and 58 ins. diar., by 54 ins. stroke, 985 n.h.p. Her dimensions are—length 550.3 ft., breadth 59.3 ft., depth 35.9 ft., tonnage 11,394 gross, 7,410 register. For the past few years she has been operating between Mediterranean ports and Boston, Mass. It is stated that she will be re-named Scandinavian.

An Ottawa press dispatch states that on the completion of the projected Hudson Bay railway and the necessary terminal facilities at either Port Nelson or Fort Churchill, a responsible steamship company operating on the Atlantic will be prepared, provided a suitable arrangement is made, to establish a fast freight service to Great Britain by the Hudson Bay route. In the meantime, it is stated, the Government will send out an expedition to fix the exact route, marking straits and locations for lighthouses and wireless telegraph stations, a start being made with this work this winter, to settle just how soon the passages are free.

Following on the recent visit of D. B. Hanna, Second Vice President, Canadian Northern Steamship, Ltd., to Great Britain, in connection with the arrangements for the forthcoming immigration season, an arrangement has been made with the Cunard-Thomson Line, whereby the Canadian Northern third class passengers, which the company is unable to accommodate on its vessels, will be taken by the Cunard-Thomson Line, the latter transferring to the former any surplus first class passengers. The Cunard-Thomson Line will continue to run from London and Southampton, probable also calling at Plymouth, and Bristol. The report that the Cunard Line is to absorb the Royal Line is without foundation.

The White Star s.s. Titanic, which is being built for the Atlantic trade, is scheduled to make her maiden trip in April and to leave New York again in April 20 for Plymouth, Cherbourg and Southampton. The masts and all four funnels are now erected, the machinery on board and the ironwork of the superstructure well advanced. The inside work is also proceeding apace. The first and second class passenger elevators are fitted, the floors are well advanced, and an interesting feature is the cementing and tiling of the swimming pond, which is progressing rapidly, as also the elaborate decorative work in the public apartments.

Muskoka Lakes Navigation and Hotel Co.—In our last issue, in referring to the annual meeting held in Toronto in January it was stated that J. S. Playfair, who had been President for several years, had retired and had been succeeded by H. C. MacLean, of Toronto. It has since been learned that Mr. MacLean and his associates control about 90% of the capital stock, which amounts to about $170,000, having recently bought out most of the other interests at about 80% of the par value. The company does not issue a financial statement, but it is said that the transportation department made a net profit in 1911 of some $25,000, while there was a loss of some $500 on the Royal Muskoka Hotel, leaving a net profit on the whole operations of something over $24,000.

Maritime Province and Newfoundland.

C. W. Seeley, Inspector of Steamboats, Halifax, N.S., died there Jan. 30, aged 64, after a short illness.

The plans for the year announced by the Governor of Newfoundland, at the opening of the Legislature, Feb. 14, include improvements in the fisheries, additional coastal steamships and better wireless and other telegraphic facilities.

The Navigation Syndicate, Ltd., has been incorporated under the New Brunswick Companies Act, with $30,000 capital and office at Nordin, to own and operate steam and other vessels, and carry on a general navigation business.

The Dominion Government is reported to have awarded the contract for the construction of harbor works and improvements at Courtenay Bay, St. John, N.B., to Norton Griffiths, Ltd., of England, involving an expenditure of about $7,500,000.

The Reid Newfoundland Co.'s s.s. Bruce, which has been built at Glasgow, Scotland, sailed from the Clyde, for St. John's, Nfld., Feb. 4, arriving Feb. 12, when she was immediately placed on her route between Port aux Basques and Sydney, N.S.

The dredging plant operated by A. and R. Loggie, Loggieville, N.B., is reported to have been sold, together with the Eastern Dredging Co.'s plant, to J. F. Gleason, T. Nagle and H. McInerney, for about $250,000. The headquarters of the new concern will probably be at Newcastle.

Crosbie and Co.'s sealing steamer Sagona, which has been built at Dundee, Scotland, was expected to arrive at St. John's, Nfld., towards the end of February. Her dimensions are: length, 175 ft.; breadth, 28 ft.; depth, 13½ ft.; tonnage, 700 gross, and she is equipped with triple expansion engines for a speed of 12 knots an hour.

It is reported from Ottawa that the Government intends to appoint a commission of three to investigate the various systems of pilotage prevailing in different parts of the Dominion, with a view to adopting a uniform system, and that the commission will consist of one representative from the shipowners, one from the pilots, and a third, independent of either.

W. D. Reid, President, Reid Newfoundland Co., who was visiting Newfoundland early in February, is reported to have stated that it is likely that the company will order another vessel during the year, probably to take the place of the s.s. Invermore, between Port aux Basques and North Sydney. The Invermore will probably be transferred to the Labrador route.

The Reid Newfoundland Co.'s s.s. Bruce, recently built at Greenock, Scotland, arrived at St. John's, Nfld., Feb. 12, having taken seven days and 21 hours on the voyage. The average speed was 12 knots an hour. She is built of steel, and specially designed for service among ice. Her dimensions are—length 250 ft., breadth 36 ft., depth, 25¼ ft., 1,700 gross tons, and she is equipped with triple expansion engines having cylinders 25, 42 and 68 ins. diar. by 45 ins. stroke, supplied with steam from four boilers at a working pressure of 180 lbs., giving about 3,000 i.h.p. She has been placed on her route between Port aux Basques and North Sydney.

One of the most remarkable developments of shipping in connection with the use of oil fuel is reported from Liverpool Journal of Commerce. Contracts are stated to have been given recently for the building of 21 oil tank steamships of large dimensions which will be adapted for the consumption of either coal or oil. Several of these are for owners on this side of the Atlantic.

Province of Quebec Marine.

P. A. Jodoin, heretofore overseer of the Chambly canal, has been appointed Inspector of Stores, Queoec canals, and E. Robitaille has been appointed overseer of the Chambly canal.

The Minister of Marine, replying to questions in the House of Commons, stated that the total debenture debt of the Montreal Harbor Commission was $16,707,000, of which $1,872,000 was due to the public, and the balance to the Government. The interest payable to the Government was 3% on $9,195,000, and 3½% on $5,540,000. The interest due on Jan. 1 was $218,430.99.

The Department of Marine is dredging a 15 ft. channel in the St. Lawrence River, north of the ship channel, leaving the deep channel near Lanoraie, leading up past Lavaltrie, St. Sulpice and Repentigny, and rejoining the ship channel above Ile Deslauriers The buoys in this channel will bear the letter R, preceding a number, whereas the buoys in the ship channel will bear the letter M, preceding a number.

The Minister of Marine has given notice of a resolution in the House of Commons, providing for a further loan of $6,000,000 to the Montreal Harbor Commissioners for the completion of the terminal facilities of the harbor according to the plans already approved by the Government, and to retire debentures amounting to $600,000, maturing in equal portions in 1913, 1914 and 1915. The terms of the loan will be the same as previous loans, the interest being 3½%, and the loan repayable within 25 years.

A deputation consisting of A. A. Allan. President, and T. Robb, Manager of the Shipping Federation of Canada, J. Thom, Manager, International Mercantile Marine Co., Montreal, and G. T. Davie, of Levis, waited on the Minister of Marine, Feb. 8, to urge that the Levis dry dock and ship repair plant be taken over by the Government. It was stated that the plant is not prospering, but if it were taken over and enlarged it could be made into a very valuable repairing and salvage plant able to look after the largest vessels using the St. Lawrence route.

The Department of Marine received tenders to Feb. 26 for the supply of a steel single screw hopper barge, and one or two single screw bucket dredges for the St. Lawrence ship channel service. Following are the chief details—for the barge, length between perpendiculars, 180 ft., breadth moulded 32 ft., depth moulded 14½ ft., draught, mean to bottom of keel plate, 12 ft., deadweight on foregoing draught 785 tons, coal supply 90 tons, complement of officers and men 16, indicated horse power 500, net capacity of hopper, 530 cub. yds., to be built of steel throughout, classed 100A1, Lloyds' river service, under their special survey and Government inspection; for the dredge, length between perpendiculars 195 ft., breadth moulded 37½ ft., depth moulded 14 ft., normal draught in fresh water 9½ ft., deadweight on foregoing draught 150 tons, coal supply 130 tons, indicated horse power 800, dredging depth 52 ft., capacity of buckets 27 cub. ft., speed of buckets 10 to 12 and 18 to 20, to be built entirely of steel, to Lloyds' 100A1 dredger class, under their special survey and Government inspection.

Ontario and the Great Lakes.

Capt. T. J. Jones, who sailed on the St. Lawrence and Rideau Rivers, died in Ottawa. Feb. 20, aged 92.

The St. Clair and Erie Ship Canal Co. is applying to Parliament for an extension of the time within which it may build the works authorized in the act of incorporation.

C. Noble. Manager, Dominion Transportation Co.. Owen Sound, operated by the United States and Dominion Transportation Co., Chicago, Ill., died at Collingwood, Feb. 13.

A. Taylor is reported to have been appointed superintendent of the construction work on the breakwater and harbor improvements, which are being undertaken by the Public Works Department, at Port Stanley.

I. B. Folger, Kingston, is reported to have purchased the steamboat Robert McDonald, which went ashore at Chaumont Bay last year, and it is stated that he intends having her refitted for the lake and river service.

A bill was introduced into the U.S. Congress, Feb. 16, providing $250,000 for a survey and estimate of cost of a ship canal to connect the navigable waters of the Niagara River, making a continuous water route between the five great lakes.

The Shenango Steamship Co.'s steamboat William P. Snyder, Jr., was launched at Detroit, Mich., Jan. 28. She is, with the same company's steamboat Schoenmaker, the largest vessel on the lakes. The dimensions are: length overall, 617 ft.; breadth, 64 ft.; depth, 33 ft., with a deadweight capacity of 14,200 short tons on a draught of 19½ ft.

The Minister of Public Works has given notice of a resolution in the House of Commons, providing for the ratification of an agreement for the building of another dry dock at Collingwood, and authorizing the payment of a subsidy for a dry dock of the second class of 3% each year for 20 years on $306,965, the cost of construction.

The Port Colborne and St. Lawrence Navigation Co., Ltd., has been incorporated under the Dominion Companies Act, with a capital of $100,000 and office at Toronto, to carry on the business of a navigation company, and for other purposes. The incorporators are:—Cawthra Mulock. E. H. Laschinger, W. D. Robertson, and C. W. Band, Toronto.

The Calvin Co. has purchased the steamboat Cornwall from the Richelieu and Ontario Navigation Co., and intends to fit her out completely for wrecking purposes. She was built at Kingston in 1874, and was formerly named Algerian. She is paddle wheel driven, equipped with engine of 88 n.h.p., and her dimensions are—length 175.3 ft., breadth 27.1 ft., depth 9.9 ft., tonnage 914 gross, 576 register.

An Ottawa press dispatch states that the Government has practically decided to commence work in the spring on the enlargement of the Welland canal in part, and the construction of a large new section for the remainder of the distance, the whole being 22 ft. deep. Surveys in connection with this work were made last summer, and it is stated that the plans are practically completed. The cost is estimated at $30,000,000.

The Northern Navigation Co. has made the following appointments to its vessels for the forthcoming season:—

City of	Captain.	Chief engineer.
Midland	M. Livingstone	J. Osburn
Doric	S. Hill	.....
Germanic	F. Noles	S. Burgess
Hamonic	R. D. Foote	S. Brisbin
Huronic	A. L. Campbell	F. Norris
Ionic	J. D. Montgomery	J. Louden
Majestic	W. G. Cox	S. Beatty
Saronic	A. M. Wright	W. Whipp
Waubic	W. Carson	S. Murray

Recommendations for improvements to the harbor at Kingston, made to the Public Works Department, include the erection of a new bridge on the site of the present one. with a draw in the centre, 140 ft. wide, the inner and outer portions being made 300 ft. wide, made into a causeway and use for wharfage, the dredging of the inner and outer harbors, and the building of a wharf on the Martello Tower shoal.

E. L. Cousins, Engineer of the Toronto Harbor Commission, commenced a hydrographic survey of the bay, Feb. 7. The work is being carried out by two parties, one on shore, and the other working on the ice. On the completion of this, a geographical survey will be made. J. G. Sing, M. Can. Soc. C.E., District Engineer, Dominion Public Works Department, Toronto, has been appointed Consulting Engineer to the Commission. The appointment will not interfere with his Government duties.

The U.S. Lake Survey reports the levels of the Great Lakes in feet above tidewater, for January, as follows:—Superior, 601.75; Michigan and Huron, 579.32; Erie, 571.30; Ontario, 244.76. As compared with the average January levels for the past 10 years, Superior was 0.38 ft. below; Michigan and Huron, 0.76 below; Erie, 0.37 ft. below, and Ontario, 0.63 ft. below. It was anticipated that Superior would fall 0.2 ft. during February, that Michigan and Huron would remain stationary, Erie fall 9.1 ft., and Ontario rise 0.1 ft.

The Department of Railways and Canals is reported to have awarded W. B. Russell, Toronto, the contractor for the construction of the Newmarket canal, which work has been abandoned by the Government, $1,000 as compensation for the cancellation of the contract. In addition to this it is stated that he has been awarded the contract for the rebuilding of all the bridges over the canal and the repairing of the highways demolished in the course of the construction work. An engineer's report on the matter states that over 80% of the work has been completed, and that the amount required to complete it would be about $200,000.

At a recent meeting of the Owen Sound council, the mayor announced that he had received a communication from the C.P.R. stating that the company would remove its vessels to the Port McNicoll route in the spring, and intimating that it might be possible to have one of its vessels call each week at Owen Sound on the up trip. It was also stated that the volume of grain traffic to Owen Sound would not justify the company in rebuilding the grain elevators recently destroyed by fire. A deputation was appointed to meet Vice President McNicoll, and discuss the matter fully, with a view to arranging a more frequent service.

At the recent annual meeting of the Mutual Steamship Co., Toronto, it was announced that the majority of the stock had been acquired by J. W. Norcross, Toronto, and R. M. Wolvin, Winnipeg. It is reported that the company has two vessels under construction for its service during the forthcoming season, but we are officially advised that the company is not in a position at present to state that it will make any additions to its fleet this year. Following are the officers and directors for the current year:—President, R. M. Wolvin; Vice President and Managing Director, J. W. Norcross: other directors, H. Munderloh, C. D. Secord and T. White.

Manitoba, Saskatchewan and Alberta.

The Hudson's Bay Co. is stated to have made arrangements for the construction of two steamboats at Athabasca Landing, Alta., one for operation on the Athabasca River, and the other on the lake The former will be 150 ft. long, and will be equipped with the machinery from the company's steamboat Hazleton, which, until last season, was run on the Skeena River. The second boat will be 110 ft. long.

British Columbia and Pacific Coast Marine.

It is reported that plans are in preparation for the construction of a fisheries protection cruiser for B.C. waters to replace the Kestrel.

A small steamboat is under construction at Ladner, B.C., for Capt. Martinolich. The engines, boiler, searchlight and other equipment have been purchased in England.

The Canadian Puget Sound Lumber Co. has ordered a steel tank scow for transporting oil fuel at Esquimalt, and it is reported that three steamboats for the coasting trade have also been ordered there

The Dominion Government steam tug, Point Grey, which has been built at North Vancouver, was expected to be ready for service towards the end of February. She is to act as tender to the dredge Mastodon.

At the recent annual meeting of the Victoria Shipmasters' Association, Capt. D. L. Jones was re-elected President, and H. Bilton, W. Heater and E. Parsons, were elected First and Second Vice Presidents, and Secretary, respectively.

The G.T.P. Coast Steamship Co.'s s.s. Prince George has been equipped with oil burners at Esquimalt, and is scheduled to take the place of the s.s. Prince Rupert, on the northern route, Mar. 3, when the latter vessel will be taken from service to be similarly equipped.

The Coastwise Steamship and Barge Co., Ltd., has been incorporated under the Dominion Companies Act, with $250,000 capital and office at Vancouver, to own and operate vessels, and carry on a general water transportation business. The incorporators are, J. Griffiths, Seattle, Wash., W. R. Dockrill, T. Ludgate, G. F. Cameron and C. Stewart, Vancouver.

The contract for the construction of about 6,900 ft. of jetty, at the mouth of the Fraser River, for $171,000, is reported to have been awarded by the Dominion Public Works Department, to T. F. Sinclair, New Westminster. Of the length of jetty named, 3,100 ft. will be single bulkhead, and the remainder, double bulkhead. It will commence from about 968 ft. from the Garry Point tide gauge, near Steveston.

Press reports state that the Dominion Public Works Department is about to place an order for another rock crusher, similar to the one recently built in Scotland, for use in B.C. waters. It is recommended that should such an order be placed, the system of anchoring should be similar to that adopted on the dredges Ajax and Mudlark, as the number of cables employed in anchoring the rock crusher prove a menace to shipping.

The C.P.R. s.s. Princess Patricia, formerly Queen Alexandra, which the C.P.R. recently purchased and has had re-modelled for its Vancouver-Nanaimo route is on her way to the coast by way of the Horn. Owing to her small bunker capacity a number of calls have to be made for coal. Among the places called at are Cardiff, Las Palmas, St. Vincent, Bahia, Monte Video, Punta Arenas, Coronel, Callao and San Francisco.

It is reported that the master mariners of British Columbia are forming a guild, with objects similar to those of the Imperial Merchant Service Guild. It is proposed to include all certificated masters serving in British Columbia waters, and to adopt a policy which will not be antagonistic to shipowners, but which will be calculated to aid master mariners in matters affecting the efficiency and responsibility of their profession, and to provide legal assistance at marine enquiries.

The Minister of Public Works is considering the plans for a series of proposed improvements in the harbor at Victoria. In the inner harbor the whole area is to be deepened and a number of obstructions removed, and the improvements in the outer harbor comprise the construction of two breakwaters, piers and warehouses with railway accommodation. The Government included $500,000 in the recent estimates for the proposed outer harbor improvements. The proposed dry dock at Esquimalt, to be built by the B.C. Marine Railways Co., will also add considerably to the harbor facilities. The dock will be 1,000 ft. long, 1,000 ft. wide and 34 ft. wide.

At the recent annual meeting of the Shipmasters' Association at Victoria it was decided to ask all shipmasters in British Columbia to forward to the association a list of aids to navigation which, in their opinion, were necessary for the safety of passengers and for facilitating the navigation of freight vessels. The information thus obtained will be tabulated and forwarded to the Marine Department with a recommendation. Following are the chief officers of the association for the current year:—President, L. Rogers; Treasurer, John Newcombe; Secretary, J. R. Stewart.

Telegraph and Cable Matters.

Wireless telegraph messages were exchanged between Canada and Spain, via Poldhu, Cornwall, Eng., Jan. 29.

The Marconi Wireless Telegraph Co., London, Eng., paid a dividend Feb. 1 for six months ended Dec. 31, 1911, on the 7% cumulative participating preference shares.

E. W. Humphrey, President, Northern Commercial Co., Montreal, and at one time connected with the Dominion De-Forrest Wireless Telegraph Co., died at Brooklyn, N.Y., recently, aged 51.

The G.N.W. Telegraph Co. is making arrangements to install eight new motor generators in its Ottawa office, replacing a storage battery plant, which has been in use there for some years.

The Mackay Companies' report for 1911 shows a surplus of $950,838. R. A. Smith, Toronto, and H. C. Meredith, Montreal, were re-elected among the trustees for the current year.

The G.N.W. Telegraph Co. reports that the public is making free use of the reduced rate cable services, and evidently appreciates the reductions through the cable letters, week-end letters and deferred rate messages.

J. W. Baker, lately Manager of the G.N.W. Telegraph Co.'s branch office in the cheese district, Montreal, has been appointed an inspector of the company, covering the eastern portion of the province of Ontario and western portion of the province of Quebec. He was at one time manager for the company at Brockville.

A joint meeting of the eastern and western divisions of the Association of Railway Telegraph Superintendents will be held in Chicago, Ill., Mar. 20. A special meeting of the entertainment committee was held in New York, Feb. 16, when plans were outlined for the entertainment of the members at the annual convention in New York, June 24.

At a meeting of the Canadian Society of Civil Engineers Ottawa branch recently, C. P. Edwards, General Superintendent of the Government Radio Telegraphs, and formerly an assistant on Marconi's technical staff, read a paper on the development of wireless telegraphy, illustrated with diagrams and lantern slides. He attempted to show in as simple a way as possible the general development of the art of wireless telegraphy and the principles on which it depends.

The C.P.R. Telegraph Department will this year erect additional copper wire between Canso, N.S. and Montreal, Montreal and Winnipeg, Winnipeg and Moose Jaw, Sask., Saskatoon, Sask. and Calgary, Alta., via Edmonton, besides several shorter circuits, making a total of about 6,000 miles of new wire. Considerable reconstruction will also take place on various parts of the line in order to keep the system up to standard. Additional telegraph lines will also be erected along the new railway branches to be built during the forthcoming season.

Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time we wish our readers to distinctly understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

American Vanadium Facts, issued monthly by the American Vanadium Co., Pittsgurgh, Pa., has tool steel as the principal subject in its February issue.

The H. W. Johns-Manville Co. has acquired the sole selling agency for the entire products of I. P. Frink, including the Frink reflectors and fixtures.

The Safety Car Heating and Lighting Co.'s monthly pamphlet contains an illustrated article on the indirect lighting method of illuminating passenger cars.

The Baldwin Locomotive Works, Philadelphia, Pa., has acquired the right to build the Garrett type locomotives for service in Canada and the United States. The special feature of these locomotives is that they are of high capacity and will operate on lines having sharp curves.

Lyford, Clark and Lyford, forest engineers, Montreal and Vancouver, have issued a booklet, "Forest Surveys, what they are, wherein they serve, what they cost," which contains considerable interesting and valuable information, and will be found useful to anyone interested in timber properties.

Æmilius Jarvis & Co. have issued the following statement respecting the Canadian Locomotive Co.: "For the first six months ended Dec. 31, 1911, the books show that notwithstanding the unprofitable contract which has formed the bone of contention between Mr. Harty and ourselves and has occupied the plant for the greater part of that time, profits in completed locomotive contracts, interest on the company's investment (amounting to about $17,000 for the period) and miscellaneous earnings total at least $85,000 for the six months; and by June 30 next, the end of the company's fiscal year, with the business at present in hand at profitable prices, the General Manager informs us there is no doubt whatever that the company will have more than earned its full bond interest and preferred stock dividend. In addition, the company will have on hand available as further profits, $105,000, which we and our associates paid it to make good the estimated profits upon the unprofitable contract referred to, the absence of profit upon which we did not know of at the time the old company was taken over and the new securities issued by us. Orders on hand are sufficient to keep the company's plant operating for the entire year 1912, and with additional contracts in sight, considerably beyond that time."

NOTICE TO CONTRACTORS.

The Temiskaming and Northern Ontario Railway Commission.

Toronto, February 24th, 1912.

SEALED TENDERS for the works (other than steel bridges) necessary to the complete construction of the roadbed ready for the ties and rails upon that section of the TEMISKAMING AND NORTHERN ONTARIO RAILWAY COMMISSION'S Railway extending from EARLTON to ELK LAKE, will be received at the office of the Secretary of the Commission, 25 Toronto Street, Toronto, until twelve o'clock (noon), on the twentieth day of March, 1912.

On receipt of a request in writing, a copy of each of the following documents:

Instructions to Bidders,

Form of Tender,

Specifications,

Form of Contract,

will be furnished to intending bidders at the office of the Secretary of the Commission, Toronto; or at the office of the Chief Engineer of the Commission, North Bay, where plans and profiles pertaining to the work may also be seen.

The right is reserved to reject any or all bids.

A. J. McGEE,
Secretary, Temiskaming and Northern Ontario Railway Commission.

NOTICE is hereby given that the Annual Meeting of the Shareholders of the Victoria Rolling Stock and Realty Company of Ontario, Limited, will be held at the offices of Messrs. Osler and Hammond, 21 Jordan Street, Toronto, on Wednesday, March 6, 1912, at twelve o'clock noon, for the reception of the Annual Report and election of Directors for the ensuing year.

By order,
G. T. CHISHOLM,
Secretary.

Toronto, February 12, 1912.

FOR SALE
Barge "Santiago"

Three masted wooden barge in first class condition. Length, 325 ft.; beam, 45½ ft.; depth, 21½ ft.; gross tonnage, 2,600; net tonnage, 2,525; carrying capacity 5,000 net tons on 18 foot draft. Can be inspected at Yacht Club Lagoon, Toledo, Ohio, and full particulars as to price, etc., can be obtained by addressing C. B. Duffy, Pur. Agt., H.V. Ry., Columbus, Ohio.

CALL SWITCHES

We respectfully solicit trial orders for the CALL RAILWAY SWITCHES. Choice of four types, any section or weight.

Full Automatic Switch for main-line service only. This type of switch can be operated by the Engineer when entering siding, and by weight of train when leaving siding. Always set to main-line.

Semi-Automatic Switch — Best for wye service, or when automatic operation is desired from double to single track only.

Yard or Trailing Switch for yard service. This type of switch is unexcelled. It is always automatic when trailing, and saves much time in switching cars.

Hand or Manual Switch—A very strong, durable type and equal to the best.

Several railroads in the United States are now using the **Call Switches**, and they are giving perfect satisfaction.

WRITE FOR PARTICULARS TO

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320 Pacific Building, VANCOUVER, B. C.

DELMAR CAVENDISH COMPANY

FIRE AND MARINE INSURANCE
ON HULLS AND CARGOES
VESSEL BROKERS

PHONE MAIN 1376
" COLLEGE 7563
CONTINENTAL LIFE BUILDING
TORONTO

INSURANCE ON ALL CLASSES OF VESSELS
Effected with
LICENSED COMPANIES. LOW RATES.

Competent Surveyors and Adjusters throughout Canada
Vessels Surveyed — Losses on Hulls and Cargoes Adjusted
VESSELS BOUGHT AND SOLD ON COMMISSION
Marine, Boiler and Employers Liability Insurance

EVERYBODY IS GOING into heavier cars and equipment, and of course heavier Dinkeys. Come along. We are ready for you. All sizes in stock.

VULCAN IRON WORKS

WILKES-BARRE, PA., U.S.A.

Canadian Representatives - MUSSENS LIMITED, MONTREAL
New York Office - - - 50 Church St.

HAS THE COLD SNAP UPSET YOUR SCHEDULE?

PACIFIC TYPE PASSENGER LOCOMOTIVE, EQUIPPED WITH SUPERHEATER, BUILT FOR CANADIAN PACIFIC RAILWAY.

Total Weight of Engine, 221,500 Pounds; Weight on Drivers, 141,200 Pounds; Diameter of Drivers, 75 Inches; Boiler Pressure, 200 Pounds; Cylinders, 21x28 Inches; Maximum Tractive Power, 28,000 Pounds.

With present improved methods of locomotive design 25 per cent. saving in fuel may be counted upon as compared with locomotives of conventional design. This means 33 per cent. more hauling capacity for the same amount of coal as before. Consider the significance of this in winter weather.

Anything which will increase the power output of a pound of coal is worth more in the winter than at any other time of the year. It is more difficult to make schedules because trains are harder to pull. In a winter storm it is most important that the utmost pulling capacity should be had from every shovelful of coal. The value of a margin of power is then most apparent. Here is where features making for economy mean the most, because economy in fuel means more power from the fuel fired. To save coal is important, but to economize in coal to make the coal do more work is more important.

One of the greatest advantages to be gained from recent progress in locomotive design is the ability to cope with winter conditions and discount the difference which cold weather makes in operation.

MONTREAL LOCOMOTIVE WORKS, LTD.

OTTAWA BANK BUILDING, MONTREAL, CANADA

Electric Headlight Saves Train

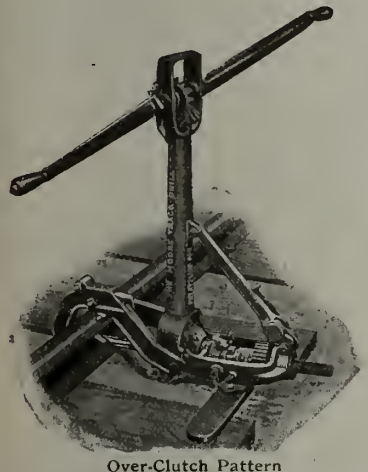
(From Daily Papers)

"Wednesday night B———forgot to deliver an order to hold Eastbound Passenger Train, No 6, and only the fact that the Electric Headlight of the oncoming Passenger train was seen at a great distance by the Engineer of the Westbound Freight prevented a head end collision in the————Canyon near————. The warning light was seen in time to enable the freight to get back on to the siding at————."

PYLE-NATIONAL ELECTRIC HEADLIGHT CO.

CHICAGO

THE MOORE TRACK DRILL



Over-Clutch Pattern

Has been weighed in the balance and NOT found wanting.

It is positively the only drill which can be used in yards and on busy roads without interrupting traffic.

And it has other advantages too numerous to mention in this space.

Write us and we will tell you all about it.

Kalamazoo Railway Supply Co.

MANUFACTURERS, - Kalamazoo, Mich.

Canadian Sales Agent: MUSSENS LIMITED, Montreal

Under-Clutch Pattern

DOMINION IRON & STEEL CO.

LIMITED

MANUFACTURERS OF

BASIC OPEN HEARTH STEEL RAILS

Order Books are now open for delivery during 1912. Intending Purchasers should place orders early to insure prompt delivery.

HEAD OFFICES AND WORKS **SYDNEY, CAPE BRETON, CANADA**

MORISON Suspension Furnaces

The Universally satisfactory record of "THE MORISON" proclaims it the best furnace made.

With Plain Ends or Flanged to any required shape.

For Land and Marine Boilers

Uniform Thickness, Easily Cleaned, Unexcelled for Strength, Unsurpassed for Steaming Capacity.

Manufactured by

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West and Calyer Sts., BOROUGH OF BROOKLYN, New York

Near 10th and 23rd St. Ferries

Canadian Sales Representatives: THOS. ROBERTSON & CO. LTD., 134 Craig St., Montreal.

A HISTORY OF THE PAY-AS-YOU-ENTER CAR

AND ITS LESSON

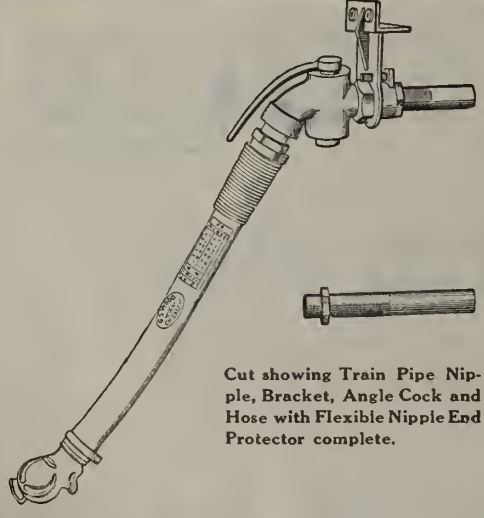
The following cities are using Pay-As-You-Enter Cars: Chicago City Railway, 839 cars; Chicago Railways, 1,328; Public Service Corporation of New Jersey, 466; New York City Railway, 555; Third Avenue Railroad, New York, 550; International Railway, Buffalo, 200; Buffalo & Lake Erie Traction Co., 10; Washington Ry. & Elec. Co., Washington, D.C., 100; Capital Traction Co., Washington, D.C., 51; Municipal Traction Co., Cleveland, Ohio, 180; United Rys. Co. of St. Louis, Missouri, 310; Portland Ry., Lt. & Pwr. Co., Portland, Ore., 25; Columbus Ry. & Lt. Co., Columbus, Ohio, 10; Wichita R.R. & Lt. Co., Wichita, Kan., 14; Jacksonville Elec. Co., Jacksonville, Fla., 5; Dallas Elec. Co., Dallas, Texas, 20; Houston Elec. Co., Houston, Tex., 41; Northern Texas Trac. Co., Ft. Worth, Texas, 25; Ithaca Street Ry., Ithaca, N.Y., 2; Peoria Street Ry., Peoria, Ill., 13; Urbana & Champaign Ry., Champaign, Ill., 3; Mutual Lt. & Water Co., Brunswick, Ga., 4; Rochester Ry. Co., Rochester, N.Y., 25; Ft. Dodge, Des Moines & So. R.R. Co., 2; Muskogee Elec. Trac., Muskogee, Okla., 6; Union Traction Co., Dubuque, Ia., 4; Topeka Ry. Co., Topeka, Kas., 12; United Rys. & Elec. Co., Baltimore, Md., 32; Detroit United Ry., Detroit, Mich., 225; Cincinnati Traction Co., Ohio, 50; Montreal Street Railway, 400; British Columbia Elec. Ry., 30; Calgary Street Railway, 18; Metropolitan Street Ry., Kansas City, Mo., 50; Edmonton Radial Ry., 4; San Antonio Traction Co., San Antonio, Tex., 6; Rockford & Int. Ry., Rockford, Ill.; Cairo Street Ry. & Lt. System, 6; Des Moines City Railway, Iowa, 12; Macon Ry. & Lt. Co., Macon, Ga.; Virginia Ry. & Power Co.; Columbia Elec. St. Ry. & Lt. & Power Co., Columbia, S.C.; Aurora, Elgin & Chicago Ry., Chicago, Ill.; Wichita Falls Traction Co., Wichita Falls, Tex.; Ottawa Electric Ry. Co., Ottawa; Bloomington & Normal Ry. & Lt. Co., Bloomington, Ill.; Corsicana Transit Co., Corsicana, Tex.; Compania Electrica y de Ferrocarriles, Mexico; The Milwaukee Elec. Ry. & Lt. Co., Milwaukee, Wis.; Springfield Street Ry. Co., Springfield, Mass.; Lynchburg Traction Co., Lynchburg, Va.; Chicago & Southern Traction Co., Chicago, Ill.; Calumet & South Chicago Ry. Co., Chicago, Ill.

THE LESSON

taught by this widespread use of Pay-As-You-Enter Cars is obvious. Increased Revenue, Accident Elimination and Schedule improvement have been demonstrated in every case. Isn't all this sufficient to show that it always pays to operate the Pay-As-You-Enter Car? Why not remodel some of your present cars?

We license manufacturers and railways to build and use the Pay-As-You-Enter Car, the Patents on which are owned by

ROSS & McDONALD, PATENTEES, - - 78 CRAIG STREET WEST, MONTREAL



Cut showing Train Pipe Nipple, Bracket, Angle Cock and Hose with Flexible Nipple End Protector complete.

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WOOD'S FLEXIBLE NIPPLE END PROTECTOR

FOR AIR-BRAKE AND SIGNAL HOSE

Prevents chafing and abrasion effecting a saving of from 40 to 50% in maintenance of air-brake hose.

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will absolutely stop shifting and leaking of air-brake train pipes. All M.C.B. requirements are obtained and maintained.

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FOR AIR-BRAKE AND PNEUMATIC TOOL HOSE

will prevent cracking of rubber cover and deterioration due to climatic changes. Easily applied.

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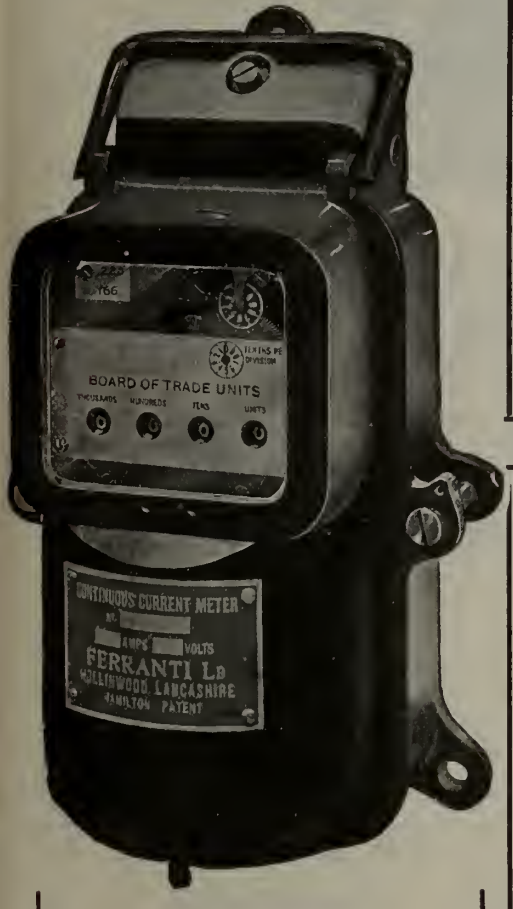
TRACTION METERS

The demand for Car Meters has grown very rapidly and the economies effected by the installation of these instruments have more than justified their use.



The guaranteed accuracy of the Ferranti Traction Meter is 2½ per cent. from full load to 1-10th load.

Will stand 100 per cent. overload for ten minutes.

Interesting data and attractive prices furnished on application to

Canadian Representative

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Boilers - Horizontal Tubular
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Tanks - Iron or Steel of all Kinds.
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We make a specialty of welded Tanks, without rivets or seams.

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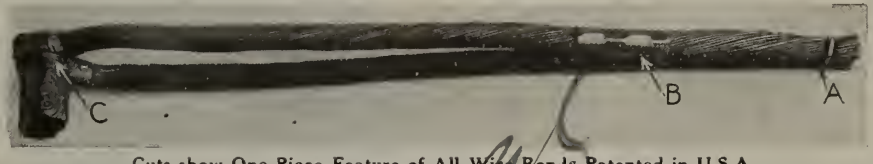


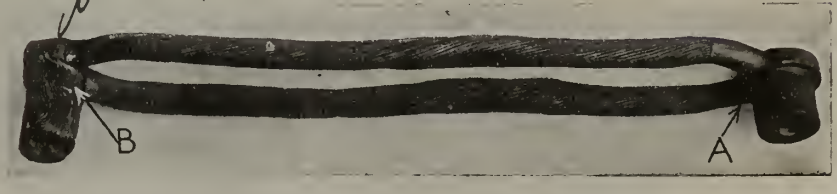
Cuts show One Piece Feature of All Wire Bonds Patented in U.S.A.

Joints made by attaching terminals of a bond to the body are *joints*.

In ALL WIRE RAIL BONDS the terminals are formed out of the body of the bond itself—hence our One Piece Feature—result, *NO JOINTS.*

Four "joints" per bond (of other makes) mean 1408 *unnecessary joints* per mile of track.

You would not use a feeder cable that had splices every few feet, no matter how perfect the joints were—why not select *One Piece* Rail Bonds also? Let us tell you the *whole* story.



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EDISON BSCO PRIMARY BATTERY

for railway service—the first assembled-in-one copper oxide battery made.

Every railway signal engineer and purchasing agent should have the complete imformation we have gathered regarding the service of Edison BSCO Primary Batteries in use on many of the great railroads throughout the country. This information will tell you that the Edison is easily the most reliable, as well as by far the most economical.

The operation of making renewals is much more simple and more rapidly effected than in other batteries—and renewals cost less, considering service obtained.

Reliability is the first thing for you to consider in your battery service—and economy, the second. The Edison BSCO is the railway signal battery in which you are certain of both.

Thomas A. Edison, Inc.
51 Lakeside Ave., Orange, N. J., U. S. A.

Steel Castings

One of the two largest steel castings ever made in Canada was cast by us. They were Y-pipe connections for a 10,500 H.P. water wheel. We made it for the John McDougall Caledonian Iron Works, and they were thoroughly satisfied.

Absolute Satisfaction is Guaranteed

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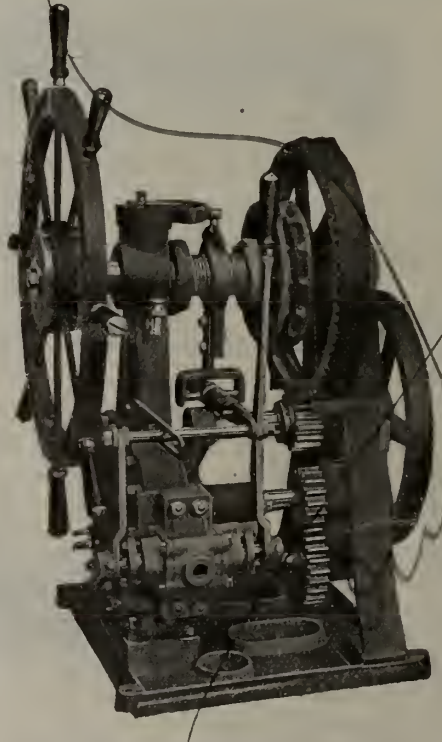

Steam Anchor Windlasses

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Also Hoists of all kinds

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Write for catalogue and prices.

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DAKE ENGINE CO., Grand Haven, Mich.

NORTH AMERICAN LIFE

REPORT FOR 1911

The Thirty-first Annual Meeting of the Company was held at its Home Office in Toronto, on Thursday, Jan. 25th, 1912, when the report of the business of the year ended Dec. 31st, 1911, was presented.

CASH INCOME

The Cash Income during the year from premiums, interest, etc., was $2,295,176.98, showing a large increase over the previous year.

PAYMENTS TO POLICYHOLDERS

The amount paid on Policy-holders' Account was $988,313.49, of which sum $148,135.09 was for surplus or dividends. The relative importance of the policy-holders' interests is at once apparent, considering that the sum of $6,000 only was paid to Guarantors. Holders of Deferred Dividend Policies received $501,399.96. This item, including Reserve and Surplus, shows an increasing amount from year to year. It is an incident of the Company's growth and progress, and affords ample evidence that the business is being conducted for the benefit of the policy-holders.

ASSETS

The Assets increased in 1911 by $924,334.25, and now amount to $12,313,107.57. The Bonds and Stocks owned by the Company are carried, as heretofore, at their cost price, although the market value was $168,575.72 in excess thereof, for which credit has not been taken.

NET SURPLUS

After making provision for all liabilities and further strengthening the reserves, the Net Surplus was increased to $1,300,784.00. This shows a handsome increase over the surplus of last year, and at once establishes the unexcelled financial condition of the Company.

INSURANCES INCREASED

The policies issued during the year, together with those revived, amounted to the sum of $6,129,426, being an increase of $1,019,367 over that of the previous year. The total business in force amounts to $45,849,515.

L. GOLDMAN, Managing Director. J. L. BLAIKIE, President.

Car Wheel Economy that Means Something

Pay 10c more per 100 lbs. of wheel and save $200 on every $1,000 you invest in chilled wheels. In other words, buy wheels made of iron purified by Titanium Alloy. They give at least 20 per cent. more mileage than ordinary chilled wheels.

TITANIUM

The Wonder-Working Alloy

is added in the cupola. It closes the grain of the metal; makes it denser, tougher and less brittle. Titanium Alloy is used and endorsed by the best known wheel manufacturers and railways in the country.

Booklet No. 30 will prove profitable reading. Send for it.

Titanium Alloy is made for Canadian Consumption by Electro Metals, Ltd., Welland, Ont.

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Manufactured in Canada under Rossi Patents. Processes and Products Fully Patented

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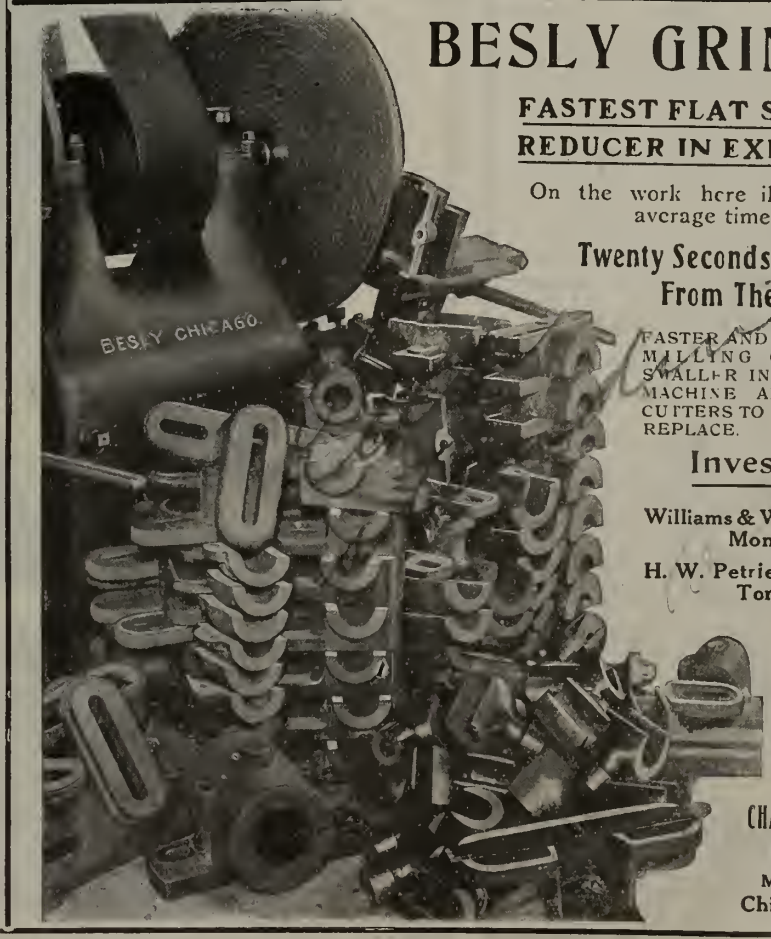
Pacific Coast Agents, ECCLES AND SMITH CO., Los Angeles, San Francisco and Portland.

H. H. COOK, District Agent, People's Gas Bldg., Chicago, Ill.

PRIMOS CHEMICAL CO., Primos, Del. Co., Pa.



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FASTEST FLAT SURFACE REDUCER IN EXISTENCE

On the work here illustrated, the average time was

Twenty Seconds Per Surface, From The Rough

FASTER AND BETTER THAN MILLING OR PLANING—SMALLER INVESTMENT IN MACHINE AND JIGS—NO CUTTERS TO SHARPEN AND REPLACE.

Investigate

Williams & Wilson, Agents, Montreal.

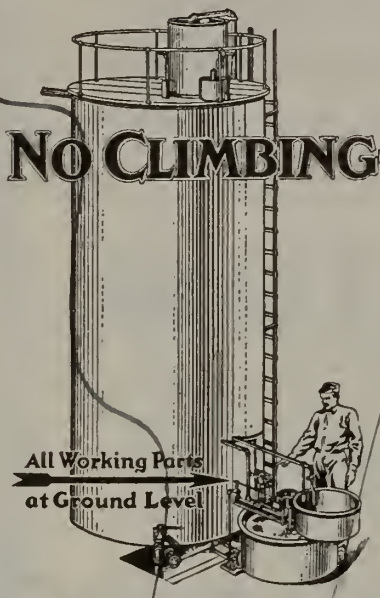
H. W. Petrie, Ltd., Agents, Toronto.

CHARLES H. BESLY & COMPANY

Manufacturers

Chicago, U.S.A.

BOOTH WATER SOFTENERS



What You Should Know

(1) Boiler Maintenance—
One $10,000 softener saved $250 per month—30 per cent. on investment.

(2) Saving in Fuel—
One $1,500 softener saved $4,888 yearly in coal—over 300 per cent. on investment. Another softener reduced fuel consumption 20 per cent.

(3) Washing Out Boilers—
Stationary boilers washed out once in 168 days; before using softener, once in 7 days.

(4) Cost of Purifying Water
The average cost is from one to three cents per 1,000 gallons, depending on hardness of water.

We have data on softeners in operation to prove these and other conclusive statements.

WRITE US.

L. M. Booth Company
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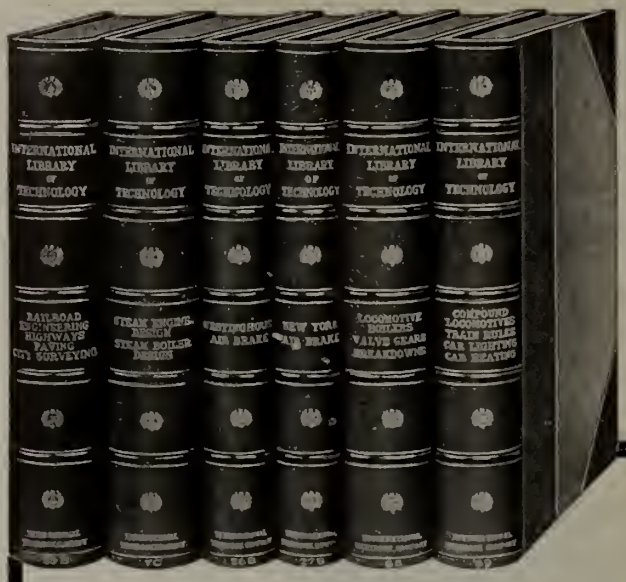

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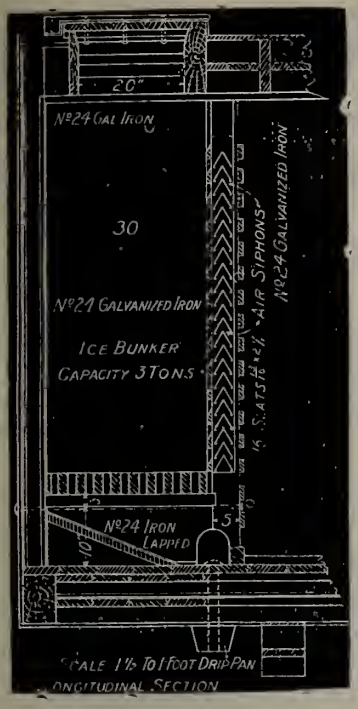

Longitudinal Section of Car.

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THE ORIGINAL AND ONLY PATENTED DRY AIR SIPHON SYSTEM

FOR REFRIGERATORS AND DINING CARS

The original Dry Air Siphon System. It gives strongest circulation of air. Consumes least ice. Strongest and most durable. Costs least to maintain. Every tank guaranteed.

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And many others.

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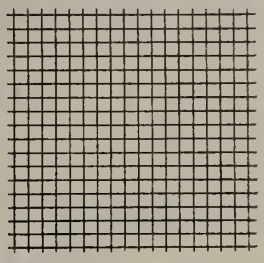

for Car Ventilators

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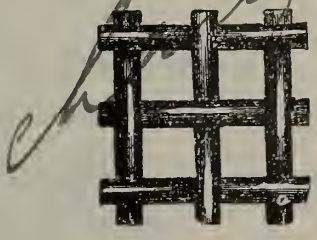

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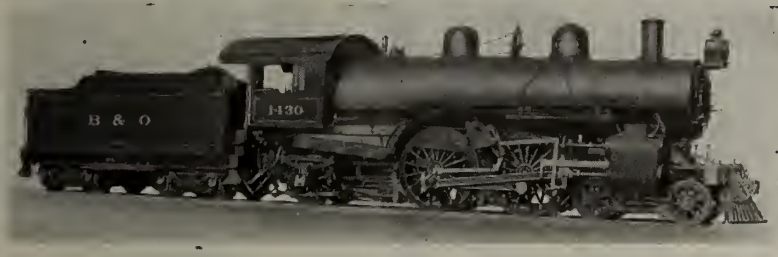
Cable Address;—"Baldwin, Philadelphia"



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ELECTRIC MOTOR AND TRAILER TRUCKS

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ESTABLISHED 1849.

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Capital and Surplus, $1,500,000.

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CAST IRON PIPE

8 Inches to 60 Inches diameter

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MALLEABLE IRON AND STEEL CASTINGS FOR RAILROAD USE

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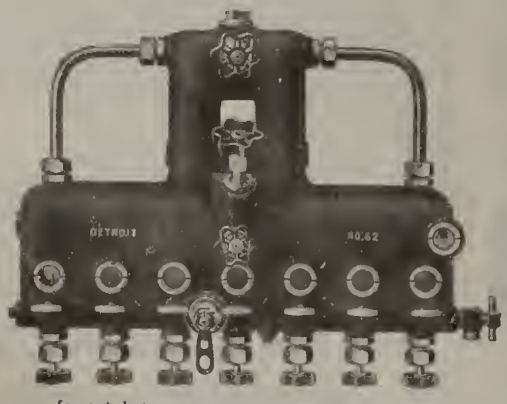
Detroit Lubricators for every Locomotive



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They are made with two, three, four, five, six and seven feeds for simple, compound, Mallet compound, superheater Mallet compound, Shay—all kinds of locomotives — with special provision for controlling the lubrication of one or more air pumps, mechanical stoker and intercepting valve.

The new Detroit Bullseye locomotive lubricator with oil control valve will give every part of any locomotive efficient, dependable and economical lubrication.

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Canadian Agents, Taylor & Arnold, Ltd. 404 St. James St., Montreal.

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Shortest, Quickest and Best Line between

MONTREAL AND NEW YORK

TRAVEL IN COMFORT

Through Pullmans

Excellent Cafe Car or Buffet Service

Convenient Schedules

Trains leave Montreal 7.40 daily, 8.45 a.m. and 10.55 a.m. except Sunday.

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D. W. ALEXANDER, Manager for Canada
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For High Class

Water Turbines

Steel or Iron

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Marine Repairs

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of all descriptions to stock or special design, apply to

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Johnson Car Replacers

Straddles the rail—needs no spikes, clamps or fasteners.
Rests on rail both front and rear.
Adjusts itself to different heights of rail.
Forms a friction grip with rail during the operation.
Brings rails to gauge during replacement.
Distributes the load on the Rail, not one or two ties.
Special types for Steel-ties and Street Car Rails.

The Johnson Wrecking Frog Co.

CLEVELAND, OHIO, U.S.A.
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Type Z right hand

CHICAGO RAILWAY EQUIPMENT CO.

RECO

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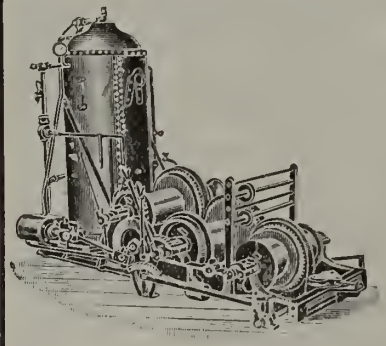

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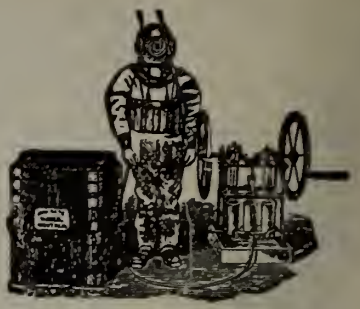

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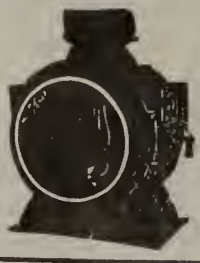

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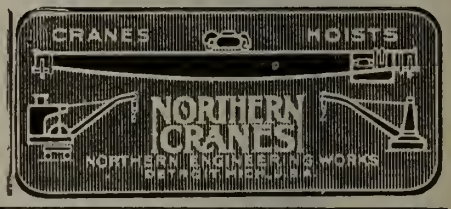

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Imperial Wire and Cable Co.....Montreal

Wire, Electric
Chapman & Walker, Ltd .....Toronto.
E. F. Phillips Elec. Works, Ltd...Montreal.
Imperial Wire and Cable Co.....Montreal

Wire Goods, Bright
Steel Co. of Canada, Ltd. ..Hamilton, Ont.

Wire, Insulated, Copper
Canadian Gen. Elec. Co., Ltd....Toronto
Canada Wire & Cable Co., Ltd. ..Toronto.
E. F. Phillips Elec. Works, Ltd...Montreal.
Imperial Wire and Cable Co.....Montreal

Wire, Telegraph and Telephone
Canada Wire & Cable Co., Ltd....Toronto.
Chapman & Walker, Ltd .....Toronto.
E. F. Phillips Elec. Works, Ltd...Montreal.
Imperial Wire and Cable Co.....Montreal

Wire, Transmission and Trolley
Canada Wire & Cable Co., Ltd....Toronto.
Chapman & Walker, Ltd .....Toronto.
Imperial Wire and Cable Co.....Montreal

Wrenches, Cast Steel
American Brake Shoe & Fdry. Co.Mahwah.

Yachts
Polson Iron Works, Ltd. .....Toronto.

Ticket Agents Connecting Lines

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ILLINOIS CENTRAL RAILROAD — CENTRAL MISSISSIPPI VALLEY ROUTE

Carries Through Sleeping Cars, Free Reclining Chair Cars or Coaches to

CHICAGO	MEMPHIS
ST. LOUIS.	NEW ORLEANS
OMAHA	HOT SPRINGS
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True Southern Route to Pacific Coast.
Through Trains Electric Lighted.

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220 Ellicott Square, Buffalo, N.Y.

DORNER RAILWAY EQUIPMENT CO.

Irving Park Ave., corner Southport,
CHICAGO, U. S. A.

Rebuilt Cars
Engines
and
Generators

New Seamless Steel Trolley Poles

THE CANADIAN PACIFIC RAILWAY COMPANY.

Dividend Notice.

At a meeting of the Board of Directors held to-day the following dividends were declared:—

On the Preference Stock two per cent. for the half year ended 31st December last.

On the Common Stock two and one-half per cent. for the quarter ended 31st December last, being at the rate of seven per cent. per annum from revenue and three per cent. per annum from interest on proceeds of land sales and from other extraneous assets.

Both dividends are payable 1st April next to Shareholders of record at 3 p.m. on 1st March next.

By order of the Board.

W. R. BAKER,
Secretary.

Montreal, February 12th, 1912.

J-M ASBESTOS & MAGNESIA RAILROAD SUPPLIES

Roofings	Locomotive Lagging	Pipe Coverings	Electrical Supplies
Shingles	Air Brake Cylinder	Smoke Jacks	Overhead Line Material
Packings	Packing Expander Ring	Asbestos Wood	Rail Bonds and Tools
Gaskets	Underground Conduit	Fibre Conduit	"Noark" Fuse Devices
Hair Felt	Leak-No Metallic Compound	Insulation	Fuse, Service & Subway Boxes,
Cements	Fire Extinguishers	Metal Polish	etc., etc.

WRITE NEAREST BRANCH FOR CATALOG NO. 252.

THE CANADIAN H. W. JOHNS-MANVILLE CO., LIMITED.

Toronto, Ont. London, Ont. Montreal, Que. Winnipeg, Man. Vancouver, B.C.

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DUNER CO. 101 S. Clinton St. Chicago

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*Advertisers marked with an asterisk appear in alternate issues.

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"B. & W." 30 Tons Electric Travelling Goliath Crane, 70 Feet Span

BABCOCK & WILCOX
LIMITED
PATENT
Water Tube Steam Boilers
7,800,000 h.p. Land & 2,010,000 h.p. Marine } In use or on order
Babcock & Wilcox also Manufacture
ELECTRIC CRANES
FOR DOCKS, RAILWAYS AND WAREHOUSES
White-Forster Water-Tube Marine Boilers
HEAD OFFICE FOR CANADA:
St. Henry, MONTREAL
TORONTO OFFICE
Traders Bank Building

"BROWNHOIST" LOCOMOTIVE CRANES

"Brownhoist" Crane Coaling Engine on N. Y., N. H. & H. R. R. from cars on side track.

A RAPID AND ECONOMICAL METHOD of handling coal from car to engine or from car to coal tipple. The crane coals the engine while it is being cleaned on the ashpit. It cleans the pit, placing the ashes into the car. Many roads use the crane to fill the pockets on their coal chutes. Time and money are saved on both of these methods of coaling an engine.

ON CONSTRUCTION WORK the crane is a labor saver. The crane excavates, drives piling with a pile-driver, handles construction material of all kinds, switches the cars, places heavy steel structures, and does all the lifting and moving of material.

AROUND THE SHOP AND YARD the crane handles ALL material. It can be equipped with either grab bucket, bottom block, or lifting magnet. Either one is easily and quickly applied.

"Brownhoist" Cranes are built for hard and continuous service.

Catalogs and Full Information sent on request.

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Manufacturers of all kinds of Hoisting Machinery

Main Office and Works: CLEVELAND, OHIO.

Branch Offices: NEW YORK PITTSBURG SAN FRANCISCO

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LIMITED

FREIGHT AND PASSENGER CARS

(STEEL, WOOD OR COMPOSITE)

BUILT TO OUR OWN DESIGNS OR TO PURCHASERS' SPECIFICATIONS

STEEL UNDERFRAMES

Simplex Bolsters and Brake Beams
Susemihl Frictionless Side Bearings
Cast Steel Couplers **Car Forgings**
Axles **Car Wheels** **Springs**
Malleable Castings

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WORKS:

TURCOT, QUE. **MONTREAL WEST, QUE.** **AMHERST, N.S.**

The Railway and Marine World

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The Railway and Shipping World, Established 1890

Devoted to Steam and Electric Railway, Marine, Grain Elevator, Express, Telegraph, Telephone and Contractors' Interests

TORONTO, CANADA, APRIL, 1912.

For Subscription Rates See Page 187.

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Successors to THE WIRE AND CABLE COMPANY, MONTREAL

Electrical Wires and Cables for all Purposes—Paper and Rubber Insulated Lead Covered Cables; Rubber Covered Wire; Weather-Proof Wire; Flexible Lamp Cord; Bare Copper Wire, Etc. : : : :

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For Steam and Electric Railways, Express, Telegraph and other purposes

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Electric Cars, Fine Carriages, Wagons, Sleighs, Etc.

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800 ROOMS

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SMALL TOOLS

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Prompt delivery from stock.

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Canned Lightning for quick and easy stripping of varnished or painted surfaces. Harmless to wood or health.

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VARNISHES of Finest Quality

MONTREAL - - - CANADA

Associated with Murphy Varnish Co., U.S.A.

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A composition for the sanitary treatment of concrete or cement.

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Purchasing Agents' Guide, Page 53.

Westinghouse Belt Driven Air Compressor

Cross Section of 5 x 4 inch Belt Driven Compressor for Light Industrial Work

CHANGE

Special Publication No. 9012
"Westinghouse Air Compressors"

is a valuable hand book for users of air in moderate quantities. It illustrates and describes Westinghouse Compressors, and contains useful tables. Ask our nearest office for a copy.

Canadian Westinghouse Company, Limited

General Office and Works : HAMILTON, ONTARIO.

ADDRESS NEAREST OFFICE

Toronto, Traders Bank Building — Halifax, Telephone Building — Calgary, 311 Eighth Ave West
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Westinghouse Motor Driven Air Compressor

New Air Brake Compressor

This new Type AA-7 Compressor is specially designed for severe service. An insulation test of 2,000 volts for one minute for live parts to ground is made on every motor. All tests mechanical and electrical, are sufficiently severe to insure absolute reliability.

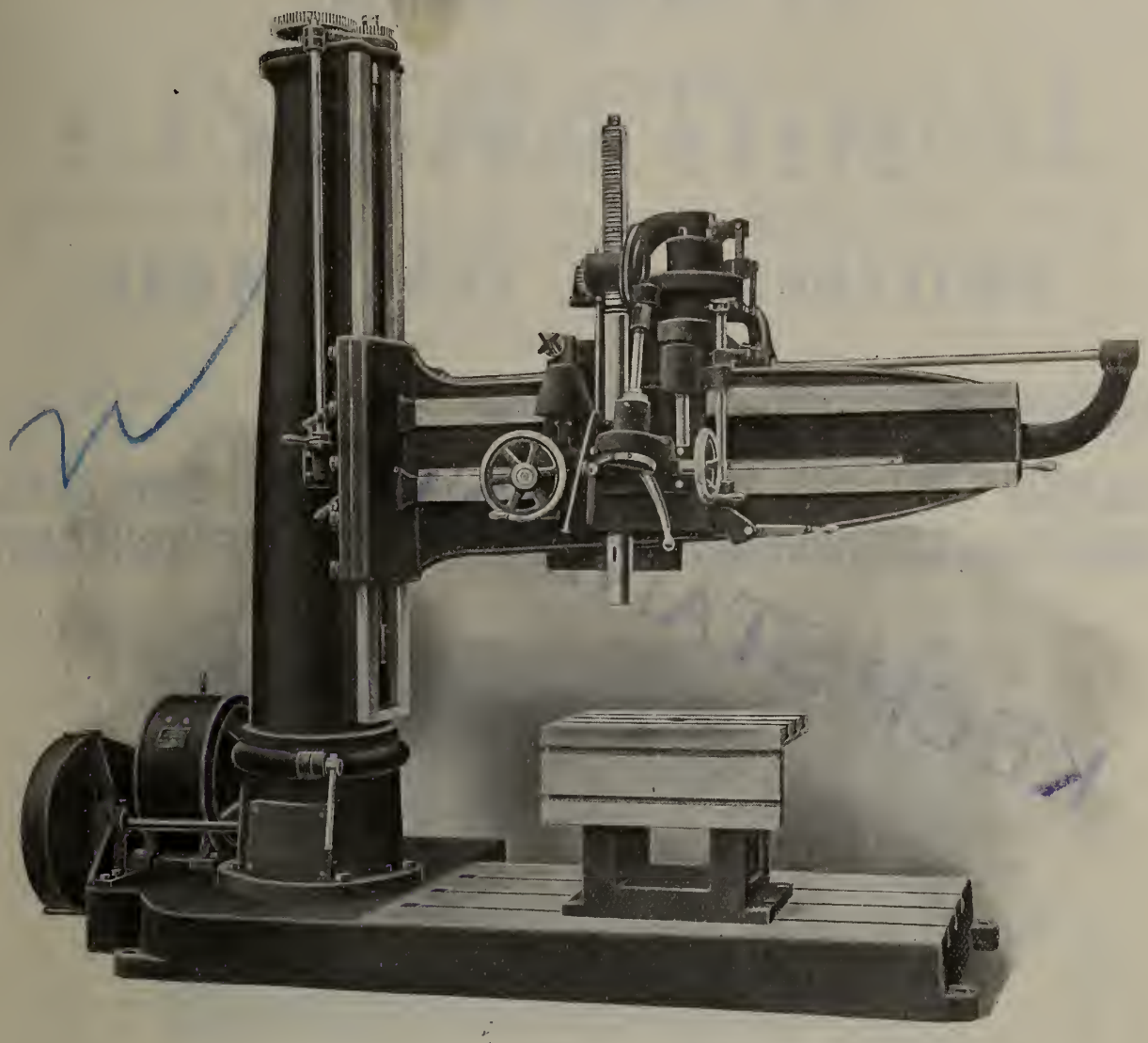
See Bulletin 1525.

ALLIS-CHALMERS-BULLOCK

LIMITED

Works: MONTREAL. Sales Offices:—Montreal Toronto Winnipeg Calgary Vancouver

Drills ! Drills ! Drills !



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LIMITED

GALT, ONTARIO

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MANUFACTURERS OF

STEEL CASTINGS

Acid Open Hearth System — Basic Open Hearth System

SWITCHES AND TRACK WORK

For Steam and Electric Roads

MANGANESE STEEL CASTINGS

For Wearing Parts, insuring Great Hardness and Durability

ELLIPTIC AND COIL SPRINGS OF ALL KINDS, BAR STEEL ANGLES, INTERLOCKING PLANTS, TRUCKS FOR ELECTRIC CARS

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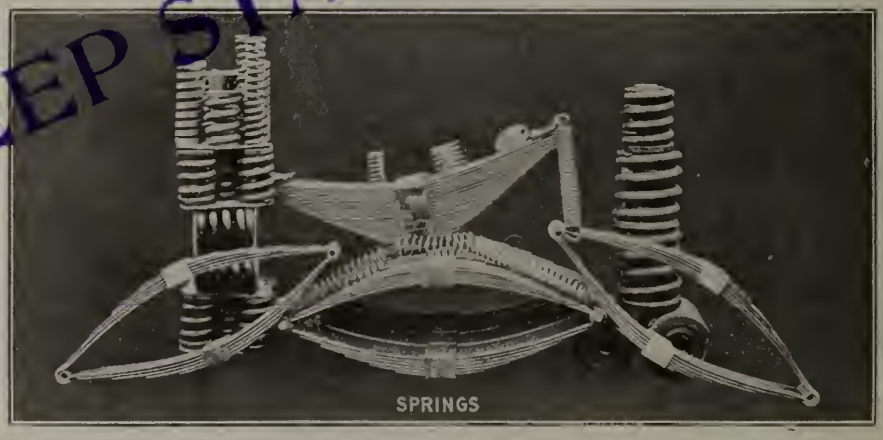

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Manufacturers of Tee Rails, Fish Plates, Etc.

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For Every Class of Service

Pole Brackets and Fittings
Suspensions of all types
Soldered, Clinch and Mechanical Ears
Splicing Sleeves
Strain Insulators
Feeder Wire Insulators
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Rail Bonds

Designed to **meet** the most Severe Service. Made of the **Best Materials** and subject to **Thorough Factory Inspection**

Our facilities are also excellent for handling orders for other miscellaneous construction and equipment supplies, such as the following lines :

Bolts, Nuts and Washers **Guy Anchors** **Galvanized Strand**
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High Potential Insulators and Accessories **Luminous Headlights**
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A Large Stock carried at each branch office

Canadian General Electric Co.

Limited

Toronto **Montreal** **Halifax** **Ottawa** **Cobalt**
Winnipeg **Calgary** **Vancouver** **Nelson** **Prince Rupert**

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STEEL COMPANY OF CANADA
LIMITED

Railroad Track Equipment

Angle Bars Tie Plates

Steel Track Spikes Bolts & Nuts

PIG IRON

Foundry Basic Malleable

Car Axles and Forgings

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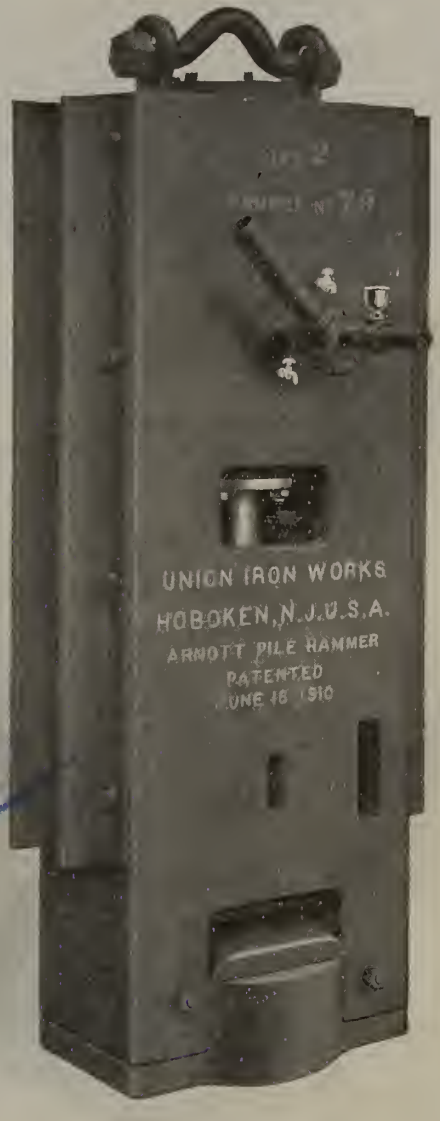
Double Acting -- Rapid Stroke

ARNOTT PILE HAMMERS

CHANGE

For Steam or Air

Made in 8 sizes. For the lightest sheeting or the heaviest concrete pile. : : :



ARNOTT HAMMER
Fitted with Detachable Angle Guides and Round Pile Base for Wood Piles.

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HEAD OFFICES : MONTREAL

Branches : Toronto Cobalt Winnipeg Calgary Vancouver

HAS THE COLD SNAP UPSET YOUR SCHEDULE?

PACIFIC TYPE PASSENGER LOCOMOTIVE, EQUIPPED WITH SUPERHEATER, BUILT FOR CANADIAN PACIFIC RAILWAY.

Total Weight of Engine, 221,500 Pounds; Weight on Drivers, 141,200 Pounds; Diameter of Drivers, 75 Inches; Boiler Pressure, 200 Pounds; Cylinders, 21x28 Inches; Maximum Tractive Power, 28,000 Pounds.

With present improved methods of locomotive design 25 per cent. saving in fuel may be counted upon as compared with locomotives of conventional design. This means 33 per cent. more hauling capacity for the same amount of coal as before. Consider the significance of this in winter weather.

CHANGE

Anything which will increase the power output of a pound of coal is worth more in the winter than at any other time of the year. It is more difficult to make schedules because trains are harder to pull. In a winter storm it is most important that the utmost pulling capacity should be had from every shovelful of coal. The value of a margin of power is then most apparent. Here is where features making for economy mean the most, because economy in fuel means more power from the fuel fired. To save coal is important, but to economize in coal to make the coal do more work is more important.

One of the greatest advantages to be gained from recent progress in locomotive design is the ability to cope with winter conditions and discount the difference which cold weather makes in operation.

MONTREAL LOCOMOTIVE WORKS, LTD.

OTTAWA BANK BUILDING, MONTREAL, CANADA

The Statement Of A Railroad Storekeeper

Cut 52B

Here is a report made by Mr. J. P. Murphy, General Storekeeper for the L.S. & M.S.R.R.:—

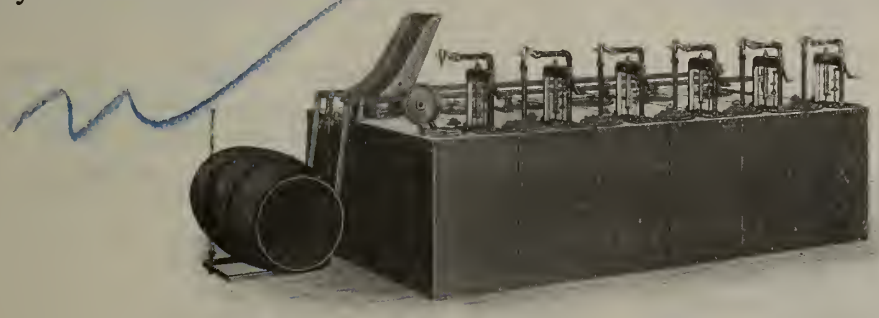
"In the handling of oils the Bowser System is being used extensively, and with it, at every engine house where it has been installed, we have been able to DECREASE *our forces* TWO MEN, *one night and one day, as it has been entirely possible to have the supply man deliver the oils in addition to his other duties. The pumps are located so the oils and supplies are delivered over the same counter."*

The above is copied verbatim from his report to the convention. This shows the economy of the Bowser System under actual working conditions.

Why can't you save the labor of *two men* and maintain absolute accuracy in your oil department?

Marine Oil Storage

There is no place where more scrupulous care should be used than on steam ships, etc., not alone for the sake of cleanliness and economy, but a dirty engine-room is always a constant fire hazard.



Battery of Cut 64'S

The Bowser System has been especially designed for marine use. When desired the pumps are trimmed in polished brass to harmonize with the fittings in the engine-room.

Why not get our literature on this matter and see just how much improvement can be made in handling your oil? Ask for catalogue No. 18.

S. F. Bowser & Co., Inc., Toronto, Ont. 66-68 Frazer Avenue

For twenty-seven years manufacturers of self-measuring oil pumps and tanks, gasoline and oil storage systems, self-registering pipe line measures, oil filtration and circulating systems, etc.

VANADIUM

The Steel of Ultimate Quality

Elasticity Strength Toughness Endurance

Heat Treated Vanadium Steel Locomotive Main Side Rod—
Bent Cold Under Drop Test without Fracture.

CHANGE

Elastic limit	70,000 lbs.
Ultimate Tensile Strength	90,000 "
Elongation in 2"	20%
Reduction	50%

Vanadium is the only element that greatly increases the elastic limit and dynamic strength of steel without impairing its ductility.

OVER 2,000 VANADIUM STEEL CONNECTING RODS IN SERVICE

in the fastest passenger, and heaviest freight locomotives.

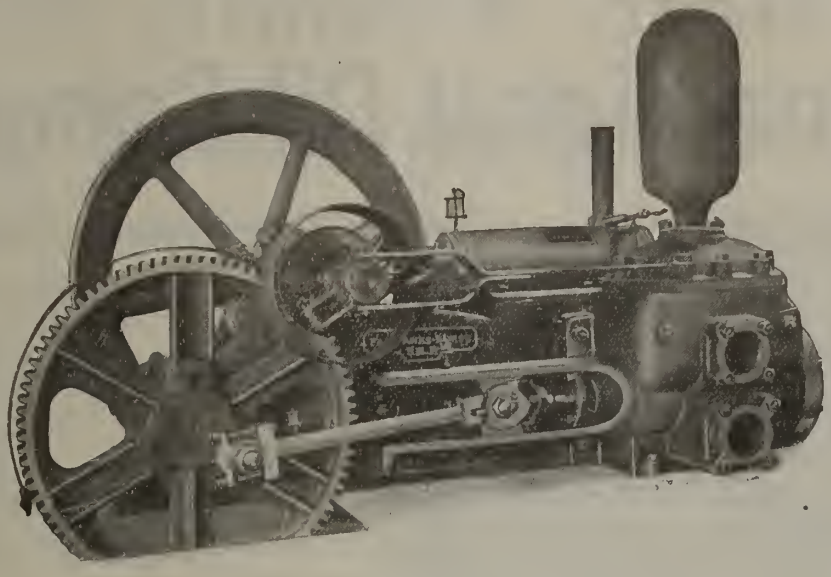
BOOKLETS AND EXPERT ADVICE ON APPLICATION

American Vanadium Company

Manufacturers of Ferro Vanadium — Immediate shipment; any quantity

324 Frick Building, - PITTSBURGH, Penna.

LONDON PARIS PITTSBURGH

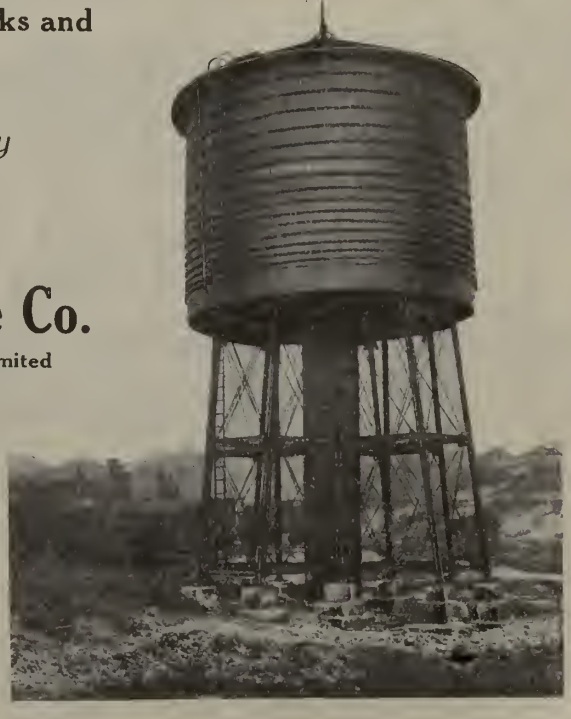


FAIRBANKS - MORSE

Combined Gasoline Engine and Pump

Our Water Station Equipment will reduce your expenses, such as attendance, maintenance and fuel cost to a minimum. A great advantage in this system, whether for railroads water station or for town waterworks, is the little attendance necessary. A section foreman or a station agent can look over the engine and start it before taking up his other duties.

We contract for complete erection of these tanks and the furnishing of pumping machinery.



The Largest Railway and Mill Supply House in Canada.

The Canadian Fairbanks-Morse Co.

Limited

Fairbanks Standard Scales
Fairbanks-Morse Gas Engines

Montreal	Vancouver
Toronto	St. John, N.B.
Winnipeg	Saskatoon
Calgary	Ottawa

Galena-Signal Oil Company

Franklin, Pa., and Toronto, Ont.

Sole manufacturers of the celebrated GALENA COACH, ENGINE and CAR OILS, and SIBLEY'S PERFECTION VALVE and SIGNAL OILS.

GUARANTEE COST per thousand miles for from one to five years, when conditions warrant it.

Maintain EXPERT DEPARTMENT, which is an organization of skilled railway mechanics of wide and varied experience. Services of Experts furnished free of charge to patrons interested in the economical use of oils.

STREET RAILWAY LUBRICATION A SPECIALTY

USE

Galena Railway Safety Oil "B"

in Marker and Classification Lamps, to secure Efficiency of Service, Maximum Candle Power, Clearness of Light.

Galena Long Time Burner Oil

for use in Switch and Semaphore Lamps, and all lamps for long time burning, to avoid smoked and cracked chimneys and crusted wicks.

Tests and correspondence solicited.

S. A. MEGEATH,

PRESIDENT

The Simmen System

of Railway Signalling and Train Despatching

This System Combines all the features of

Telephone Train Despatching

with

"REMOTE CONTROL" BLOCK SIGNALS

Despatcher's Table

A Permanent Record in the Despatcher's office is automatically and continuously made and shows the exact position of trains at all times.

All Signals from Despatcher are made Direct to Train Crew (without any intermediary.)

Switches on Despatcher's Table are INTERLOCKED and clear opposing signals are rendered absolutely impossible.

Track Capacity is increased and double tracking may be delayed correspondingly.

Passing sidings, being all in electric communication with Despatcher, become equivalent to telegraph stations with day and night operators.

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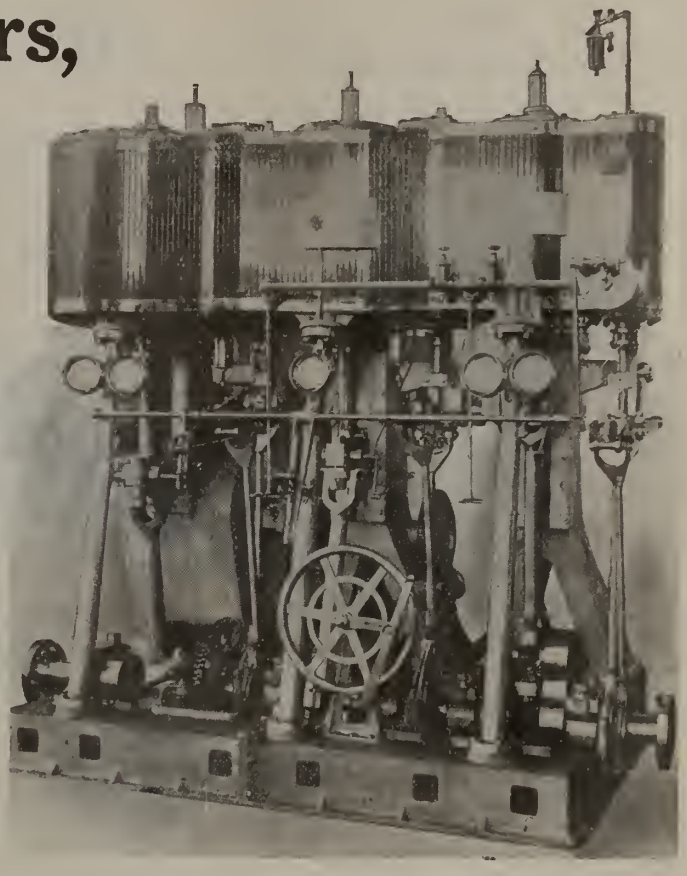

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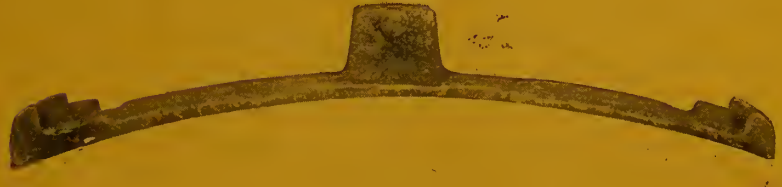

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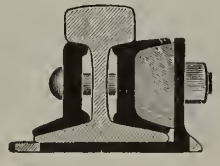
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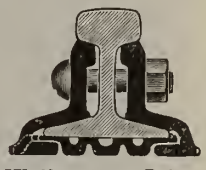
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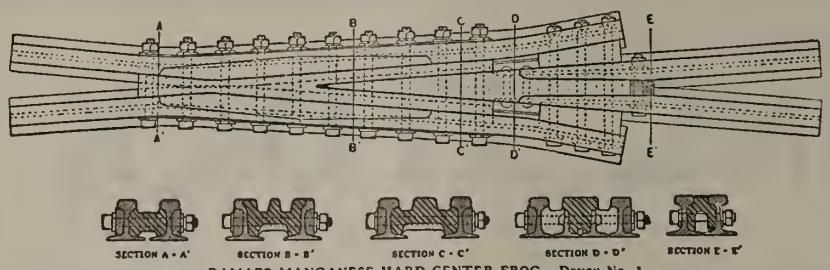

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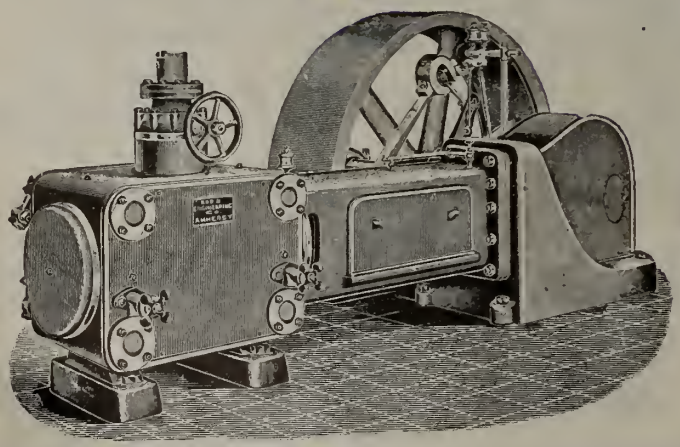

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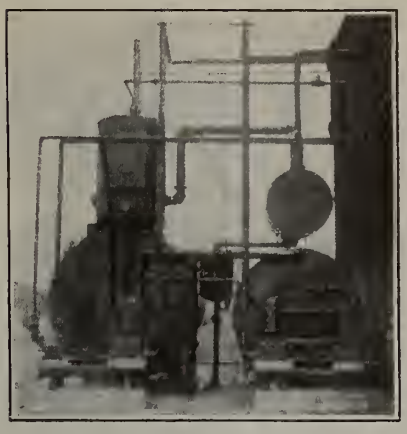

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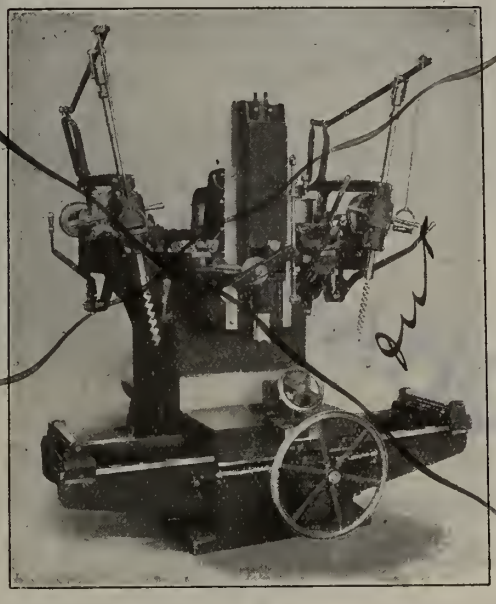

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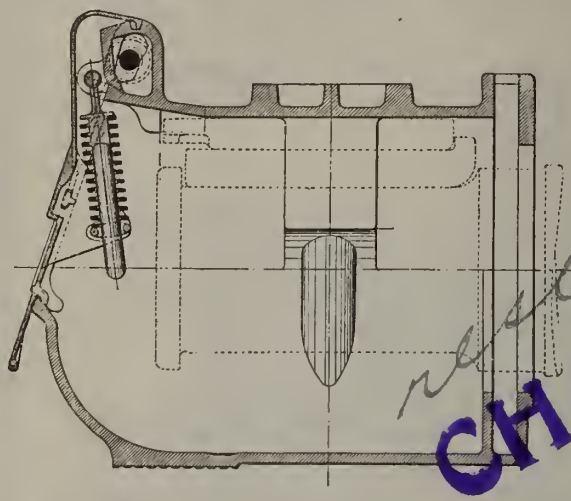

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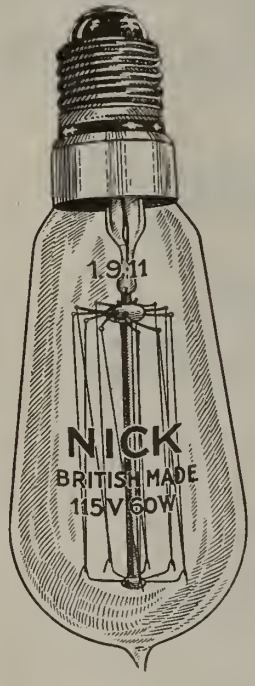

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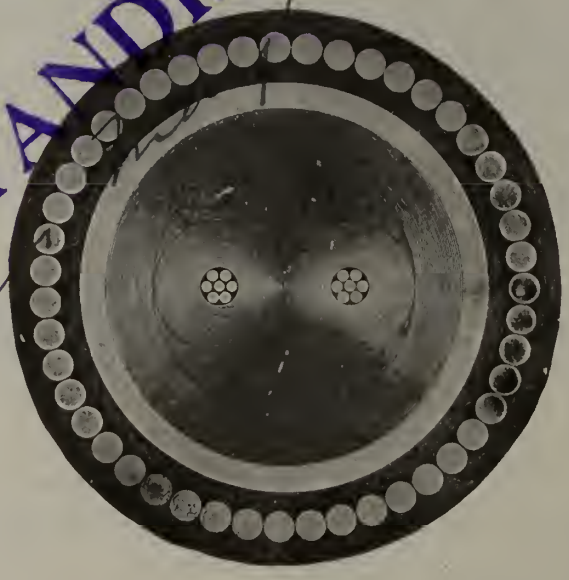

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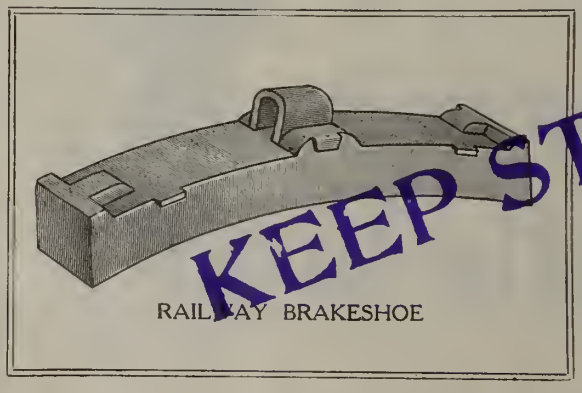

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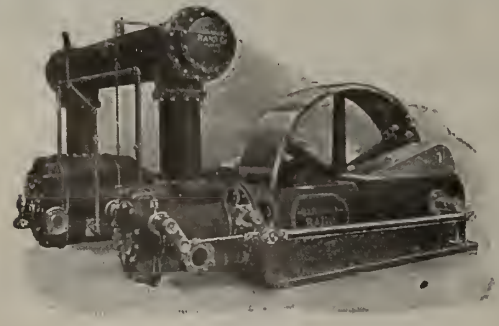

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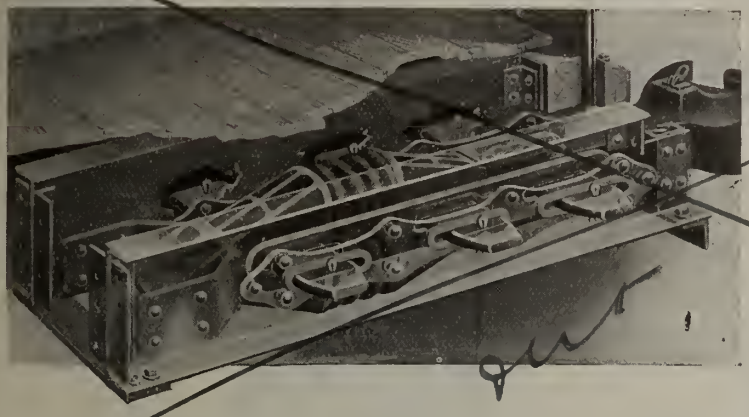

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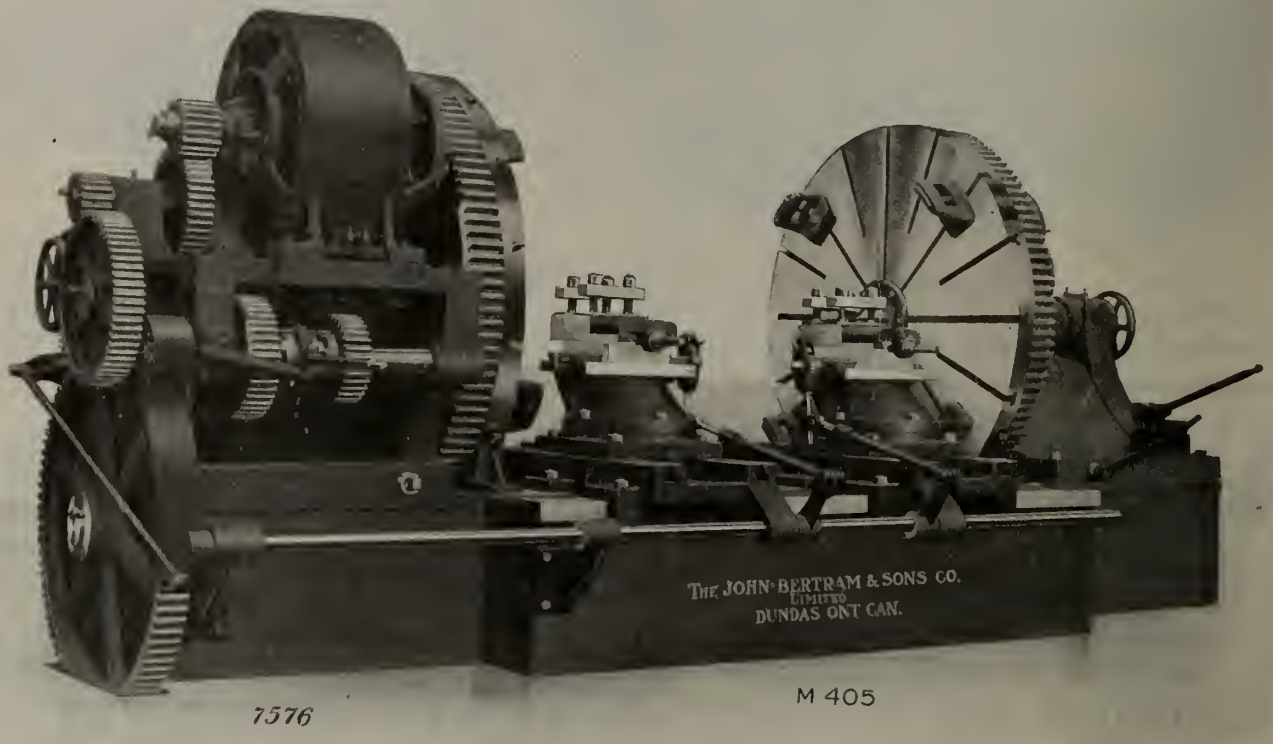

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The Railway and Marine World

April, 1912.

Grand Trunk Railway Oil Burning Motor Car.

By Frederick H. Moody, B.A.Sc.

For a great many years the G.T.R. has had a small motor car operating on the International Bridge over the Niagara River, between Bridgeburg, Ont., and Black Rock, N.Y. This car is of very small proportions, about the same as a small sized electric street car, only with steam motive power, a small coal fired boiler occupying one end. About three years ago, a larger car was built for the same service, having the same general size as that of a standard passenger car, similar in construction to the oil-burning motor car in fig. 1, which is under discussion in this article. This second car, coal-burning like its predecessor, proved such a success in this service across the bridge, that it led to the consideration of the advisability of extending the service from Black Rock to Port Colborne, Ont. The coal-burning car is now making 24 round trips a day between the two border towns, accommodating people whose business calls them back and forth to Buffalo, Black Rock being a suburb of that city.

The north shore of Lake Erie, as far west as Port Colborne, is one of Buffalo's favorite nearby and summer resorts, and the summer traffic along that portion of the Black Rock to Goderich branch of the G.T.R. Middle Division is fairly heavy. This traffic, being suburban in its nature, in order to be developed properly, required a more frequent service than would be profitable were complete train units to be operated to meet this demand. This led to a further development of the coal-burning car used so successfully to cross the bridge.

An oil-burning car was built at the company's Point St. Charles shops, Montreal, of the same general size, but with the elimination of the use of coal, which made the services of a fireman unnecessary. This motor car is shown in fig. 1, the other illustrations showing the motive power details. Following are the principal dimensions of the car:—

Length over end sills	60 ft.
Length over drawbars	71 ft.
Width of body	10 ft. 1 in.
Width of upper deck	6 ft. 2 ins.
Width over lower tail lamps	11 ft. 3 ins.
Height from rail to top of roof, over all	14 ft. 8½ ins.
Truck	One, 4-wheel, 34-in. steel tired wheels
Truck, wheel base	8 ft.
Truck journals	4½ x 8 ins.
Doors, passenger end	6 ft. 6 ins. x 2 ft. 2 ins.
Doors, motor end	6 ft. 8 ins. x 1 ft. 9 ins.
Wheel base	52 ft.

The car is divided into three compartments. The passenger compartment is 31½ ft. long, smoking, 11 ft. 7 ins., and engine room, 16 ft. All compartments are 8¾ ft. wide. The seating capacity in the passenger end is provided for by 26 double seats, and two settees, seating 6 passenger each. All these seats have medium height backs, and are upholstered in imitation leather. The accommodation in the body of the car is 42, with 16 in the smoking compartment, a total capacity of 58. Both passenger apartments are finished in mahogany, varnished and polished.

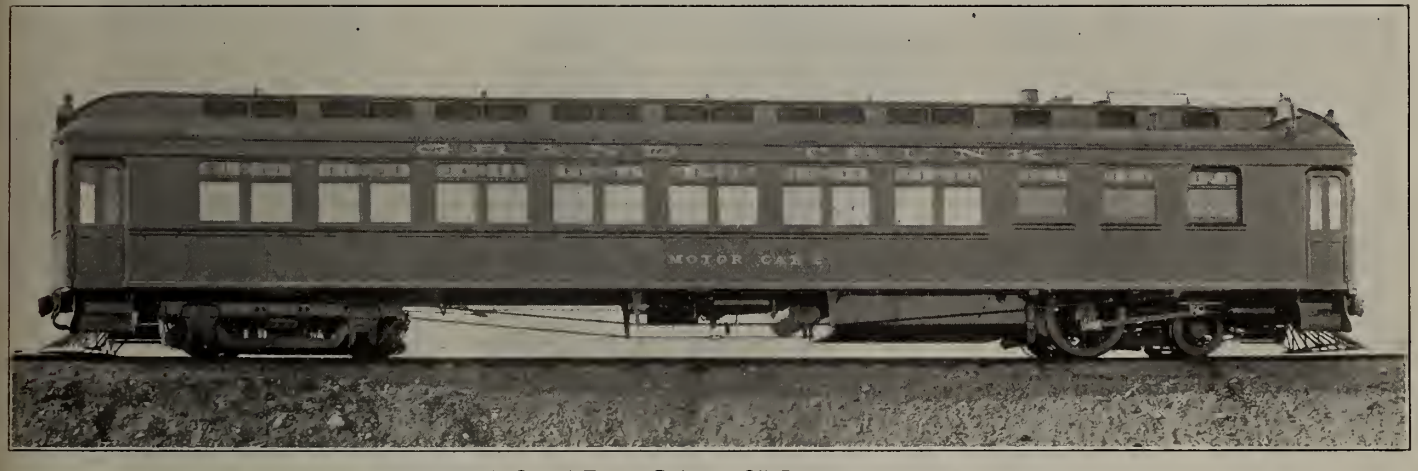


Fig. 1. Grand Trunk Railway Oil Burning Motor Car.

Four acme oil lamps furnish the car lighting; the heating is by straight steam. The windows are of the plain double type, with combination art glass tops, 17 to a side, with two on the end. The blinds are pantasote roller type, with clip fixtures. The deck sashes correspond in number to the side windows. The floor covering consists of a centre strip of linoleum.

The outside painting is of the usual G.T.R. standard dark green color with broad stripe ornamental trimmings. The roof is covered in modern canvas style.

The locomotive end and its general arrangement with regard to the car body are shown in fig. 2, the car body at that end being roughly outlined about it, as indicated. Following are the principal dimensions:—

Gauge	4 ft. 8½ ins.
Service	Suburban
Fuel	Crude oil
Tractive power	4,876 lbs.
Weight of car, motor end	64,400 lbs.
Weight of car, total	101,100 lbs.
Wheel base, engine	6 ft. 2 ins.
Cylinders	11 x 16 ins.
Valves	Slide
Driving wheels, diam.	54 ins.
Radial truck wheels, diam.	33 ins.
Driving wheel journals	7 x 8⅞ ins.
Radial truck journals	6 x 7¾ ins.
Boiler	Radially stayed
Boiler, diam.	3 ft. 6 ins.
Pressure	160 lbs.
Firebox	36 3-16 ins. long x 38¼ ins. wide
Tubes	144 1½ in., 5 ft. 6½ ins. long
Heating surface, tubes	308.4 sq. ft.
Heating surface, firebox	51.6 sq. ft.
Heating surface, total	360 sq. ft.
Grate area	9.6 sq. ft.
Water tank capacity	1,620 U.S. gals.
Oil tank capacity	313 U.S. gals.

The boiler is of the usual locomotive type, considerably shortened. It is provided with sand box and steam dome, as is customary, and the safety valve, instead of being an independent dome, is attached to the top of the steam dome, a large diameter vent leading from the latter outside the roof of the car. The sand box has four leads, one for both front and rear of each driving wheel, for the car is intended to operate in either direction equally well. The smoke stack, located immediately in front of the sand box, has an outer lagging pipe to protect the roof of the car from excessive heat. Both stack and safety valve vent project a short distance above the top of the car, as the illustration shows.

The motive power unit comprises a complete single driver locomotive, with a radial trailing truck, the frame and spring rigging, etc., being practically the same as in a locomotive of the usual construction. The car sills are attached front and rear to this frame.

A throttle lever on top of the boiler, on the engineer's side, connects with the throttle in the steam dome. The steam, on its path to the cylinders, passes along a 3-in. dry-pipe located in the boiler body over the firebox, coming out through the back head and passing down around the firedoor opening to a tee head, where it branches out each side to the cylinders attached to the outside of the frames. The exhaust from each cylinder passes into a 2½-in. looped pipe leading halfway along under the boiler, connecting there through a tee head having sweeping curves to a 3½-in. pipe leading forward between the frames and up into the smokebox. An exhaust pipe of good design provides ample draft.

The cylinders, located under the platform at the rear end of the boiler, are different from the usual locomotive type

used in America, though somewhat similar to the outside attached cylinders on the slab frame common in Great Britain. They are bolted to the outside of the frame, there being no saddle casting of which they can form a part. The valve chests, containing slide valves, are

as shown in the illustrations, figs. 1 and 2. The piping for oil, which is the principal feature of design in this car, is shown in fig. 3. A ¾-in. steam pipe leading along the top of the boiler from the steam dome leads to three reducers and ⅜-in. valves. The valve to the left

tive pipe connections being at the rear end of these chambers. The steam chamber has an adjustable opening at its front end through the two pieces of copper, the lower one of which is adjustable by means of cap screws in elongated slots. The 1-in. opening can

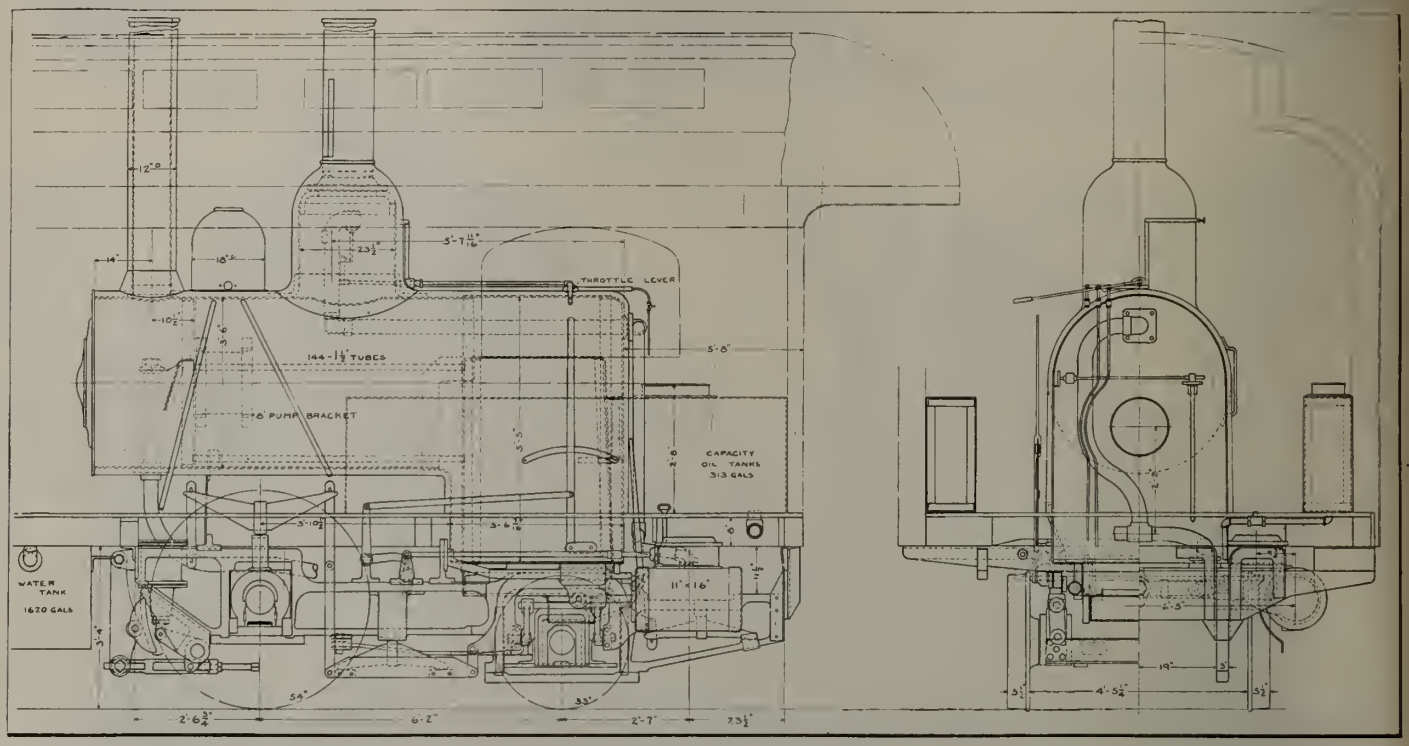


Fig. 2. Motive Power Equipment of Oil Burning Motor Car.

well set into the frames, the valve stem being directly over the wheel tread. The motion work is of the Stephenson type.

The radial truck is of simple design, suspending links allowing for a slight side movement of the truck, to allow the otherwise rigid wheel-base to negotiate curves. The locomotive end, while essentially a truck like the passenger end, is

leads to the air pump. The middle valve controls the oil heating coils in the rear oil tank of the two located on the side opposite to the engineer. This coil consists of four turns of ½-in. pipe bent to a 6-in. circle. The steam passing through this coil escapes under the car through a downward pipe from the top of the coil leading through the floor of the

be varied from a hair breadth to over ½-in., giving a wide latitude of variation to the volume of the steam jet. The oil comes into the upper chamber, and dribbling down over the front edge of the chamber, is there picked up by the steam jet, atomized by it, and sprayed into the firebox, the atomized spray of oil burning with great intensity.

The injecting steam comes from the right of the three valves in the pipe leading from the steam dome, before mentioned. The oil travels down by gravity from the tank containing the oil-heating coils. These coils prevent the oil from congealing, and cause the flow of oil to be steady. The first section of pipe leading from the oil tank is 1¼ in., and has a stop cock in it. The section next the oil injector is 1 in., and contains the engineer's control valve or feed cock, the oil control wheel for which is located near the throttle lever conveniently for the engineer. The controlling wheel and the oil valve are connected through rods with intermediate bevel gears.

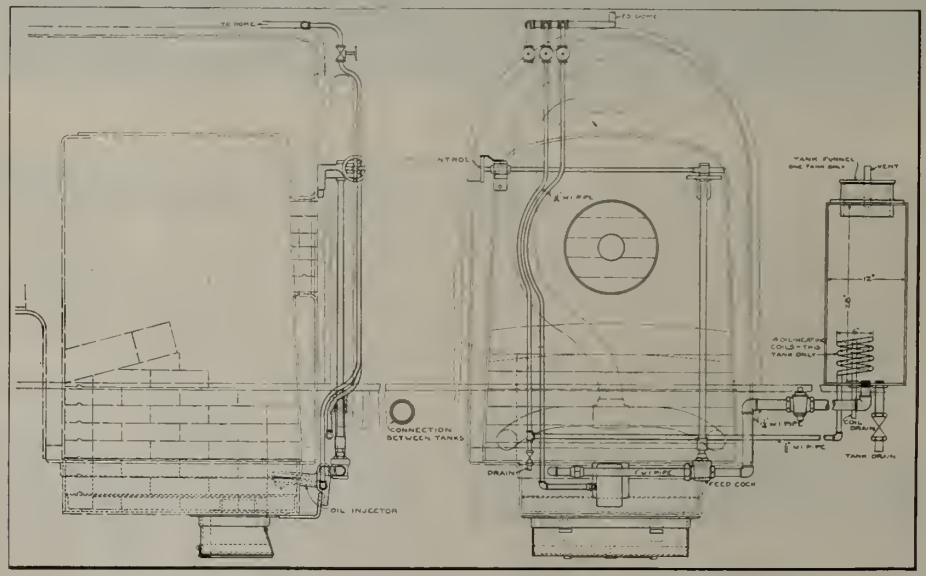


Fig. 3. Oil Piping on the Boiler, showing Location of Oil Injector.

not mounted on a bogie truck, free to adjust itself to curves; hence the radial truck is required for the leading wheels.

The spring system is so designed as to cause the major portion of the weight to fall on the drivers. The lower lever is fulcrumed on its spring off centre. The water tank is located directly forward of the drivers, under the centre of the car,

car. Another drain is provided in the pipe running to the coil itself, and is controlled by another valve in the location shown.

Oil is injected into the firebox by steam pressure, the nozzle used being shown in fig. 4. This nozzle consists of a two-chambered casting, the upper for oil and the lower for steam, the respec-

The oil injector, located directly under the mud ring at the front of the boiler, impinges the hot flames under a brick arch in the firebox. The furnace is provided with a brick lining part way up, along the sides and front, the latter bending up over to form a deflecting arch. This protects the boiler tube sheet from the intense heat of the oil flame, the heat of combustion being at the same time conserved, passing up over the arch into the tubes. The face pieces of the oil injectors are made of copper to withstand this intense heat, which might otherwise melt the face of a metal that is not as good a conductor of heat as copper.

The usual firedoor opening is bricked up, leaving only a small opening in the centre for cleaning purposes. The use of oil fuel in a boiler causes the tubes to become coated with a hard, oily carboniferous matter that if allowed

to accumulate would eventually clog up the tubes to the passage of the gases. This would reduce the conductivity of the tube in the same manner that the boiler scale reduces the boiler efficiency. This difficulty of clogged pipes has been overcome in the same way as that employed in marine practice. Through the small opening in the bricked-up door, a small shovel filled with sand is introduced. The draft is strong enough to pick up the particles of sand and draw them through the tubes, the sharp edges of the sand cutting away the caked carbon, thoroughly cleaning the insides of all the tubes. This cleaning is done about twice a day, and is being found sufficient to keep the tubes in good shape.

The combustion of oil is always regulated in oil-burning plants by the color of the gases escaping up the stack. This being difficult of accomplishment under ordinary conditions in a car of this type, without going outside the car to make observations, an ingenious provision has been made so that no difficulty will be experienced in making this inspection of the escaping gases. A small window, which may be observed beside the stack in fig. 1, in combination with a couple of mirrors conveniently located inside the engine room, makes an observation of the escaping gases at all times possible to the engineer.

This car, together with the other two cars previously mentioned, are housed in a 3-stall section to the roundhouse at Fort Erie. Each stall has a pit its full length under the cars. These pits each have air, water and oil connections. The oil is brought in through a 1½-in. hose and pipe connection under 5 lbs. of air pressure, from three 7-ft. diam. and 7-ft. high tanks located in an underground chamber 15 ft. long, 10 ft. wide and 10 ft. deep, made of concrete. This chamber has four vent holes in its roof. The tanks are piped to operate independently, so that two may be filling by gravity from tank cars alongside, while the third is being used to fill the car tank. Beside the connections in the building, there are similar attachments to an outside track.

No tests have been made to determine the ultimate velocity attainable with this car, but over 40 miles an hour can be made and held for considerable periods. The 20-mile run between Black Rock and Port Colborne was made during the last summer season in the scheduled time of one hour, which included 10 stops, or at the average speed of 20 miles an hour. The car comes up to speed more rapidly than would a full train.

As might be supposed, from a fuel standpoint, this car is more expensive to operate than its coalfiring twin, for the price of oil is high as compared to coal. The fact that a fireman can be dispensed with, makes the net cost of operation less than the other. Not only that, but the service is more popular from the fact that the car is cleaner, and many of the objectionable features of coal-burning are done away with.

The writer is indebted to the G.T.R. Motive Power Department for the details of construction and the features of operation.

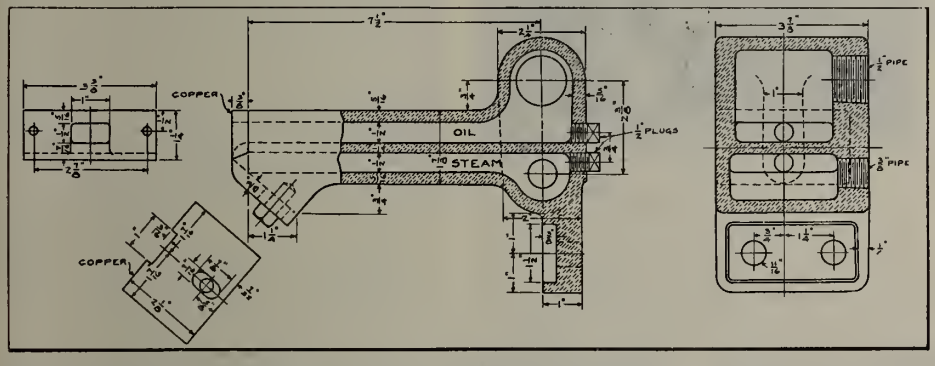


Fig. 4. Design of Nozzle for Injecting Oil into the Firebox.

Lubrication of Superheated Steam Locomotives.

At the annual meeting of the Travelling Engineers' Association in Chicago recently, the committee on "Lubrication of Locomotives using Superheated Steam," of which M. H. Haig was Chairman, presented a report containing the results of observations on 14 of the 30 roads having locomotives equipped with superheaters, which is abstracted as follows:—

The effect of superheat on lubrication, depends upon the temperature of the superheated steam. Smoke-box superheaters give the lowest degree of superheat, none of those reported exceeding 490 degrees F.; this was obtained with a drum type in service on the Santa Fe. The Baldwin superheater has a temperature of 430 degrees F. for the highest. At the temperatures obtained with smoke-box superheaters, little trouble has been experienced from the use of the same methods of lubrication employed on saturated steam locomotives, and practically no changes have been made. Oil is being delivered to the centre of the steam-chest for slide valves and inside-admission piston valves; while for outside-admission piston valves, the oil is introduced into the ends of the valve chamber. In some cases, the cylinders have been tapped to receive direct lubrication at a point in the middle of the bore, and near the top. Experience with this method leads to the belief that equally good results can be obtained by the usual methods of feeding the oil to the steam-chest.

All roads reporting have found it unnecessary to change the quality of the oil with low-degree superheat; and the increased quantity consumed is but slight. Oil with a flash point of about 520 degrees F. is the kind used. Mileage reports per pint vary widely, depending upon locomotive size; the figures range from 35 to 75.

Little data were received relative to the wear of valve and cylinder packing with a low degree of superheat although in some cases, the wear appears to be a little more rapid. No case is cited of any change of material being made, nor was the rod packing changed.

Eight railways reported the use of smoke-tube superheaters. The superheat obtained varies from 100 to 200 degrees with corresponding steam temperatures of from 490 to 580 degrees F.

Differences in boiler pressure were found to have no influence in the proper lubrication of valves and cylinders of locomotives using superheated steam. The only effect discernable, both with saturated and superheated steam, was that the quantity of oil consumed was increased. Some railways feed directly to the cylinder, while others feed in the usual manner to the steam chest. Satisfactory results are obtained by the following methods of feeding oil to the steam chest, all cases applying to piston valves, as no cases were known of superheated steam being applied with slide valves:

(a) Two feeds per steam chest, with a delivery near each admission port, preferably a little toward the centre of the steam chest;

(b) The customary one feed per steam chest, introducing the oil into the centre of the steam chamber;

(c) One feed per steam chest, introducing oil into the steam channel at a point near the steam chest; and

(d) Three feeds per steam chest, one in centre of steam chamber, and one at each end near the admission ports, each port of delivery having an individual lubrication feed.

To insure proper lubrication at all times, it is recommended by some that steam be admitted to the cylinders when drifting; it has been found that even though proper lubrication is obtained while working steam, the valves and cylinder walls become dry after drifting for some time. A drifting valve will let sufficient steam into the valve chambers and cylinder if properly handled by the engineer. These results were obtained from direct observation of two roads equipped with and without means of admitting steam while drifting. By proper care on the part of the engineer in always opening the drifting valve before closing the throttle, it is possible to obtain material increase in the life of packing rings.

The use of mechanical feed lubricators is reported on as being unsatisfactory, the hydrostatic type proving superior. The mechanical lubricators failed from mechanical defects, greater liability of failure, and higher cost of maintenance.

Several different grades of valve oil are used on locomotives equipped with high degree superheaters. Flash points of from 550 to 600 degrees F. were reported, in most cases the same oil as that provided for saturated steam locomotives. The oil as used by the Canadian Pacific Ry. has a flash point of 600 degrees F. for use with steam having a minimum temperature of 590 degrees F. The successful use of an arrangement of oil piping, whereby valve oil is passed through the smoke box before entering the steam chest, indicates that high temperature has no permanent effect upon its lubricating qualities when protected by steam. This should not be considered as proof, however, that oil possesses any lubricating qualities while subjected to excessive temperature, as the temperature in the steam chests and cylinders is comparatively low.

High superheat has increased the quantity of oil used in valves and cylinders, varying in different cases from 10 to 100%. The larger percentages are due to the delivery of oil directly to the cylinders without a reduction in the quantity fed to the steam chest. One road, however, reports that the reduction of water carried to the cylinders by foaming, which has been effected by the application of superheat, has enabled the locomotive to be operated with no increase in the oil allowance.

The wear of cylinder packing rings is increased by the use of highly superheated steam, and the direct introduction of oil into the cylinders has not overcome the trouble. On the other hand, the wear of piston-rod packing is but slightly affected. The C.P.R. reports that in the case of cylinder packing rings, the life was from 1 to 18 months

when using superheated steam, as against 12 to 24 months with saturated. Valve packing rings last from 12 to 24 months with superheated steam. In both cases, cast iron is the packing ring material.

The information received on lubrication agreed so closely that the following conclusions become certain:

1. The conditions of lubrication are practically unchanged by the degree of superheat commonly obtained from smoke box superheaters.

2. The flash point of oil should be higher than the temperature to which it will be subjected at the point where lubrication is to be effected.

3. The hydrostatic lubrication meets the requirements of proper oil delivery.

4. The life of common gray iron packing rings is too short to commend this material for use with high-degree superheat.

Pacific Type Locomotives for the Grand Trunk Pacific Railway.

The G.T.P.R. has received recently 15 Pacific type locomotives built by the Montreal Locomotive Works, one of which is illustrated herewith. The design embodies a number of features which, while they have been successfully applied to a number of locomotives built within the past two years for railways in the United States, have not heretofore been extensively used on Canadian locomotives. It therefore possesses more than the usual interest.

Among these new features will be noticed the self-centering guide for the valve stem and the outside bearing radial truck. The valve stem guide, which is very clearly shown in the illustration of the general view of the locomotive, is made integral with the back head of the piston valve chamber, and so constructed as to be easily adjusted for wear. It can, therefore, be erected, taken down and replaced without any lining up, at the same time ensuring that the guide is absolutely in line with the piston valve chamber. This saves considerable time which is consumed with the valve stem guide of the ordinary construction employed with the Walschaert valve gear when it becomes necessary to take down the valve motion. In case of wear, liners are provided on the top and bottom of the guide which can be removed or inserted as may be required. It is self-supporting so that no bracing from the guides or any other source than the cylinder is required, which is another advantage. It also permits the use of a straight design of combination lever, without forks, which is connected to the valve stem cross head by a pin passing through the wings of the latter and thus affords greater lateral stability than is obtained in other designs.

The improved design of outside bearing radial truck, a detailed illustration of which is given, obviates the use of outside supplementary frames secured to the rear portion of the main frames by heavy cast steel filling pieces, which some of the other designs of this style of truck require. In this way it effects a considerable saving in weight—in the ordinary design from 2,500 to 3,000 lbs.

The floating spring yoke hinged to the

Radial Trailing Truck, G.T.P.R. Pacific Type Locomotive.

main frame, combined with the drop forged sphere which furnishes support for the spring seat, provides for a universal adjustment of the springs to the rise and fall of the engine. Double inclined friction plates between the spring seat and the top of the journal box provide a resistance to transverse motion and assists the action of the spring centering device to restore the truck to its normal central position on entering a tangent after passing through a curve. This gives the track excellent riding qualities, as experience has proven. With the construction used for supporting the spring seats, not only is flexibility provided, but all the spring seats are in compression. Thus, any wear and loss motion which may accumulate is automatically taken up.

In point of weight, the locomotive here illustrated is among the heaviest of its type in service in Canada. In working order it has a total weight of 219,900 lbs., of which 143,500 lbs. are carried on the driving wheels, and the remainder on the front and trailing trucks. With cylinders 22 ins. in diameter by 28 in. stroke, 73 in. drivers and a boiler pressure of 200 lbs., the maximum theoretical tractive power is 31,600 lbs. Other general dimensions, etc., are given in the following table:—

Gauge	4 ft. 8½ ins.
Weight on drivers	143,500 lbs.
Weight on truck	43,000 lbs.
Weight on trailers	33,400 lbs.
Weight, total of engine	219,900 lbs.
Weight of tender	143,000 lbs.
Wheel base, driving	13 ft. 4 ins.
Wheel base, total of engine	33 ft. 3½ ins.
Wheel base, total of engine and tender	62 ft. 3½ ins.
Cylinders, diameter and stroke	22 by 28 ins.
Type of gear	Walschaert
Diameter of piston valve	14 ins.
Maximum valve travel	6 ins.
Outside lap	1 1-16 ins.
Inside clearance	3-16 ins.
Lead in full gear	1-16 in. forward, 7-16 in. back
Driving wheels, diameter outside	73 ins.
Trailing wheels, diameter outside	49 ins.
Driving journals, diameter and length	9½ x 12 ins.
Trailing journals, diameter and length	8 x 14 ins.
Engine truck wheels, diameter	31 ins.
Engine truck journals	6½ x 10½ ins.
Boiler type	Straight top, radial stay
Boiler, outside diameter at first ring	70½ ins.
Boiler, outside diameter largest course	73 ins.
Working pressure	200 lbs.
Firebox, length	96⅞ ins.
Firebox, width	75¼ ins.
Firebox, water space, front	5½ ins.
Firebox, water space, back and sides	4½ ins.
Tubes, material	Kerva seamless steel
Tubes, no. of	303
Tubes, spacing	2¾ ins.
Tubes, diameter	2 ins.
Tubes, length	20 ft. 6 ins.
Heating surface, tubes	3,239 sq. ft.
Heating surface, firebox	169 sq. ft.
Heating surface, total	3,408 sq. ft.
Grate surface	50.59 sq. ft.
Tender, water capacity	8,000 gals.
Tender, coal capacity	10 tons
Tank, kind	Waterbottom
Length over all, engine and tender	72 ft. 9 ins.
Extreme width	10 ft. 6½ ins.
Extreme height	15 ft. 2¾ ins.
Brakes	Westinghouse-American on drivers, engine truck trailers and for train
Frames	Cast steel single, front rails integral with main frame
Fire door	Franklin pneumatic

These locomotives have been placed in passenger service between Winnipeg and Edmonton, and we are advised that they are giving every satisfaction.

The Eastern Terminal Realty Co. has been incorporated under the New Brunswick Companies Act to promote immigration and settlement in the province, to deal in lands, to promote the establishment of industries, and in connection therewith to build or promote the building of docks, wharves, railways and tunnels, and to own and operate steam and other vessels. The capital is fixed at $150,000; the company's offices are in St. John, and the provisional directors are:—A. E. Massie, H. F. Puddington, D. F. Pidgeon, W. H. Harrison, St. John; T. Bell, Rothesay, N.B.

The G.T.R. is opening an uptown ticket office in Stratford, Ont., with Deacon and Trow as agents.

Grand Trunk Pacific Railway Pacific Type Locomotive.

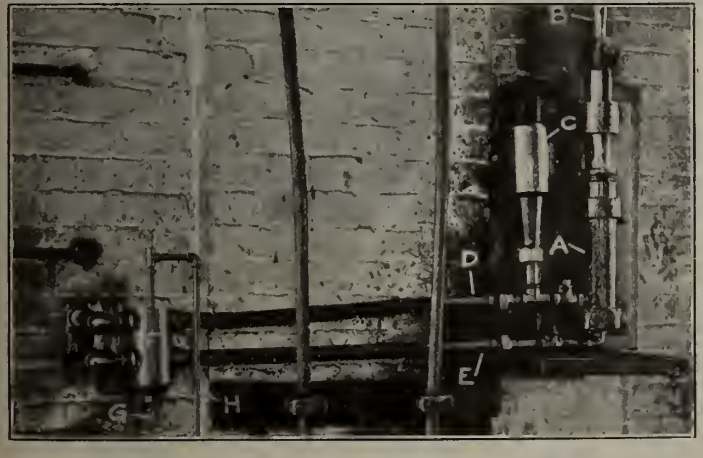
Railway Mechanical Methods and Devices.

Maintaining Fuel Oil Pressure at the Pere Marquette Rd. Shops.

The Pere Marquette Rd. shops at St. Thomas, Ont., have a very simple little pump arrangement for maintaining a pressure on the fuel oil. which is used quite extensively throughout the shops for heating purposes. Its use has been found much more satisfactory where a constant pressure is maintained, keeping the flame from fluctuating to too great an extent, thereby making it possible for the workman to obtain more uniform results.

The arrangement is bolted to the wall, about 8 ft. above the floor, and consists essentially of a pump cylinder A, in which a plunger operates, actuated by a long connecting rod, the lower end of which is shown at B. This connecting rod, of about 10 ft. length, connects to an eccentric on the main line shaft, thereby being given a short throw, sufficient to give a plunger displacement of about 3 ins. The pump is composed solely of a piece of piping capped at its lower end, with a packed joint for the plunger at the upper end; the plunger is guided still further by a bracket just above the pump. The pump valves are simple, consisting of two check valves, arranged in opposite directions for the delivery and intake pipes.

The air chambers C in the delivery pipe D maintains a steady flow; this chamber is connected in a simple manner by a tee. The intake pipe is the lower one, E. The chamber F, into which both delivery and intake pipes enter, is the by-pass for short circuiting the oil back to the pump when the desired pressure is exceeded. This desired pressure may be regulated at will through the screw G, which regulates the compression of the spring on the balanced valve in F. When the oil pressure exceeds the set amount, the valve in F opens, allowing the oil to flow around from D through F to E, and again into the pump.



Wall Pump for Maintaining Fuel Oil Pressure.

The pressure maintained may at all times be seen by connecting a gauge to the tube H, which is done at a point nearer the floor, where it may be easily read. The arrangement gives no trouble, lubricating itself and keeping in condition at all times. Being direct-connected to the line-shaft through the eccentric, insures a maintenance of the pressure as long as the shop is in operation. No means are provided for throwing the mechanism out of gear, and experience seems to show that no such means are required.

Boiler Tube Beading Tool Gauge at the M.C.R. St. Thomas Shops.

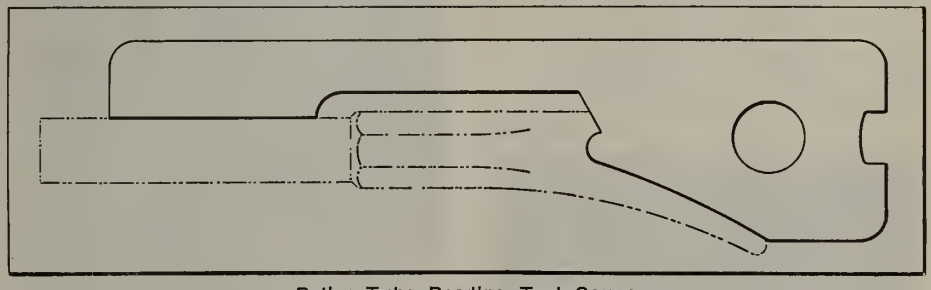
The New York Central Lines, in common with most other steam roads, have experienced considerable annoyance in the past with leaky flues. This is a difficulty that seemingly cannot be overcome, it being necessary to caulk the joints with a beading tool quite frequently—on some heavy runs as often as once a trip, although this is a rare instance.

As customarily made, both the blacksmith and toolmaker use their own judgments in the respective operations of forming and finishing the beading tool previous to tempering. The consequence is that at different points on the same railway system, different ideas prevail with regard to the depth of the bead.

The locomotive as originally built at the shops has a certain bead given to the tube ends. The first time it is in the repair shop, the chances are that a beading tool giving a slightly different bead will be used—possibly one flattening down the bead. If the locomotive goes to another shop for the next tube tightening, a tool with a deeper bead may be used. The consequence of this last will be to form a groove in the tube sheet around the flue, resulting from the tool protruding, due to the greater depth of the tool bead. A few repetitions of this sequence of differently formed tools soon ruins the tube ends, necessitating safe-ending.

The New York Central Lines have overcome this difficulty by having the beading tools over the whole system made to a standard gauge of the type shown in the accompanying illustration. These gauges are made of ⅛-in. steel plate, different gauges being used for the various tubes to be beaded. The toolmaker and blacksmith thus have a definite form to follow, leading to a uniformity of bead, and what is more important, increased life for the tubes.

This is not an entirely new practice on steam roads, as a number now employ such a system of standard tools, but the majority of lines have yet to be shown the advantage of employing some such systems.



Boiler Tube Beading Tool Gauge.

Piston Packing Rings at the Intercolonial Railway Shops.

Nearly every railway has its own design of piston packing rings, and it may truly be said that their number is legion. Each one has generally been developed with a view to meeting best the requirements of the particular line with which the design is connected.

The Intercolonial Ry. has a three-piece design, such as is shown in the foreground in the accompanying illustration. These three pieces, when assembled from the hollow frustum of a cone. the inside diameter being that of the piston rod to be packed. The smaller end of this composite frustum is beveled off, the whole construction being as shown in the illustration. These several parts of the cone frustum construction are radially slitted to allow for inward spring for the cone surface, to compensate for internal wear from the piston rod.

Moulds for Piston Packing Rings.

The method of manufacture is interesting, a set of moulds being employed for the purpose. the whole being as shown in the illustration. The mould for each of the rings is shown with its respective ring leaning against it. The mould is entirely contained in a circular block of steel. A swinging cover fits over top, two holes in the top registering with the annular channel in the mould; these holes are for pouring and vent purposes, the cover being held

tightly down on the mould during that operation.

In practice, they are made in sets of three, the first one being sufficiently set to be removed by the time the third one is poured, and so on, making the process of manufacture continuous through the employment of the three moulds. In removing from the mould, a side blow with a hammer on the cover handle, swings the latter to one side, the spine remaining in the pouring holes being sheared off by the hole, leaving a clean surface.

Piles of the completed sets of packing rings are to be seen in the right background of the illustration.

The Steam Hammer as a Drop Forge.

The use of the steam hammer as a drop forge is rather unusual practice, but it is being thus employed in the Montreal Locomotive Works blacksmith shop, J. G. Boyer, foreman.

A light, enclosed frame hammer, as shown in fig. 1, is employed, the operation of the machine being identically the same as in drop-hammer forging.

The die-blocks, as will be noted in fig. 2, are precisely the same as drop-

Fig. 1. Steam Hammer used as a Drop Forge.

hammer die-blocks, with the usual breakdown, finishing and cutting off dies. An example of the work possible in this machine is shown in this illustration. Equally good work is possible by this machine as could be obtained from standard drop-forging machines.

Indirect Lighting of Railway Cars has been successfully accomplished by the Atcheson, Topeka and Santa Fe Ry. on several new dining cars recently placed in service. The lighting fixture, suspended from bronze chains, consists of a heavy leaded bowl of sufficient density to give a soft color and display to advantage the design, without transmitting any useful light. The illumination comes from the light in the bowl being deflected downward from the dull ivory-white ceiling, which makes a good reflector. The side walls of the car are finished in mahogany, and the floors, with green carpet. The light distribution determined from illuminometer tests, is remarkably uniform.

Drill for Boring between Car Sills at Michigan Central Rd. Shops

For boring holes in the centre sills of freight cars, the ordinary brace and bit proves of little value owing to the cramped position and the little free space for the brace to operate. Neil Marple, General Foreman, M.C.R. car shops, St. Thomas, Ont., has introduced a drill for getting into these awkward corners which has none of the defects of the ordinary brace and bit, but which is at the same time quite simple in construction, as the accompanying illustration shows.

The drill consists of a base on which the operator rests his foot while drilling to hold in the one location; to which an upright is hinged as indicated. This

Drill for Boring between Car Sills.

base and upright are both made of wood. Secured to the top of the upright is a chuck, held in two bearings, and into which the bit is secured by a set screw. The bit is driven by the chain and sprocket, the driving handle being located some distance down the upright in order to clear the sills being drilled. The whole construction is clearly shown by the illustration. Not only has this device proved of value for drilling between sills, but there are many other cramped locations around a car where its merits have been demonstrated, as an examination will show that the space required is only slightly greater than the length of the bit itself. The car builders find it an invaluable aid.

Canadian Northern Railway Earnings, Expenses, Etc.

Gross earnings, working expenses, net profits, increases or decreases, compared with those for 1910-11, from July 1, 1911:—

	Earnings.	Expenses.	Net Earnings.	Net Increase
July	$1,475,900	$1,114,300	$361,600	$13,400
Aug.	1,420,600	1,105,900	314,700	51,700
Sept.	1,576,400	1,157,000	419,400	38,200
Oct	2,028,900	1,348,500	680,400	99,900
Nov.	2,001,500	1,336,300	665,200	106.300
Dec.	1,831,400	1,327,600	503,800	144,600
Jan.	1,223,100	1,004,400	223,706	122,000
	$11,562,800	$8,394,000	$3,168,800	$576,100
Inc.	$ 2,693,600	$2,117,500	$ 576,100	.....

Approximate earnings for February, $1,263,400, against $803,100 for February, 1911.

Canadian Pacific Railway Earnings, Expenses, Etc.

Gross earnings, working expenses, net profits, increases or decreases, compared with those for 1910-11, from July 1, 1911:

	Earnings.	Expenses.	Net Profits.	Net Increases.
July	$ 9,661,818.14	$5,958,789.81	$3,703,028.33	$218,408.74
Aug.	10,421,904.42	6,346,333.41	4,075,571.01	383,898.68
Sept.	10,049,084.97	6,131,638.17	3,917,446.80	5,847.16
Oct.	11,207,991.99	6,526,887.24	4,631,104.75	175,944.23
Nov.	10,570,694.80	6,583,328.31	3,987,366.46	250,244.23
Dec.	10,654,871.67	6,549,141.41	4,105,730.26	819,196.37
Jan.	7,328,781.81	6,245,924.11	1,082,857.70	426,739.83
	$69,895,147.80	$44,342,042.46	$25,553,105.34	$2,280,279.24
Inc.	$3,367,288.82	$ 6,087,009.58	$ 2,280,279.24	....

Approximate earnings for February, $8,743,000, against $6,180,000 for February, 1911.

Grand Trunk Railway Earnings.

Following are the earnings of the C.T.R., C.A.R., G.T. Western Ry. and D.G.H. and M.R. for Jan., as compared with those for Jan., 1911:—

GRAND TRUNK RAILWAY.

	1912.	1911.
Earnings	$2,579,800	$2,499,012
Expenses	2,276,600	2,109,240
Net earnings	$ 303,200	$ 389,772

Fig. 2. Drop Forge Work on the Steam Hammer.

CANADA ATLANTIC RAILWAY.

	1912.	1911.
Earnings	$ 160,800	$ 167,184
Expenses	160,600	129,762
Net earnings	$ 200	$ 37,422

GRAND TRUNK WESTERN RY.

	1912.	1911.
Earnings	$ 519,100	$ 550,152
Expenses	477,900	473,850
Net earnings	$ 41,200	$ 76,302

DETROIT, GRAND HAVEN AND MILWAUKEE RY.

	1912.	1911.
Earnings	$ 162,600	$ 168,885
Expenses	190,600	162,324
Net earnings	$ 28,000	$ 6,561

*Deficit.

Approximate earnings for Feb., $3,259,943, against $3,103,166 for Feb., 1911.

TRAFFIC RECEIPTS OF THE SYSTEM.

Aggregate from Jan. 1 to Feb. 29:—

	1912	1911	Increase	Decrease
G.T.R.	$5,089,647	$4,832,725	$256,922	.....
C.A.R.	290,817	280,431	19,378	.....
G.T.W.R.	985,813	1,049,193	.....	$53,380
D.G.H. & M.R.	310,531	326,490	.....	15,959
Totals	$6,686,808	$6,488,847	$177,961	.....

Screw Reverse Gear for C.P.R. Locomotives.

Three of the large Pacific type passenger locomotives recently built at the C.P.R. Angus shops, Montreal, have been equipped with a screw reverse gear, the arrangement and details of which are shown in the accompanying illustrations.

Screw reverse gear practice has been more or less common on European roads for a number of years, but it was only during the last year that the first installation was made to a locomotive on this continent, a powerful mountain type passenger locomotive built by the American Locomotive Co. for the Chesapeake and Ohio Ry. being so equipped. The most noted instance of the screw reverse mechanism is on the large experimental Pacific type locomotive no. 50,000, recently built by the American Locomotive Co. for experimental purposes to determine the minimum weight per horsepower, and described in this issue. The C.P.R., always to the front in motive power improvements, has equipped the three locomotives already mentioned, and in addition, has a further series of 15 on which the gear is to be installed.

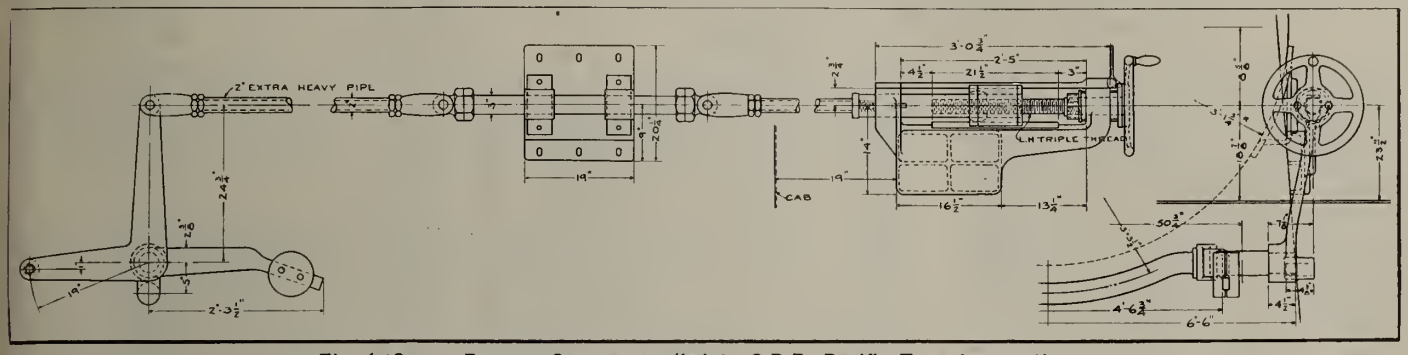


Fig. 1. Screw Reverse Gear as applied to C.P.R. Pacific Type Locomotives.

The general arrangement of the screw reverse gear and connections is shown in fig. 1. The usual bell-crank, counterweighted with an adjustable disc to balance the dead weight of radius rod and other parts indirectly suspended from the bell-crank, is connected by lengths of 2-in. extra heavy pipe to the screw reverse mechanism. These pipe lengths have an intervening section of 3-in. rod, to which they are connected by knuckles. The bearings are bolted to a stand attached to the side of the boiler, as indicated. These sections of pipe, with guiding rod, replace the customary reach rod.

The screw reverse mechanism is mounted in a casting attached to the side of the firebox at such a height that the operating wheel is in line with the cab window sill, in a convenient location for the engineer to operate. The more important details of the mechanism are illustrated in fig. 2.

The second pipe length is screw connected to a ball-connecting link, and a positive location obtained by a no. 8 taper pin through both members. This ball connecting link is of cast steel, turned to a true sphere on the ball end, with the balance ground smooth. This spherical end fits a built-up cast-iron crosshead which is guided in the mechanism by upper and lower guides fitting the two end pieces of the cross-head. The right-hand end piece forms half of the ball seat for the spherical end of the ball connecting link, while the other end piece retains in position a squared bronze nut, which cannot revolve. The nut has a 2⅜-in. triple, 1⅛-in. pitch square thread.

A square-threaded operating screw, on the end of which is bolted a 10-in. hand wheel, fits the crosshead, providing the means of moving the latter forward and backward. The operating screw is carried at the wheel end by a bearing in the holding casting. To lessen the turning friction due to end thrust when putting engine in or out of gear, ball-bearing thrust plates are provided, one on each side of the thrust bearing; the construction of these is shown in the illustration. A retaining collar screwed on the operating screw, and located by a no. 8 taper pin fitted after assembling. carries the backward thrust when shoving the crosshead forward.

The flange of the operating screw to which the hand wheel is attached, has 10 notches around its periphery, into which a latch, pin-connected to the end of the upper guide, fits. A stop, pressed forward in the drilled hole in the end of the upper guide into notches in the latch, holds the latter out of engagement when changing the gear location. Ten positions of latching per revolution are thus provided, and, as the pitch is 1⅛ in., an adjustment of less than ⅛ in. is made possible.

The screw reverse gear has several inherent points of superiority over the

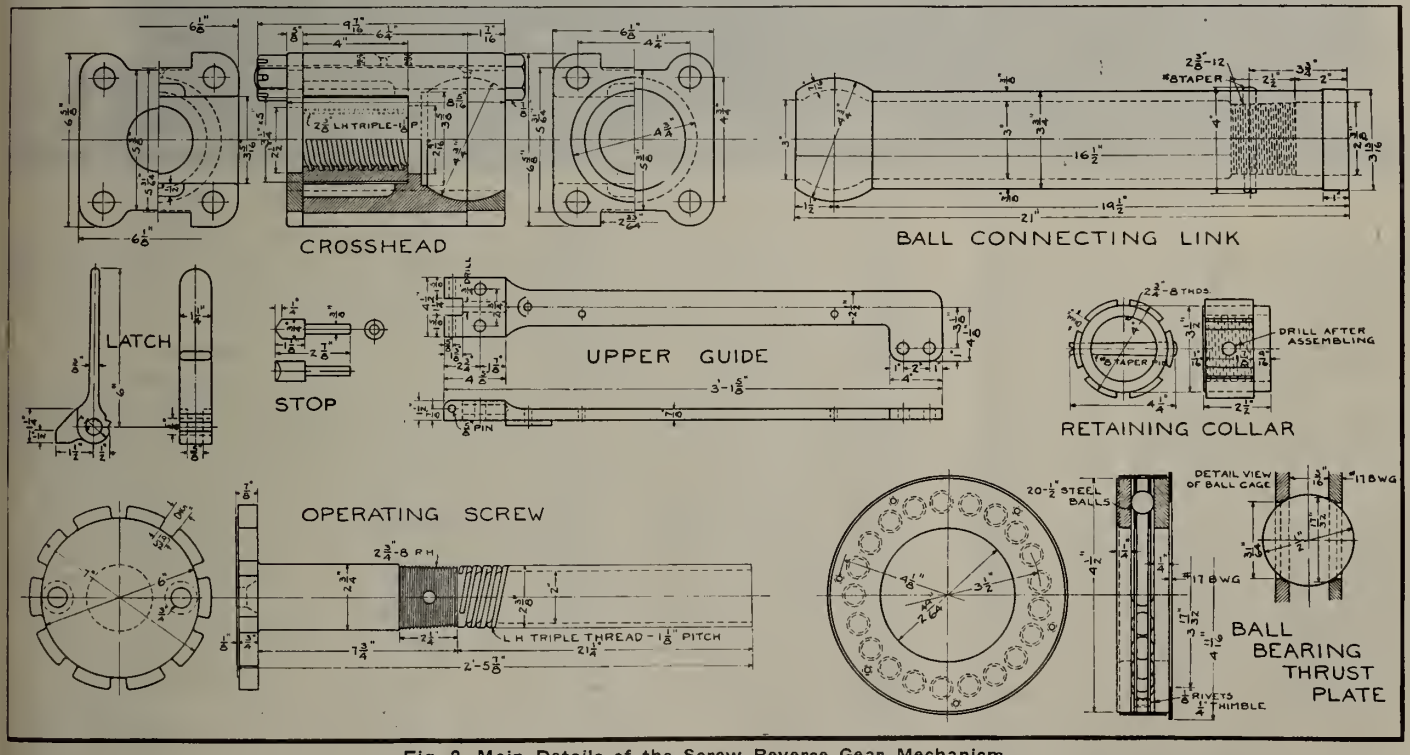


Fig. 2. Main Details of the Screw Reverse Gear Mechanism.

old reverse lever, two of which stand out most prominently. In the first place, a very fine adjustment is made possible, which for high-speed passenger work is most desirable. Secondly, at very high speeds, under the lever system, adjusting the valve travel becomes a more or less risky undertaking, due to the possibility of the reverse lever flying out of the hands of the engineer. The ordinary reverse lever is becoming quite inadequate to handle the gear of such locomotives as are being built at the present day.

The C.P.R. Mechanical Department is considering the possibility of installing this screw reverse gear on the large Mallet locomotives described in The Railway and Marine World for March. Some difficulty has been experienced, due to the freezing of the power reverse gear of these locomotives, leading to the consideration of installing the screw reverse mechanism.

Experimental Pacific Type Locomotive.

To fittingly mark the construction of its 50,000th locomotive, and at the same time to determine the limit to which the efficiency and capacity of a passenger locomotive of standard general arrangement could be carried without exceeding conservative axle loads, the American Locomotive Co. has recently built, at its own expense, an experimental Pacific type locomotive, embodying many improvements both in design and materials of construction. Being unhampered by the necessity of working to standard railway specifications, a free scope was offered towards using those designs in locomotive engineering practice that to the designers appeared best. So well have the refinements been worked out, that in actual service, this 269,000-lb. locomotive has been able to develop 2,216 horsepower, i.e., one h.p. for every 121.4 lbs. of weight. This is said to be 25% more efficient than the ordinary Pacific type locomotive. The maximum tractive power is 38,400 lbs.

Experimental Pacific Type Locomotive Capable of Developing One Horsepower per 121.4 lbs. of Weight.

It embodies the latest knowledge of general proportions, the most recent developments in materials and improvements in the design of details, combined with best use of approved fuel-saving devices to secure the utmost possible economy of the locomotive as a whole from the operating standpoint. Many improvements over long accepted conventional practice in the design and construction of some of the principal details introduced in this locomotive have since been adopted as standard practice by the builders and widely applied to a large number of other locomotives with a marked degree of success.

To obtain maximum sustained capacity, the boiler must be of generous proportions, and well designed. In order to increase the boiler size without unduly increasing the total locomotive weight, a process of weight elimination in all parts of the locomotive was resorted to. The boiler, of a conical construction, received the most attention. The difference in diameters between the front and rear courses provides a large steam space, decreasing the tendency for wet steam to be carried over into the superheater. The dome course is 87 ins. in diameter, and the front course, 75 ins. The firebox, 114 by 75¼ ins., has a grate area of 59.75 sq. ft., and is fed through two 15-in. doors. In the forward end of the firebox there is a brick arch, increasing the capacity another 10%. The equivalent evaporating surface is quite large, amounting to 5,394 sq. ft., due largely to the proportions of the Schmidt superheater, the largest of its kind ever installed in a locomotive in America, consisting of a front header with 36 superheater units leading therefrom. Under test, the average superheat was 276°, reaching a maximum of 341°. The large size of the superheater accounted for an economy of 13% over a locomotive of similar size but smaller superheater capacity. The boiler has 207 2½-in. tubes, 22 ft. long. The boiler pressure is 185 lbs.

The cylinders are vanadium steel castings, with thin vanadium cast iron bushings, this construction eliminating a weight of no less than 4,000 lbs. in this detail of the locomotive alone. This, together with outside pipe connections from the superheater, results in a decided simplification and betterment of the castings. Vanadium steel is used elsewhere in the locomotive, these parts including driving-wheel centres, frames, rods, crankpins, piston rods, valve motion parts and springs. These parts are of standard design, but much lighter.

A self-centering valve stem guide, of a type recently designed and installed on locomotives latterly constructed by this company, is used. This guide is cast integral with the back head of the piston valve chamber, and in consequence, requires no lining up, and is always correctly set. An extended piston rod guide of the self-centering type, is also embodied. This consists of a cast-iron shoe fitted to a cast-steel body on the extended end of the piston rod, and to which it is securely attached. The shoe slides in a guide bolted to the cylinder head, corresponding circular faces correctly aligning it in place. The top of the guide casting is open, so that the shoe may be readily removed when on either centre without bumper interference. The bearing surface is circular.

This locomotive is one of the first in America to apply the screw reverse mechanism, the design of which is very similar to the C.P.R. one outlined elsewhere in this issue. The locomotive being so large makes the application of the gear both a safeguard, and a further means of cut-off refinement leading to increased economy.

An improved form of radial bearing truck has been used, resulting in a weight elimination of nearly 5,000 lbs. This truck provides for a universal adjustment of the springs to the rise and fall of the locomotive, and a resistance to traverse motion through the combined action of the spring centering device and the inclined friction plates, which operate to restore the truck to its normal central position on entering a tangent after passing a curve.

A very important feature of weight reduction and improved design lies in the use of a pressed steel bumper and pilot. Between the two, over 1,500 lbs. dead weight is removed, as well as introducing a decided advance on cast-steel bumpers.

This new locomotive marks an epoch in design, being, it is claimed, the most perfect from the economy and capacity standpoint within the limitations of conservative wheel loads yet produced. It emphasizes most emphatically how present day standard locomotive practice may be improved by better proportioning of boiler and engine capacity, greater refinement in the design of details, and modification of present day standards, and the best use of fuel saving devices. It undoubtedly makes a long stride towards obtaining maximum power per unit of weight, eclipsing all previous performances.

Demands for Increased Wages by the locomotive engineers of the U.S. railways east of Chicago and north of Virginia are to be considered by a committee of 12 vice presidents and general managers. The schedule of pay demanded by the engine runners is as follows: In passenger service, for engines with cylinders of 20 ins. or less diameter, $4.20 per 100 miles or less; engines with larger diameter cylinders, $4.60 per 100 miles; overtime to be paid for at 70c. an hour on the basis of 20 miles run per hour; electric locomotives to be run at the same rate as steam locomotives; freight service, minimum rate, $5.25 per 100 miles for engines with 20-in. cylinders or less; $5.50 for engines with cylinders of 20 to 24 ins., $5.55 for larger cylinders; Mallet locomotives, $7. One hundred miles or less, or 10 hours or less, is to constitute a day's work. Overtime is to be paid for on the minute basis at an average speed of 10 miles an hour. Switching engines and yard service, $4.50 per day of 10 hours; belt-line locomotives, $5 per day of 10 hours.

H. G. Barber, Assistant Engineer, C.P.R. Construction Department, Calgary, Alta., in remitting his renewal subscription, writes:—"The Railway and Marine World becomes more necessary to railway men all the time."

Steam Railway Statistics for Year Ended June 30, 1911.

The table given in our last issue showed the financial results of the operations of steam railways for the year ended June 30, 1911. The following table gives the percentages and the principal statistical information compiled by the companes. The table published last issue and the one given below contain all the information given prior to 1910 in our compilation of these statistics, but the columns have been rearranged so as to combine in the first table the financial and in the second the statistical information.

Name of Railway	Proportion of total Passenger service train revenue to total earnings	Proportion of freight revenue plus switching revenue, &c., to total earnings	Revenue Train Mileage	Mileage of Non Revenue Trains	Earnings per Train Mile	Passengers Carried	Passengers Carried One Mile	Passenger Earnings per Train Mile	Tons of Freight Carried	Tons of Freight Carried One Mile	Freight Earnings per Train Mile
Alberta Ry. & Irrigation Co.	29.63	62.10	142,583	5,343	$ 2.42	79,446	3,225,998	$ 1.08	165,088	8,555,606	c. 2.50
Algoma Central & Hudson Bay	16.16	57.31	57,972	5,449	9.98	21,466	761,465	2.12	395,635	10,633,079	1.99
Algoma Eastern	1.99	96.52	20,212	....	4.87	5,256	49.276	.09	465,744	4,718,429	1.88
Atlantic, Quebec and Western	38.02	61.87	30,231	1,255	.80	15,767	349,382	.33	13,115	401,851	3.76
Bay of Quinte	20.42	76.62	173,290	.....	1.24	97,435	1,491,055	.26	299,718	7,791,000	2.12
Bedlington and Nelson	12.01	87.93	1,884	107	1.09	622	4,229	.13	2,238	16,008	11.38
Bessemer and Barrys Bay	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Brandon, Sask. & Hudson Bay	42.64	56.91	63,581	6,559	1.02	26,800	857,465	.65	42,851	2,064,541	1.80
British Yukon	19.84	78 43	61,624	8,957	5.21	8,809	645.806	1.08	28,940	2,425,323	10.39
Brockville, Westport & N. W.	51.43	48.50	57.595	195	1.17	66,099	1,982,976	.61	25,815	774,450	4.22
Brucc Mines and Algoma	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Canada Southern	30.83	68.87	3,832,915	104,931	2.39	1,164,571	93,881,546	1.46	6,892,022	1,094,623,993	.57
Canadian Government Railways											
Intercolonial	33.54	64.65	7,090,578	.242,540	1.41	3,286,942	166,122,542	1.10	4,254,803	1,112,203,132	.57
Prince Edward Island	54.66	42.16	.329,197	12,039	1.04	361,458	8,114,430	.57	109,345	3,846,066	3.75
Canadian Northern	19.65	73.07	6,788,269	548,668	2.41	1,394,361	113,506,430	1.16	4,675,405	1,385,711,579	.84
Canadian Northern Ontario	30.59	67.90	486,210	32,400	1.15	169,388	7,389,130	.49	506,124	39,245,162	.95
Canadan Northern Quebec	30.17	68.79	641,403	15,281	1.68	483,878	15,580,374	.77	791,199	59,247,769	1.25
Canadan Pacific	30.85	66.36	40,822,186	2,140,287	2.39	11,928,943	1,440,649,164	1.63	22,536,214	7,859,966,837	.81
Cape Breton	58.97	40.07	19,654	.....	.44	7,523	169,289	.26	5,679	90,917	3.86
Caraquet	35.89	64.10	43,832	.....	1.25	16,864	659,477	.45	27,404	1,233,180	2.86
Carillon and Grenville	53.08	2.80	2,834	.....	1.00	4,329	53 127	.53	52	676	11.78
Central Ontario,	29.48	66.83	205,152	8,033	1.53	148,848	3,665,571	.57	263,977	8,388 723	2.50
Crows Nest Southern	17.20	82.13	105,380	7,537	1.31	21,147	545,257	.53	177,558	8,649,590	1.32
Cumberland Ry. & Coal Co	30.44	69,52	42,372	.....	1.30	33,697	442,557	.43	122,361	1,386,896	2.76
Dominion Atlantic	53.16	46.27	537,009	5,012	1.37	401,028	17,645,232	.77	282,415	12,708,675	2.67
Eastern British Columbia	10.16	89.71	7,476	48	5.10	6,278	66,377	.51	123,130	1,449,632	2.38
Elgin and Havelock	30.65	69.35	19,220	.....	.57	10,719	150,066	.17	15,548	209,272	3.65
Grand Trunk	34.66	64.33	17,521,716	704,986	.87	10,517,109	525,533,909	1.39	16,635,352	2,958,973,320	.70
G.T.R. (Canada Atlantic)	24.18	73.96	1,337,922	73,891	1.44	541,490	19,450,481	.64	1,554,119	177,512,282	.75
Grand Trunk Pacific	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Halifax and South Western	50.39	49.00	357,415	9,543	1.21	202,466	7,011,604	.66	236,695	11,996,660	1.74
Hereford	30.89	67.65	74,149	1,664	.83	28,481	743,473	.34	119,207	2,716,150	1.54
Internat'l Ry. of New Brunswick	.....	.....	....	.....	.....	.....	.....	.....	.....	.....	.....
Inverness Ry. & Coal Co.	12.24	87.13	112,583	1,443	1.84	39,808	922,074	.58	315,313	17,658,817	1.02
Irondale, Bancroft & Ottawa	32.85	65.43	34,251	200	.76	13,821	312,954	.25	21,664	518,453	3.19
Kaslo & Slocan	9.71	89.12	1,390	.....	4.21	733	8,979	.40	1,427	20,945	24.95
Kent Northern	45.25	54.75	17,010	540	1.10	8,500	195,500	.50	8,000	184,000	5.60
Kettle Valley	12.32	87.00	1,953	.....	1.54	623	9,503	.19	5,205	38,094	6.09
Kingston & Pembroke	31.60	71.84	132,863	.....	1.56	87,163	2,059,524	.50	127,948	5,937,651	2.16
Klondike Mines	15.44	82.01	7,662	.....	6.17	1,823	43,184	1.61	18,044	153,418	25.28
London & Port Stanley	32.50	66.60	119,975	338	1.00	158,859	2,888,871	.48	483,430	7,974,037	.89
Lotbiniere & Megantic	21.08	78.53	20,014	.....	1.54	13,428	218,137	.34	47,422	530,780	4.57
Magnetawan River	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Manitoba Great Northern	12.94	86.94	38,904	340	1.30	8,576	197,416	.19	57,606	3,411,866	1.27
Maritime Coal Ry. & Power Co.	11.65	88.34	27,068	6,520	2.65	25,348	232,288	.57	215,534	2,287,177	2.77
Massawippi Valley	33.69	65.69	193,520	463	1.08	156,702	2,842,129	.72	519,632	15,006,798	.91
Moncton and Buctouche Ry.	37.01	62.35	20,718	2,558	1.26	20,474	430,460	.47	24,399	436,503	3.74
Montreal and Atlantic	20.98	76.89	579,791	12,593	1.82	317,852	8,202,609	.71	1,254,239	68,411,126	1.03
Montreal and Province	51 89	38.86	98,816	3,862	1.17	171,270	2,512,850	.83	87,023	2,195,951	2.46
Montreal & Vermont Jct	52.02	47.95	111,760	621	1.12	137,177	2,596,267	1.02	441,258	9,867,581	.60
Morrissey, Fernie & Michel	8.65	90.76	30,914	.....	3.50	138,450	844,545	.30	583,712	3,560,643	2.36
Napierville Jct	7.97	91.59	23,589	56	3.06	14,461	195,675	.33	297,957	8,285,883	.79
Nelson & Fort Sheppard	41.94	53.09	56,579	5,496	1.41	25,411	759,867	.88	28,114	1,030,651	4.11
New Brunswick Coal & Ry. Co.	19.88	61.29	69,620	.....	.95	21,287	436,813	.18	71,800	3,023,800	1.34
New Brunswick & P.E.I.	33 52	66.17	47,195	.....	.69	22,296	441,238	.38	41,148	617,220	3.51
New Westminster Southern	31.92	67.69	19,549	56	2.20	23,610	272,666	.70	43,865	547,140	5.43
North Shore	6.96	93.04	4,848	.....	.70	954	7,632	.04	7,983	63,864	5.00
Nosbonsing & Nipissing	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Nova Scotia Steel & Coal Co.	36.26	63.70	15,800	.....	.38	8,765	59,070	.13	8,917	75,911	5.10
Ottawa & New York	46.59	52.06	122,212	2,938	1.28	111,285	2,965,486	.94	158,601	6,198,584	1.31
Pere Marquette	6.55	93.05	1,299,013	6,148	1.89	294,278	6,198,979	.55	2,287,992	437,929,056	.51
Phillipsburg Ry. & Quarry Co.	.....	.....	.....	.....	.....	.....	.....	.....	13,447	13,447	.....
Pontiac and Renfrew	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Princeton Branch W.C. Ry.	28.42	71.58	11,925	424	2.31	81,205	414,145	.76	182,510	930,801	2.12
Quebec and Lake St. John	37.05	61.36	438,864	158.115	1.43	311,900	11,216,693	.87	328,099	29,077,304	1.32
Quebec Central	33.81	65.47	673,199	200,804	1.78	384,685	16,797,760	.99	780,798	57,186,125	1.37
Quebec, Montreal and Southern	41.35	58.47	258,665	1,542	1.22	198,472	4,797,077	.60	309,207	13,243,347	1.38
Quebec Oriental	44.24	55.76	88,670	3,160	.96	27,631	1,256,000	.64	25,847	1,912,965	2.50
Quebec Ry., Light and Power Co.	14.39	82.03	31,351	1,657	2.19	90,431	721,639	1.33	143,992	1,753,871	3.07
Red Mountain	24.39	72.90	13,041	118	1.13	8,942	80,011	.55	15,355	128,952	6.57
Rutland and Novan	62.82	37.18	7,169	.....	2.16	121,977	413,502	1.90	215,173	729,436	.79
Salisbury and Albert	39.14	59.27	38,276	.....	.73	13,786	310,177	.28	36,547	1,088,520	1.54
Schomberg and Aurora	46.26	53.38	22,476	.....	.51	20,345	179,036	.23	9,673	116,076	5.34

(*Continued on page 168*)

Steam Railway Statistics for Year Ended June 30, 1911—*(Continued from page 167)*

Name of Railway	Proportion of total passenger service train revenue of total earnings	Proportion of freight revenue plus switching revenue, &c., to total earnings	Revenue Train Mileage	Mileage of Non-Revenue Trains	Earnings per Train Mile	Passengers Carried	Passengers Carried One Mile	Passenger Earnings per Train Mile	Tons of Freight Carried	Tons of Freight Carried One Mile	Freight Earnings per Train Mile
Stanstead, Shefford and Chambly..	44.34	55.34	94,005	9,607	$ .95	186,110	1,215,543	$ .62	464,680	2,127,264	c. 2.32
St. Clair Tunnel	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
St. Lawrence and Adirondack.....	41.47	57.44	297,270	6,488	1.90	535,191	12,581,391	1.35	827,705	30,292,047	1.06
St. Martins.....	36.51	62.05	17,260	.....	.88	9,363	181,595	.32	12,373	187,735	5.02
Sydney and Louisburg.....	7.80	91.91	262,889	.....	1.73	86,799	1,410,960	.87	3,639,187	51,428,612	.79
Temiscouata.....	30.82	66.87	155,452	5,780	1.35	72.412	2,389,515	.45	140,335	6,329,862	2.22
Temiskaming and N. Ontario.....	41.91	53.95	696,883	57,088	2.13	479,183	23,525,015	1.66	524,984	53,742,002	1.48
Thousand Islands.....	31.81	59.76	30,608	.....	1.21	43,116	258,696	.38	34,503	207,018	10.73
Toronto, Hamilton & Buffalo...	27.69	71.31	464,113	7,548	2.60	538,030	16,829,377	1.18	1,891,025	73,751,225	1.10
Vancouver Copper Co.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Vancouver, Victoria and Eastern...	33.72	64.71	304,363	27,199	2.26	261,491	7,104,661	1.01	907,383	23,822,055	1.84
Victoria and Sidney.....	46.12	53.60	30,553	.....	1.77	81,965	1,033,734	1.10	34,535	487,540	5.93
Victoria Terminal Ry. & Ferry Co...	50,73	47.80	2,009	.....	2.38	72,688	66,146	1.62	32,958	29,981	7.63
Wabash.....	29.03	70.84	1,680,961	19,838	1.42	590,738	37,513,229	.93	1,379,813	326,301,134	.52
Wellington Colliery Co.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
York and Carleton.....	42.19	57.81	8,535	.....	.68	7,061	70,610	.28	8,422	84,220	4.01
	.....	.....	89,716,533	4,478,705	.....	37,097,718	2.605,968,924	.....	79,884,282	16,048,478.295	.....

Little Leaks on Railways.

By W. C. Hunter, ex-Manager New Brunswick Coal and Ry. Co. Ltd.

The scientific management of railways appears to be a favorite theme with college professors, editors, magazine writers, lawyers and students of political economy generally. Wasteful methods of the roads are alleged, and figures are given to show what might be saved per annum if this or that theory were adopted, until it would almost seem that an absurd inference of the public must be, that the management of our railways is entrusted to a lot of untrained incompetents. However, the attention that is being paid to this subject is, after all, but a manifestation of a spirit of conservation of energy and resources that is none too soon moving our people, in this case directed at the railways, for it seems to be the fashion to criticize the railways as the greatest offenders in any case, or on all subjects. But after all there is some excuse for even this, inasmuch as the railways bulk large in the public eye, as perhaps the greatest existing single form of energy, and coming in closer contact with and affecting the masses to a more general degree than any other form of human effort.

Manifestations of the same spirit are in some degree being directed at other great industries, such as mining, lumbering, etc., and indeed with very much more reason to warrant it; for while wasteful methods exist to an all too great a degree in many fields of endeavor, it can be truthfully stated that the railways are not by any means the greatest offenders in this respect. Much has been, and can be shown, to prove this; all railway men know what enormous efforts have been made in the last quarter of a century to obtain increased service at less percentage of cost, but after all, has everything been done that can be done, practically, to obtain still further results in economy by eliminating all waste? Immense sums of money have been spent, and are being spent along the lines of betterment of the railways physically, and in increasing the size of power and in lowering the relative cost of maintenance by better shops, machinery and methods, and almost every important road is increasing the educational facilities of the employes to the end that they will be taught to do their work intelligently and effectively, with less waste of energy, a course which cannot help but have splendid results. But after all has been said and done, there are few railways but have little leaks in every department, at almost every point, which, if they were stopped would effect a surprising aggregate saving. To name all these small wastes that are apparent to an observer, and what might be done to eliminate them, would take up a lot of space to discuss, but in these days of constantly increasing operating expense, the struggle to correspondingly increase net earnings, or even to keep them from decreasing, is such that any practicable plan to increase economy, or to stop waste, no matter how small, warrants consideration. If it has been one's good fortune to travel over many of the railway systems of the country, and to have visited storehouses, repair shops, roundhouses, station agents' offices, car inspectors' quarters, section houses, trackmen's shelters, water stations, conductors' cabooses, locomotives, etc., etc., one cannot help observing, no matter how perfect the system of handling supplies may be, or how often the regular officers may inspect all points, or, generally speaking, how well managed a road may be, there is still a constant waste of material going on in small quantities, one would think almost too small to notice; but when it is going on constantly all over a large system—a little here, a little there—the aggregate loss must be very considerable indeed. At some points of course it is worse than others, as on some railways it is worse than others, but all roads are losing more or less money from these little leaks. How to apply a remedy is a very pertinent question.

As a suggestion, let the management of any of our large railways select a man of general all-round experience, entitle him say, general inspector, reporting to the general manager, but making joint reports to the heads of any of the departments, divisions or districts concerned, and turn him loose on the system with authority to do all possible to eliminate waste in every department and at every point at which he can discover the same, at any one or succession of visits he may make, and let this be his only aim and duty. Such a man would require to have had experience in several departments, to be observant, and to be possessed of patience, tact, and common sense combined with firmness, and it would be necessary that he be supported strongly by his superior officer.

Let us see what such an officer may find in a trip of one day over, say, one division. He starts out on an early morning local passenger train; he may possibly find the trainmen do not properly announce stations, result, passengers are not ready to leave the train quickly to make room for passengers getting on the train, wasting time, which costs money to make up. He can instruct these trainmen in regard to this: he may find the trainmen do not handle the air whistle cord according to their instructions, wasting air, causing air pump to use more coal. Then he notices the car lamps are burning too long after daylight; waste of gas or oil. He gets off at a way station where there is a section house, and a water tank, and perhaps a coal chute, possibly he finds the train signal lamps still burning, or, if in afternoon, lighted too soon, more waste of oil. He may notice the agent at the station using good printed forms to scribble or figure on, or using a large train billing forms for freight shipments where the small size would do, a waste of stationery, and which waste is surprisingly general. The telegraph battery jars may show need of cleaning, so that station instruments would get full power, saving time in adjusting instruments when required. He then visits the tank; possibly the tank man is using too much fuel, or oil, on the pumping machinery, or there may be an unreported small leak in the tank, wasting water; at the section house he is likely to find scrap that should be sent to the nearest repair shop, these section tool house small scrap piles, more often than not, contain good brake gear, bolts, nuts, and pieces of scrap brass, and tools picked up on the track that have fallen from locomotives. Along the right of way are ash heaps where old ties were burned, that if raked would possibly be found to contain some good spikes, as well as many broken ones; the latter make good wrought iron scrap, and should be picked up.

About this time a freight train arrives, and the general inspector may notice the air brake rules for making water station stops are not obeyed, and damage is conseouently done to draft rigging and lading. The locomotive is at last "set" to take water, and he may notice the fireman haul the drop pipe

of the tank or stand pipe down with a bang, on to the edge of the tender manhole, causing damage to pipe, then the tender may be overflowed, waste of water, besides washing off coal or at least damaging its heating quality, or if it is in winter, ice is formed on the track, costing money to remove.

He may notice the locomotive engineer is using a leaky or broken spout oil can, or the lubricator pipe connections and packing of the sight feed glasses are leaking, causing waste of oil. If at a coaling station he may observe that the tender is overloaded, so that coal is wasted by dropping off when the locomotive is running. If he rides on the engine for a few miles he may find wasteful methods of handling fuel and rough handling of the train, and rough braking, all wasteful. When he rides in the caboose he may find worn out car journal brasses which have not been turned in, and perhaps too many new ones on hand, an over stock of spare coupler knuckles, too many spare air hose and coupling gaskets, which deteriorate fast in non-use, and quite likely there will be found a scarcity of proper tools for replacing hose or gaskets on the road, resulting in loss of time. The same remarks may, or may not, apply to all the supplies with which the caboose is supposed to be equipped.

The inspector may ride this freight train to a divisional terminal, finding opportunities to effect economy all along the road. If it is a way freight train, he may find package freight badly loaded, so that delays occur at way stations while box cars are overhauled for the "pieces" that should have been handy if "station location loading" had been followed when the car was loaded at starting point; he may find rough switching done by the crew at the way stations, damaging lading and draft gear, which may not be apparent at the time, but sooner or later has to be paid for; air hose may not be uncoupled by hand, resulting in damage to hose that will certainly have costly consequences; he may, if it is cold weather, find cars being moved from spur tracks at way stations with the brake shoes frozen to the wheels, or even if it is not cold weather the same cars being moved with the hand brakes set, resulting in slid flat wheels.

Arriving at the divisional terminal the inspector will have an opportunity to observe if the locomotive is switched to the roundhouse quickly, to avoid extra time to be paid to crew, waste of fuel, etc. He may note if car inspectors are on hand as quickly as possible to inspect the train, and if the train is going on to the next division he may note whether wasteful loss of time occurs through the actions of any of the departments concerned; he may visit the car inspector quarters, and if he looks about carefully he may find a few obsolete brass car bearings and car castings long cherished in some corner and kept for an emergency, that will never occur, because the "foreign cars that use them" are out of service long ago.

At the roundhouse the inspector may find worn out parts of injectors, lubricators, pumps, air brake parts and nondescript pieces of brass, and in the private locker of some foreman or charge hand he may find a collection of spare parts of obsolete devices, kept because they "may come in handy" some day.

If the inspector visits repair shops he may find obsolete car or locomotive castings, scrap cast or malleable iron, and scrap brass which should be disposed of more quickly, wheels of obsolete design or size of journal, or he may find broken bolts scrapped that should be recut, or he may have opportunity to point out improved methods of handling some small matters from ideas which he may have picked at another point on the system. In the storehouse he is likely to find supplies that have been in stock so long that it is obvious they are obsolete, but are kept as stock for bookkeeping reasons only. He may visit a terminal freight station and be able to point out the best methods for loading freight and way cars to avoid delay on the road or at transfer points with other railways, thus saving car delays.

And so on all over the system day in and day out, such an officer could be ever busy constantly watching for little leaks and studying more economical methods of handling detail. It may be argued that all this is the duty of the regular officers, which is true enough, but their duties are multiple, they have many questions cropping up daily; their routine work never ceases, and while, of course, they should never lose sight of the fact that strict economy is required, still it is not humanly possible for them to notice thousands of small leaks that are occurring, but which could be traced down and eliminated by an officer whose time was devoted to that and nothing else. It does not seem impossible if such an official were the right kind of a man that he could save any large railway system many thousands of dollars annually.

[The writer of the foregoing article, W. C. Hunter, was formerly Manager, New Brunswick Coal and Ry. Co., since resigning which position he has been railway representative for T. McAvity and Sons, Ltd., St. John, N.B.—EDITOR.]

Birthdays of Transportation Men in April.

Many happy returns of the day to—

F. T. Anderson, Car Service Agent, C.P.R. Western Lines, Calgary, Alta., born at Lambeth, Ont., April 1, 1878.

W. H. Ardley, General Auditor, G.T.R., Montreal, born at London, Eng., Apr. 24, 1858.

Jas. Black, Freight Claim Agent, C.P.R., Vancouver, B.C., born near Seaforth, Ont., Apr. 19, 1858.

C. G. Bowker, Joint Superintendent, G.T.R. and Wabash Rd., St. Thomas, Ont., born at Medford, N.J., Apr. 21, 1871.

W. J. Camp, Assistant Manager Telegraphs, C.P.R., Montreal, born at Oakville, Ont., Apr. 22, 1855.

G. Cobb, Chief Dispatcher, Reid Newfoundland Co., St. John's, Nfld., born at Coupar Angus, Scotland, Apr. 21, 1885.

A. E. Edmonds, District Passenger Agent, C.P.R., Detroit, Mich., born at Woodstock, Ont., April 8, 1866.

J. H. Flock, K.C., Honorary Counsel, Canadian Ticket Agents' Association, London, Ont., born at Toronto, April 6, 1834.

B. W. Folger, General Manager, Niagara Navigation Co., Toronto, born at Kingston, Ont., April 8, 1872.

B. C. Gesner, Moncton, N.B., formerly Air Brake Inspector, I.C.R., now travelling representative, Galena Signal Oil Co., born at Cornwallis, N.S., April 23, 1859.

J. Murray Gibbon, Advertising Agent, C.P.R., London, Eng., born at Udewella, Ceylon, April 12, 1875.

V. A. Harshaw, Superintendent, District 2, Atlantic Division, C.P.R., Woodstock, N.B., born at Mono, Ont., April 26, 1865.

J. M. Horn, District Freight Agent, Canadian Northern Ry., Edmonton, Alta., born at Allanton Mills, Lanarkshire, Scotland, April 12, 1880.

B. S. Jenkins, General Superintendent, C.P.R. Telegraphs, Winnipeg, born April 8, 1859.

J. Kyle, Master Mechanic, Western Division, Canadian Northern Ry., Edmonton, Alta., born at Toronto, April 11, 1877.

A. N. McIntyre, Trainmaster, C.P.R., Vancouver, B.C., born at St. Marys, Ont., April 9, 1874.

D. McNicoll, Vice President, C.P.R., Montreal, born at Arbroath, Scotland, April 7, 1852.

P. Mooney, General Freight and Passenger Agent, Halifax and South Western Ry., Halifax, N.S., born at St. Catharines, Que., April 19, 1871.

J. O. Norrie, Travelling Passenger Agent, C.P.R., Atlantic Steamship Lines, Winnipeg, born at Belfast, Ireland, April 20, 1879.

G. D. Perry, General Manager Great North Western Telegraph Co., Toronto, born at Whitby, Ont., April 19, 1858.

R. A. Pyne, Superintendent of Shops, C.P.R., Winnipeg, born at Toronto, April 10, 1874.

R. S. Richardson, Superintendent, Macdonnell & O'Brien, contractors, National Transcontinental Ry., La Tuque, Que., born at Napanee, Ont., April 9, 1865.

W. A. Ritchie, District Superintendent, Pullman Co., Montreal, born at Edinburgh, Scotland, April 13, 1854.

E. W. Smith, Superintendent, Dining and Parlor Car Service, G.T.R., Toronto, born at North Bridge, Mass., April 21, 1869.

W. S. Tilston, Chief of Montreal Board of Trade Transportation Bureau, born at Manchester, Eng., April 14, 1877.

W. Wainwright, Vice President, G.T.R., and Second Vice President, G.T.P.R., Montreal, born at Manchester, Eng., April 30, 1840.

W. Woollatt, Walkerville, Ont., ex-General Superintendent, Buffalo Division, Pere Marquette Rd., born at Weedon, Hertfordshire, Eng., April 2, 1855.

Equipment Directed for Snow Ploughs.

The Board of Railway Commissioners passed the following order 16007, Feb. 17:—

That all railway companies within the legislative authority of the Parliament of Canada operating snow ploughs shall, on or before Nov. 1, 1912, equip them with direct connection between the plough and the steam whistle of the locomotive, so that the man in the plough shall be able to give all proper signals; air gauge, air controlling valve and proper air connections between the plough and the locomotive, so that the air brake may be controlled from the plough.

That snow ploughs run as push ploughs, not fitted with cupolas, and having no men in charge, shall be fitted with air pipe connections between the plough and the locomotive, so that in case of derailment and air connections being broken, the air will apply automatically.

Canadian Northern Club of Toronto.

Officials and employes of the Canadian Northern Ry. and its allied lines in Toronto have organized the Canadian Northern Club of Toronto, for the exchange of ideas for obtaining and maintaining efficient service and for the improvement of the members in knowledge of construction and operation by discussion and investigation, and for the promotion of personal acquaintance and friendship. Meetings will be held on the first Tuesday of each month, at which papers will be read and discussed, with an occasional evening of entertainment.

Following is the organization:—Patrons, Sir William Mackenzie, Sir Donald Mann; Honorary President, D. B. Hanna; Honorary Vice President, H. K. Wicksteed, M. Can. Soc. C.E., G. H. Shaw; President, A. J. Hills; First Vice President, W. Phillips; Second Vice President, H. G. Hanna; Treasurer, J. W. Nicholson; Secretary, R. Croasdell; Chairman of House Committee, P. H. Scott; Chairman of Membership Committee, R. C. Vaughan.

Cross-Ties Purchased by Canadian Railways.

The data upon which this report is based were furnished by Canadian steam and electric railways. The value given for the ties was the cost at the point of purchase. There were 9,213,962 ties, costing $3,535,628, purchased in 1910 by steam and electric roads. This represents a decrease of 4,964,279, or 35% from the number purchased in 1909, due to the decreased purchase of ties for new steam railway lines. This decrease was general throughout the important species except with Douglas fir. The average cost of these ties at the point of purchase was 38c., an increase of 1c. over 1909. Table 1 gives the number of ties of each kind of wood purchased in 1909 and 1910, with their total and average cost, and the per cent. each species forms of the total.

Three kinds of wood supplied 77% of all the ties purchased. These were cedar, jackpine and hemlock. Though not as many cedar ties were purchased in 1909 as in 1910, cedar is still the chief species used. In 1910, it furnished 40% of the ties purchased as against 29.8% in 1909. Nearly all the cedar used is eastern cedar (thuja occidentalis), as western cedar (thuja plicata) is too soft for satisfactory use as cross-ties, except for electric lines where the traffic is light. Jackpine is the second in importance in tie production. In 1910 it supplied 23.5% of the ties used, which was practically the same percentage as used in 1909.

Table 1	1909				1910			
Kind of Wood.	Number.	Cost.	Average Cost Each	Per cent. Distribution.	Number.	Cost.	Average Cost Each	Per cent. Distribution.
		$	cts.			$	cts.	
Cedar	4,131,380	1,859,121	45	29.8	3,670,398	1,509,943	41	40.0
Jack pine	3,404,501	1,021,350	30	24.8	2,150,586	711,935	33	23.5
Hemlock	1,850,056	610,512	33	13.2	1,254,605	509,190	40	13.8
Douglas fir	653,403	225,258	34	4.6	885,480	261,582	30	9.6
Tamarack (larch)	2,811 820	1,096,610	39	19.8	663,922	241,092	36	7.1
Oak	34,389	21,292	62	0.2	264,647	195,135	74	2.9
Spruce	891,573	222,893	25	6.3	233,702	64,590	28	2.5
Cypress	8,362	3,010	36	(1)	44,489	16,561	38	0.4
Chestnut	84,669	49,809	59	0.7	19,184	12,243	64	0.2
White pine	92,633	27,519	29	0.7	1,838	661	36	(1)
Unspecified	213,462	72 577	34	1.6	25,111	12,696	50	0.2
Total	14,178.241	5,210,490	37	100.	9,213,962	3,535,628	38	100.

(1) Less than one-tenth of one per cent.

Hemlock, supplying 13.8% of the total consumption, occupied third position in 1910. Hemlock has now for the first time passed tamarack as a tie producer. The advance of hemlock from the fourth position, which it previously held, is due not to an increase in the use of hemlock, but to a decrease in the use of tamarack. Douglas fir formed 9.6% of the ties purchased in 1910, as against 4.6% in 1909. About 232,000 more Douglas fir ties were purchased in 1910 than in 1909. This species was used to a greater extent by both steam and electric railways. Tamarack ties have dropped from third place in 1909, when they formed 19.8% of the total, to fifth place in 1910, when they formed only 7.1%. In 1910 only 663,922 tamarack ties were purchased, compared with 2,811,820 purchased in 1909. This great decrease of 2,147,898 ties is found entirely in the number used by steam roads, and is due to the fact that the purchase of ties for the eastern half of the National Transcontinental Ry. was completed previous to 1910. The above five species, namely, cedar, jackpine, hemlock, Douglas fir, and tamarack, represent 94% of the total number of ties used. Nearly all the remainder is made up of oak and spruce. The number of oak ties purchased in 1910 was 264,647, an increase of 230,258 over 1909. This is due to one United States railway, operating in Canada, which is using a great proportion of durable woods. Aside from this road Canadian railways use oak ties chiefly for switch ties. The use of spruce, one of the cheapest ties, has fallen off greatly, 657,871 ties less being purchased in 1910 than in 1909. The decrease in the purchase of spruce is due to the same reason as that ascribed to tamarack. The remaining species, cypress, chestnut, and white pine, are used to a small extent for ties. All the cypress and chestnut ties and practically all the oak were imported from the U.S. Red pine and yellow pine, which were used in 1909, were not reported in 1910.

The average price of ties in 1910 was 38c., compared with 37c. in 1909. Of the important woods, oak cost the most, 74c. a tie, and spruce the least, 28c. a tie. Cedar cost 41c. a tie, compared with 45c. in 1909. Douglas fir cost 30c. a tie in 1910, or 4c. less than in 1909. The remaining woods, or all excepting these two, have advanced in price from 3 to 12c. a tie.

Table 2 gives the total number of ties purchased in 1910 by species and method of manufacture.

Table 2	Sawn Ties.				Hewn Ties.			
Kind of Wood.	Number.	Cost.	Average Cost Each	Per cent. Sawn.	Number.	Cost.	Average Cost Each	Per cent. Hewn
		$	cts.			$	cts.	
Cedar	472,797	154,693	31	13.0	3,197,601	1,355,250	42	87.0
Jack pine	837,079	307,724	37	39.0	1,313,507	404,211	31	61.0
Hemlock	589,451	152,948	26	47.0	665,154	256,242	55	53.0
Douglas fir	428,012	129,111	30	48.4	457,468	132,471	29	51.6
Tamarack	13,236	3,801	29	2.0	650,686	237,291	36	98 0
Oak	250,883	185,858	74	95.0	13,764	9,277	68	5.0
Spruce	134,898	39,611	29	57 8	98,804	24,979	25	42.2
Cypress	34,305	12,487	36	90.6	10,184	4,074	40	9.4
Chestnut	19,184	12,243	64	100.0				
White pine	438	101	23	23.8	1,400	560	40	76.2
Unspecified	11,388	6,521	58	45.3	13,723	6.175	45	54.7
Total	2,791,671	1,005,098	36	30.	6,422,291	2,530,530	39	70.

Approximately 70% of all the ties purchased in 1910 were hewn. It is apparent that methods of manufacture of ties are not undergoing any great general and permanent changes. Sawn ties were 30% of the total, which is the same proportion as in 1909. The only important species which has a majority of sawn ties is oak, 95% of which were sawn ties. Cedar ties were 81% hewn, and 61% of the jackpine ties were hewn. Hemlock and Douglas fir were about evenly divided in the method of manufacture. In the case of tamarack, 98% were hewn ties, while the minor varieties were principally sawn ties. The hewn ties are nearly all pole ties, the sawn ties are made chiefly from large timber.

Sawn ties cost on the average 36c. a tie. Hewn ties cost 3c. more, or 39c. a tie. Oak was the most expensive of sawn ties, costing 74c. a tie. White pine was the cheapest of the sawn ties, costing only 23c. a tie. In hewn ties oak was also the most expensive, costing 68c., and spruce ties were the cheapest, costing 25c. a tie.

Table 3 shows the number and cost of cross-ties used for steam railways in 1909 and 1910, classified by species, with the average cost per tie of each species and the per cent. each species forms of the total.

The steam railways, using 96% of all the ties, take them in about the same proportion and at the same prices as they are quoted in table 1. The decrease in use of ties in 1910, as noted above, is due chiefly to decreased purchase by the steam railways, which used 5,159,697 ties less in 1910 than in 1909. The average cost of steam railway ties is about the same as in table 1, due to the fact that nearly all the ties were purchased by steam roads. All the white pine and chestnut ties purchased in 1910 were purchased by steam roads.

Table 4 gives the number of ties purchased by steam roads in 1910, according to method by which made.

Steam roads use such a large proportion of the ties purchased that this table is practically the same as table 2. Hewn cypress ties were imported, but not used by steam roads.

Table 3	1909				1910			
Kind of Wood.	Number.	Cost.	Average Cost Each	Per cent. Distribution.	Number.	Cost.	Average Cost Each	Per cent. Distribution.
		$	cts.			$	cts.	
Cedar	4,079,414	1,838,609	45	29.5	3,525,228	1,457,419	41	39.6
Jack pine	3,404,501	1,021,350	30	24.6	2,146,586	710,915	33	23.2
Hemlock	1,844,762	608,830	33	13.3	1,230,815	500,281	40	12.8
Douglas fir	626,946	211,864	34	4.5	788,286	217,409	28	8.8
Tamarack	2,803,820	1,092,130	39	20.3	650,446	234,320	36	7.4
Oak	21,207	13,199	62	0.2	257,947	191.155	78	3.0
Spruce	889,659	222,373	25	6.3	229,676	62,641	27	2.6
Cypress	8,362	3,010	36	(1)	34,305	12,487	37	0.4
Chestnut	84,669	49,809	59	0.6	19.184	12,324	64	0.2
White pine	92,483	27,303	30	0.7	1,838	661	36	(1)
Unspecified	213,296	72.502	34	1.5	25,111	12,696	50	0.2
Total	14,069,119	5,158,979	37	100.0	9,109,422	3,412,227	38	100.

(1) Less than one-tenth of one per cent.

Table 5 shows the number and cost of cross-ties used for electric railways in 1909 and 1910, classified by species, with the average cost per tie of each species and the per cent. each species forms of the total.

The electric railways used 4% of all the ties purchased in 1910. In 1910,

195,411 more ties were used by electric roads than in 1909, an increase of 182%, mainly in the use of cedar and Douglas fir. This is due to much increased construction. Nearly 50% of the total number used were cedar ties at a cost below the average, namely, 37c. Douglas fir constituted 32% of the total. Jackpine, being at a distance from the electric railways, was used only to the extent of 0.6%, the ties costing 51c. each. In steam roads 23% of the ties used were jackpine, and they cost only 33c. each. Very little spruce and no chestnut or white pine was used in the construction of electric roads. Over 10,000 cypress ties were imported at an average cost of 40c. each. This is the first report of cypress ties being used for electric roads.

The average cost of ties used in 1910 by electric roads was 41c., compared with 47c. in 1909. This is due largely to the decrease of 2c. a tie in the cost of cedar ties and 12c. in the cost of Douglas fir ties. It is an interesting fact that, although the average tie used by electric roads is smaller than that used by steam roads, the price paid for it is generally greater, viz., 3c. a tie more in 1910. This is due not only to the disadvantages incident to contracts for smaller quantities of material, but also to the fact that the electric roads are more likely to purchase ties at points where the price includes railway transportation charges. This is shown by the electric roads paying not less than 37c.

Table 5 Kind of Wood.	1909 Number.	1909 Cost.	1909 Average Cost Each	1909 Per cent. Distribution.	1911 Number.	1911 Cost.	1911 Average Cost Each	1911 Per cent. Distribution.
		$	cts.			$	cts.	
Cedar	51,990	20,542	39	48.7	145,170	52,524	37	48.1
Douglas fir	26,457	15,394	58	24.7	97,194	44,173	46	32 2
Hemlock	5,294	1,682	32	4.9	23,790	8,909	37	7.9
Tamarack	8,000	4,480	56	7.5	13,476	6,772	50	4.4
Cypress					10,184	4,074	40	3.3
Oak	13,182	8,093	61	12.3	6,700	3,980	59	2.2
Spruce	1,914	520	25	1.8	4,026	1,949	48	1.3
Jack pine					2,000	1,020	51	0.6
White pine	150	216	1.44	0.1				
Unspecified	160	75	45	0.1				
Total	107,129	50,972	47	00.	302,540	123,401	41	100.0

This is a matter which for some years has been necessary for the preservation of the forests of Canada. At the same time it would have reduced the annual cost of railway maintenance. The average life of untreated ties as reported by the steam roads is: cedar, 9 years; tamarack, 8; hemlock, 7; Douglas fir, 7; jackpine, 6; spruce, 6. As may be noted from the tables, cedar is the species prin-

Table 4 Kind of Wood.	Sawn Ties, Number.	Sawn Ties, Cost.	Average Cost Each	Per cent. Sawn.	Hewn Ties, Number.	Hewn Ties, Cost.	Average Cost Each	Per cent. Hewn
		$	cts.			$	cts.	
Cedar	432,857	138,669	32	12.2	3,092,351	1,318,750	42	87.8
Jack pine	837,079	307,724	37	39.0	1,311,507	403,191	31	61.0
Hemlock	579,261	148,842	26	47.9	651,554	351,439	54	52.1
Douglas fir	369,483	100,045	27	46.9	418,803	117,364	28	53.1
Tamarack	12,554	3,554	29	1.9	637,892	230,766	36	98.1
Oak	244,933	182,328	75	95.0	13,014	8,827	68	5.0
Spruce	133,396	38,496	29	58.1	96,278	24,145	25	41.9
Cypress	34,30	12,487	37	100.0				
Chestnut	19,184	12,243	64	100.0				
White pine	438	101	24	23.8	1,400	560	40	76.2
Unspecified	11,388	6,521	57	45.3	13,723	6,175	45	54.7
Total	2,674,900	951,010	36	30.	6,236,522	2,461,217	39	70.0

for their ties, while many used by the steam roads were bought for 27c.

Table 6 gives the number and cost of ties purchased by electric roads in 1910, according to method by which made.

With electric roads 61.4% of the ties purchased were hewn, as contrasted with the steam roads, where 70% were hewn. Douglas fir constituted 50% of the sawn ties and cedar constituted 34%. Cedar made up 57% of the hewn ties, and Douglas fir 20.7%. The species which are chiefly used sawn are cedar, Douglas fir and oak. The species which are chiefly used hewn are hemlock, tamarack, cypress, spruce and jackpine. All the cypress and jackpine ties used were hewn.

The average price of hewn ties was 37c., or 2c. a tie less than was paid by steam roads. It is interesting to note that whereas with steam roads hewn ties cost 3c. a tie more than sawn ties, with electric roads sawn ties cost 9c. a tie more than hewn ties.

Imports from the United States of cross-ties in 1910 amounted to $1,096,832. Exports in 1910 were 1,995,582 ties at a value of $463,508. Of this total $376,913 was to the U.S. The balance of imports over exports was $633,324, which represents about 891,000 ties at the average price paid for ties in Canada in 1910.

PRESERVATION.—Two plants have been established for the chemical treatment of railway ties, one at Fort Frances, Ont., and the other near Winnipeg. It is stated that a plant will also be erected at Vancouver. The plant at Fort Frances will be capable of treating 2,000 ties a day. The zinc-chloride-aluminum patent immersing process will be used, which both prolongs the life of the timber and renders it fireproof. It is questionable if this process will give as good results in Canada as would creosote.

cipally used, because of its durability, but the supply of cedar is rapidly becoming exhausted. Unless preservative treatment of ties is introduced, the species of short life will have to be used untreated, which, on account of the necessary frequent renewal, will increase the cost of mileage maintenance. If

Table 6 Kind of Wood.	Sawn Ties, Number.	Sawn Ties, Cost.	Average Cost Each	Per cent. Sawn	Hewn Ties, Number.	Hewn Ties, Cost.	Average Cost Each	Per cent. Hewn
		$	cts.			$	cts.	
Cedar	39,120	16,024	40	72.5	105,250	36,500	35	27.5
Douglas fir	58,529	29,066	49	60.2	38,665	15,107	39	39.8
Hemlock	10,190	4,106	40	42.9	13,600	4,803	35	57.1
Tamarack	682	247	37	5.0	12,794	6,525	51	95.0
Cypress					10,184	4,074	40	100.0
Oak	5,950	3,530	68	88.8	750	450	60	11.2
Spruce	1,500	1,115	74	37.3	2,526	834	33	62.7
Jack pine					2,000	1,020	51	100.0
Total	116,771	54,088	46	38.6	185,769	69,313	37	61.4

treated ties were used, which would cost about 30c. extra per tie for creosoting and equipping with tie plates, the inferior species, which are very plentiful and cheap in Canada, could be used with economy. With such a treatment these woods would last at least 15 years, and if protected from wear would probably last much longer.

The lodgepole pine of the west would be greatly increased in usefulness by this treatment. This species is used chiefly for mining timbers and props, and occurs, fire-killed, in vast areas on the mountain slopes of Alberta and British Columbia. It cannot be used for lumber, on account of checking, and, if untreated, it lasts only about 5 years when used for railway ties. At present this wood stands dead and perfectly seasoned, and would take chemical treatment readily, after which it would make lasting and economical ties. By the use of such inferior qualities of timber, railway companies would assist conservation and at the same time decrease the cost of railway maintenance. The foregoing was issued recently as a bulletin by the Interior Department's Forestry Branch, having been compiled by H. R. MacMillan, B.S.A., M.F., and W. Guy H. Boyce. The zinc-chloride-aluminum process of tie preservation, which is being used by the Canadian Northern Ry. at Fort Frances, Ont., and the value of which, as compared with creosoting, is questioned, was adopted by the C.N.R. on the report of one of its officials, who recommended it in preference to creosoting.—Editor.]

Reduction of Industrial Accidents on Railways.—As the result of a campaign of education on the part of the Pennsylvania Rd. towards the reduction of industrial accidents on all parts of the system, more particularly in the shops, some remarkable results have been obtained. Whereas a year ago the industrial accidents averaged 8.7 per 1,000 employes per month, the number has now been reduced to 3.5, less than half. Shop inspection has, as a result of the beneficial results to be derived from this extra care, become a part of the P.R. Co.'s fixed policy. This inspection, the company claims, is made very reasonably, at a cost averaging $530 for each of the 66 shops inspected. Shop committees formed of the men themselves, render invaluable assistance, for it is by the care exercised by the individual workman that the results are largely obtained. Standing committees, the personnel of which is changed from time to time make various suggestions covering the improved construction and arrangement of the various tools and appliances around the shop, wherever such improvements would result in a greater safety to the workman without decreasing the efficiency of the machine.

The First Locomotive into Vancouver.

As illustrative of the rapid development of the locomotive during the last quarter of a century, an inspection of the three accompanying illustrations will prove interesting. The locomotive shown in figs. 1 and 3 is that used to haul into Vancouver on May 23, 1887, the first C.P.R. train from Montreal. Nearly a year previously, on July 4, 1886, the first C.P.R. train from Montreal to the Pacific Coast, reached Port Moody, on Burrard Inlet, which was the temporary ocean terminus. We are indebted to A. B. Calder, until recently General Agent, Passenger Department, C.P.R., Chicago, and now of Winnipeg, for the photograph, and to G. I. Evans, Mechanical Engineer, C.P.R. for the drawings of figs. 1 and 2.

Figs. 1 and 2 show more graphically the development of the locomotive during this past quarter of a century, both the drawings being to the same scale. Fig. 2 is one of the modern Pacific type locomotives now hauling passenger trains into Vancouver. The old 8-wheel or American type freight and passenger locomotive, fig. 1 is a C.P.R. class A6, with a 65% capacity, the new Pacific locomotives are of the C.P.R. class G2, with a 140% capacity. The present locomotive has a drawbar pull of 28,000 lbs., as against 13,000 lbs. of the older type of 24 years ago, the capacity being more than doubled.

The old locomotive, which is shown as fig. 3, on page 173, is still in active service, running out of Minnedosa, on the Manitoba Division, its number having been changed from 374 to 245.

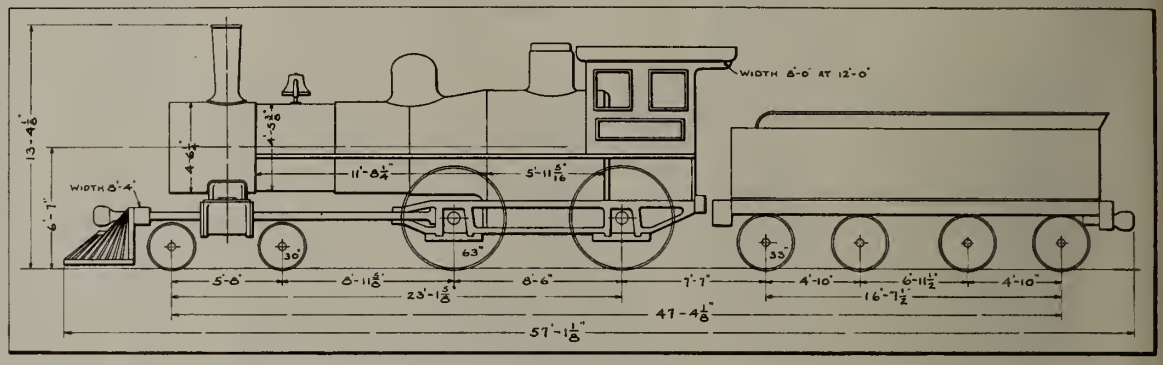


Fig. 1. Diagram of First Locomotive into Vancouver.

The Economic Organization and Maintenance of the Freight Car Repair Yard at a Terminal Point.

By J. Thos. Warde.

The question of the proper maintaining of a repair plant where there are from 200 to 250 cars repaired daily, is a very serious one, and calls for careful consideration, not only to handle the work expeditiously but also to handle it, in an economic manner.

The yard's location must be carefully selected. When possible, select a position where you can have 12 tracks of a capacity of 25 to 30 cars; tracks must be at least 16 ft. apart, alternate tracks, have a supply track of standard gauge and a third rail to form narrow gauge, and each end of yard should be connected by a lead. The yard must be well drained, and, if possible, equipped with sewer and water system, compressed air system, electric power and light, and the yard should also be as near shops, as possible.

I would recommend a central building under one roof, accessible from all parts of the yard, consisting of the foreman's office, general office, time office, stores, carpenters' shop, paint shop, oil house, triple rack, blacksmith and machine shop, men's lunch room and lavatory, also lumber racks, material platforms and racks, and wheel tracks for b.o. and serviceable wheels. The advantage of one building lies in the fact of one heating, this can be very economically arranged for, by an old boiler and fed by the scrap wood, etc., thus overcoming to a great extent the danger of fire, on account of having stoves.

By having a drive-over about the centre of the yard and a standard gauge track, with a third rail making a narrow gauge track with turntables at intersections, you can connect all supply tracks. This can be used for handling wheels as well as other material, and also as a means of keeping yard clear of scrap, etc.

The fact of supplying a repair yard with a sufficient supply of necessary tools, quick lifting jacks, etc., and machinery should not be lost sight of, as (supposing yard is equipped and wired for electricity) individual electric motor power is not only economical, but desirable for the running of machinery. It will be found economy to install cut-off and rip saw, band saw, buzz planer, little giant borers, drills, portable forges and riveting hammers for steel car repairs, with a capable man in charge and helpers, blacksmith's forges with electric power fans.

Oil house should have (underground, if possible) tanks. This point should have air device for emptying of oil barrels, should contain waste bin, oil tanks for soaking and proper treatment of, and making of dope.

Paint room should have a galvanized-iron covered table for cleaning of stencils, rack for storing stencils, iron tanks for paint, oil, etc.

The store room should be fitted with drawers, pigeon-holes, racks, etc., for the proper storing of material and small supplies.

The general office for use of assistant foreman, inspectors, clerks, etc., should have a private office for foreman in charge.

The efficiency of the organization depends on the executive and personal individuality of the foreman in charge. He should be a man of ability, an energetic nature and resourceful, his staff should average for the number of cars mentioned, six assistant foremen on a monthly salary, one inspector, four car oilers, 30 freight carpenters, 170 car repairers, 30 laborers, two painters, two assistant painters, one clerk, two boys, one storeman, one leading laborer, two checkers, one leading air cleaner and tester, eight cleaners and two testers, and one pipe man and helper.

The assistant foremen should oversee the work, under the general supervision of the foreman. These men should be taken from the rank and file, who have proved themselves adapted to the general overseeing of men and work; they should be practical and thoroughly conversant with the details of their work. The duty of the car inspector consists of inspecting all cars leaving yard, this man must be thoroughly conversant with the M.C.B. rules. Records of all foreign cars should be kept, re repairs. Repair and defect cards must be made and affixed according to M.C.B. rules.

The leading air brake tester should have charge of air brake cleaner, testers and pipe-man, and should be responsible under the car inspector for all air brake work. All triples should be

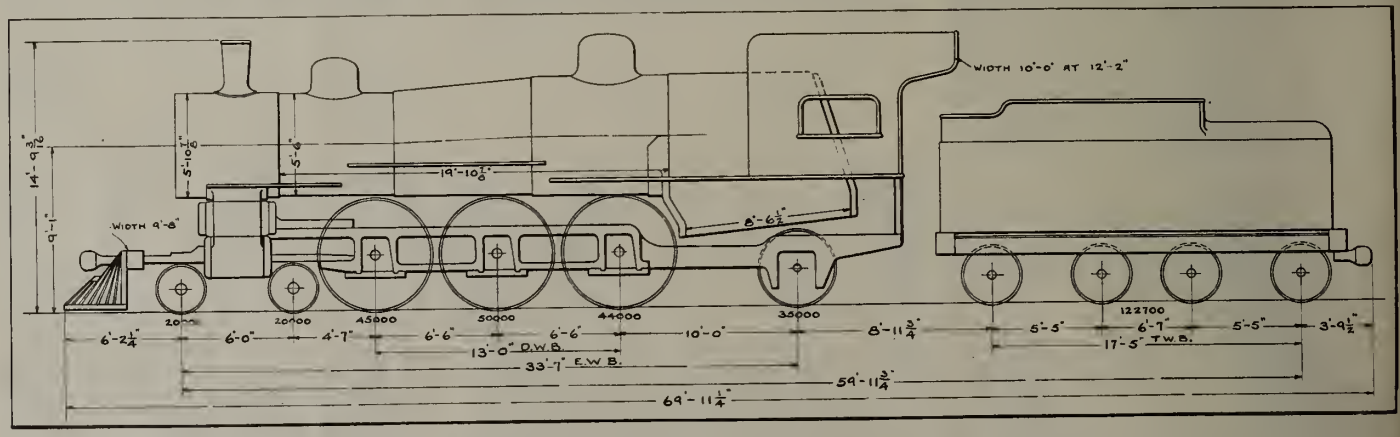


Fig. 2. Diagram of Modern Pacific Type Locomotive for Comparison with Early American Type Locomotive.

cleaned and tested at the triple-rack, and a stock kept on hand for replacement. It would be policy, although not recommended for a yard of this size, to have a leading car oiler; his duty would be to see that all matter is properly made, and a supply always on hand; he should inspect all boxes, and advise the oiler as to the re-packing. I recommend that a system be organized, and boxes re-packed and stenciled, and in the event of six months elapsing, pull box and renew packing, journal boxes, that a proper system be elapsing, pull box and renew packing, or in other words, renew the packing every six months; packing removed to be treated, and the oil and waste reclaimed. Two car checkers should be able to take record of repairs made to cars, same should be reported to foreman and filed. Cars handled should be recorded by index system, and I recommend that a system be adopted to show, time placed, time o.k., and dates, this can be handled by one of the boys. Carpenters and car repairers should be placed with assistant foremen as necessary, but no assistant foreman should have more than 40 men. Painters should have well in hand the work of painting, etc. All sheathing, roofing, etc., should be painted ready for use. The advantage in this is manifold, you have always something to keep your painters busy, your sheathing for patching is ready for the stencil, and finally your car is o.k.'d. in one day instead of three. Laborers should be under charge of a leading hand. His duties are manifold, from seeing that the scrap, etc., is gathered and placed in proper receptacles to seeing material placed at stores, also heavy material placed in a convenient position to handle. The storeman should have charge of supplies and be directly responsible for their up-keep. The foreman should furnish the general storekeeper every day a list of material supplied, attaching requisitions received and furnish list of requirements The foreman should be in close touch with stores and be in a position to anticipate requirements, this would be of mutual benefit both to storekeeper and himself. For clerk, I prefer training a man from the ranks of car repairers, as being familiar with the work, he can handle the position to advantage. The foreman should insist on a careful record being kept of all work supplies and general conditions as erecting work naturally falls to the repair yard. It is the foreman's duty to insist on maintaining an efficient staff, and the wrecking crew should not be less than 20 men taken from the car repairers. From these men selected, at least two of them should be first aid men holding certificates, and who have become conversant with the work. The men should be selected as required, according to nature of wreck; they should be under the charge of an assistant foreman, who should be held directly responsible for everything in connection with wrecking work, and the proper up-keep of the auxiliary equipment, and he and his crew should be available day or night. One man should be assigned to the duty of factotum of the dining and sleeping car, and be able to satisfy the inner-man; his duties would also include that of commissary, which is no small part of the wrecking equipment.

The auxiliary equipment should consist of a serviceable dining and sleeping car (an old coach makes a good car for this purpose), a tool car, heavy wrecking steam crane, block, tie and rail car, truck and wheel car. Tool car should be equipped with a first aid cabinet complete, with supplies and a modern equipment, quick lifting, traversing and other jacks, a plentiful supply of cables, tail ropes, chains and tools, and one man should be held responsible for their proper up-keep.

In arranging work for efficient handling on the repair tracks, a set of rules governing proper marking of cars by inspectors in the traffic yards would aid repair yard men, and the rules of marking of cars should be respected by switchmen in placing cars on the repair tracks. Defects should be classed, in A, B and C, or 1, 2 and 3 classes. Heavy work (three days) such as sills, roofs, etc., show A or 1 class, sill splices, ends, draught timbers, trucks, etc.; medium work (two days), as class B or 2; light, such as light patching, draught timber and gear bolts, brakes, side doors or any light work that can be handled in one day, show class C or 3. Tracks should be designated by the symbol or figure and cars placed as marked.

The foreman should place with yardmaster a switch list showing cars o.k. and location, listing cars he requires changed to other tracks to arrange his repairs, but the whole secret of success lies in co-operation with operating department, in providing a proper and efficient system of switching.

The foregoing paper was read before the Western Canada Railway Club in Winnipeg recently, the writer being chief clerk to the General Car Foreman, C.P.R.

In a brief discussion which followed A. McCowan stated that bad order cars had nothing to do with the freight congestion in Winnipeg, as far as the Canadian Northern Ry. was concerned.

Fig. 3. First Locomotive into Vancouver (See page 172).

Recent British Columbia Legislation.

The following acts affecting steam and electric railway interests were passed at the British Columbia Legislature's recent session:—

British Columbia Railway Act.—Amending general act.

Canadian Northern Pacific Ry.—Making provision for extension of lines on the mainland and in Vancouver Island.

Esquimalt and Nanaimo Ry.—Confirming agreement as to exemption of lands from taxation, and providing for building an extension to Courtenay.

Grand Trunk Pacific Ry.—Confirming agreement made between the G.T.P. Ry., the G.T.P. Development Co., the city of Prince Rupert, and the B.C. Government.

Kettle Valley Ry.—Ratifying agreement for building a line from near Merritt to the Fraser River; and confirming bylaw of Penticton municipality granting aid to the company.

Pacific Great Eastern Ry.—Act of incorporation. Confirming agreement with Foley, Welch and Stewart for building the line, and confirming agreement between Foley, Welch and Stewart and the G.T. Pacific Ry. for interchange of traffic, etc.

Railway Subsidy Lands.—Respecting repurchase by the crown of certain railway subsidy lands.

South East Kootenay Ry.—Extending time for construction.

Vancouver Incorporation Act.—Authorizing the city to provide a fund for the purchase of the British Columbia Electric Ry. on the expiry of the franchise if thought desirable.

The Montreal Tunnel Co. has been incorporated under the Dominion Companies Act, with a capital of $15,000,000, and office in Montreal, to construct railway, tramway and steamship terminals, transportation, warehousing and storage facilities, tunnels and approaches, yards, stockyards, stores, buildings, "of every description, and tracks and equipment for the movement, storage or handling of any merchandise or traffic, passenger facilities and accommodation," together with grain elevators, vessels, and various other businesses. The provisional directors are: D. McDonald, L. H. Timmins, D. McMartin, J. Carson, P. Dubee, H. A. Ekers, L. J. S. Morin, K.C.; J. M. Fortier, T. Bastein, Montreal. (Mar., pg. 121.)

During Jan., nine employes were killed and 12 were injured in the course of their work in connection with railway construction in Canada. Of the fatal accidents, five were caused by explosions, three by falling material and one by a collision.

Orders by the Board of Railway Commissioners.

Beginning with June, 1904, we have published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed our paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates given of orders, immediately following the numbers, are those on which the hearing took place, and not those on which the orders were issued. In many cases orders are not issued for a considerable time after the dates assigned to them.

16006. Feb. 17.—Authorizing C.N.O.R. to cross with its Montreal-Port Arthur line G.T.R. overhead in Nepean tp., mileage 14.2 from Ottawa.

16007. Feb. 17.—General order re air connections, etc., between snow ploughs and locomotives. (Published in full on another page.)

16008. Feb. 15.—Approving revised location of C.N.O.R. Toronto-Hamilton line through part of Toronto and York and Etobicoke tp., mileage 3.98 to 7.42 from Yonge St., Toronto, with leave to G.T.R. to apply to Board with regard to Belt Line property within 30 days, if so advised.

16009. Feb. 20.—Authorizing C.P.R. to take land for enlargement of Windsor St. passenger terminals, Montreal.

16010. Feb. 22.—Authorizing C.P.R. to open for traffic diversion of its line in Thunder Bay district, Ont., from mileage 92.24 to 93.42 and 93.92 to 95.12, and rescinding order 15932, Feb. 12, 1912.

16011, 16012. Feb. 23, 19.—Authorizing C.P.R. to use bridges 27.3, MacLeod subdivision, and 11.9 and 24.4, Souris subdivision.

16013. Feb. 19.—Authorizing C.P.R. to build spur for Britnell and Co. at Cooksville, Ont.

16014. Feb. 20.—Authorizing C.N.R. to build across five highways on its Prince Albert-Battleford line.

16015. Jan. 23.—Authorizing Nakusp and Slocan Ry. (C.P.R.) to build spur for 6 miles into Truro mineral claim, unsurveyed.

16016. Feb. 23.—Extending for 60 days time for installation of interlocking plant by Essex Terminal Ry., in Windsor, Ont., crossing to be used for construction purposes during extended period.

16017. Feb. 20.—Approving Klondike Mines Ry. standard freight mileage tariff for carload traffic C.R.C. 5.

16018. Feb. 20.—Ordering G.T.R. to file plans within two months for bridge where it crosses Perche drain, Sarnia tp., Ont.

16018. Feb. 22.—Ordering that plan approved by order 7200 and filed Apr. 27, 1909, re Toronto grade separation be amended by showing York St. opened to Lake St., and that subway full width of street be provided through elevated portion of tracks; question of compensation for land damages, etc., to be reserved.

16020. Feb. 24.—Authorizing James Bay and Eastern Ry. (C.N.R.) to cross road on lot 19, between r. 1 and 2, Dufferin tp., Que.

16021. Jan. 30.—Authorizing Georgian Bay and Seaboard Ry. (C.P.R.) to use bridge across road at mileage 56.4, Victoria county, Ont.

16022. Feb. 23.—Approving Napierville Jct. Ry. standard tariffs of maximum freight and passenger tolls C.R.C. 102.

16023. Feb. 17.—Authorizing G.T.P. Branch Lines Co. to build spur for Prince Albert Lumber Co., Prince Albert, Sask.

16024. Feb. 22.—Correcting errors in G.T.P. Branch Lines Co.'s Yorkton-Canora branch location plan.

16025. Feb. 23.—Relieving C.P.R. from fencing portions of its right of way, MacLeod subdivision.

16026. Feb. 23.—Authorizing C.P.R. to build spur for W. Milne and Sons, Shedden tp., Ont.

16027. Feb. 24.—Authorizing G.T.P. Branch Lines Co. to build its Cutknife branch across 11 highways in Saskatchewan.

16028. Feb. 20. — Approving standard freight and express tariff C.R.C. 6, for less than carload traffic.

16029. Feb. 26.—Appointing W. S. Senkler, senior judge Lanark county court, as arbitrator to assess damages to be awarded property owners injuriously affected by closing of streets, etc., by C.P.R. in Smiths Falls, Ont.

16030. Feb. 24.—Dismissing application of town of Dorval, Que., re G.T.R. early morning train into Montreal.

16031. Feb. 23.—Approving Napierville Jct. Ry. bylaw authorizing D. I. Roberts, General Manager, to issue tariffs of tolls.

16032. Feb. 24.—Dismissing application of city of Lachine, Que., for order directing G.T.R. to make Convent station the chief station there.

16033. Feb. 26.—Approving location of Dominion Atlantic Ry. North Mountain branch from Lakeville to Weston, 10 miles.

16034. Feb. 26.—Authorizing James Bay and Eastern (C.N.R.) to cross public road in Demeules tp., Que.

16035. Feb. 27.—Approving C.P.R. plans for transfer track with C.N.R. at Winnipeg.

16036. Feb. 24.—Authorizing G.T.R. to use bridge 45 at mileage 87.88, District 8, over C.P.R. and Scugog river, Ont.

16037. Feb. 27.—Authorizing M.C.R. to use drawbridge over Welland canal, just east of Welland station, Ont.

16038. Feb. 29.—Ordering C.N.O.R. to file plan within 30 days of overhead bridge, with clearance of 60 ft. over Metcalfe Road, Ottawa; city to pay cost in excess of that for 54 ft. bridge.

16039. Feb. 27.—Naming express collection and delivery limits for Fernie, B.C.

16040. Feb. 27.—Authorizing C.N.O.R. to cross public road between lots 6 and 7, con. B, Murray tp.

16041. Feb. 29.—Authorizing G.T.P.R. to build spur into Edmonton Portland Cement Co.'s premises.

16042. Feb. 29.—Authorizing town of Vegreville, Alta., to build Main St. across G.N.R.; company to move freight shed and coal house by Aug. 1; town to pay cost.

16043. Feb. 26.—Extending express collection and delivery limits for Lethbridge, Alta., rescinding order 15082, Sept. 8, 1911.

16044. Feb. 15.—Ordering C.P.R. to install home and distant signals with derails interlocked with swing portion of bridge over Trent canal at mileage 44, on Georgian Bay and Seaboard Ry.

16045. Feb. 28.—Authorizing C.N.R. to cross with its Rossburn line 18 highways in Saskatchewan.

16046. Feb. 29.—Authorizing T.H. and B.R., G.T.R. and Hamilton Radial Ry. to operate trains over interlocker near Ottawa St., Hamilton, Ont.

16047. Feb. 29.—Amending order 15152, Oct. 12, 1911, re Coxwell Ave. subway, Toronto city to maintain subway so as not to impair safety of G.T.R.

16048. Feb. 26.—Dismissing application of Chambre of Commerce, Montreal, relative to delays in delivery of goods in cars, and that railway companies pay demurrage on cars arriving in yards not delivered within 24 hours.

16049, 16050. Mar. 1.—Authorizing C.N.O.R. to build bridges over Black Sturgeon river, mileage 59.3 and 78, east of Port Arthur.

16051. Mar. 1.—Authorizing Iberville municipality, Que., to build highway across Central Vermont Ry. to connect range 6 public road with Grande Ligne road.

16052. Mar. 1.—Amending order 14979, Sept. 19, 1911, re taking of B. J. Coghlin and Co.'s land in Hochelaga ward, Montreal, by C.N.Q.R.

16053. Mar. 1.—Ordering that G.T.R. install gates to be operated from tower where it crosses Hope and Woodstock Sts., Tavistock, Ont., 20% to be paid from railway grade crossing fund, remainder by G.T.R.; 15% of maintenance and operation to be paid by Tavistock village.

16054. Mar. 1.—Dismissing application of J. M. Morin, K.C., for order to compel C.N.Q.R. to macadamize and keep in good repair highways and abutments of bridge between Bout de l'Ile and Charlemagne, Que.

16055. Feb. 29.—Authorizing C.P.R. to build spur for Canadian Equipment and Supply Co., Calgary, Alta.

16056. Mar. 1.—Authorizing C.P.R. to grant special rate to McGill University mining students from Montreal to Rossland, Phœnix and Greenwood, B.C., at $40 and return, and side trip, if desired, from Slocan Jct. to some point on Sandon branch at ¾c. a mile each way, and providing that other parties desiring to travel for same purpose to B.C. or other mining district be granted equally favorable terms.

16057. Mar. 1.—Ordering that Kingston and Pembroke Ry. jointly with C.P.R. file within 30 days, tariff establishing a rate of 10¾c. per 100 on ex-lake grain, in carloads, from Kingston to Montreal, including stopover at Almonte for milling purposes.

16058. Feb. 13.—Authorizing G.T.P.R. to cross highway in St. Francois Xavier parish, and to divert highway, mileage 119 to 119.3, Winnipeg district.

16059. Mar. 4.—Disallowing C.P.R. rate of 80c. per 100 lbs. on lumber from Port Arthur and Fort William to Vancouver, and ordering C.P.R. within 30 days to substitute a rate of 55c. per 100 lbs. on lumber, including flooring, in carloads of 40,000 lbs. minimum.

16060. Jan. 12.—Authorizing C.N. Alberta Ry. to build across G.T.P.R. in s.e. ¼ sec. 31, tp. 53, r. 10, w. 5 m., interlocking plant to be installed.

16061. Mar. 2.—Amending express classification 2 by making certain changes in newspaper rates from Winnipeg to Calgary.

16062. Mar. 4.—Approving location of C.P.R. Wilkie Northwesterly branch from mileage 0 to 12.86, and from mileage 26.85 to 32.15, and revised location from mileage 12.86 to 26.85.

16063. Mar. 1.—Authorizing C.P.R. to add 150 ft. to siding on lot 15, con. 1, Trafalgar tp., Ont.

16064. Mar. 1.—Authorizing municipality of Bridgeburg, Ont., to carry street over G.T.R. and M.C.R. by overhead bridge.

16065. Mar. 6.—Authorizing G.T.R. to rebuild swing bridge over Lachine canal, in Montreal.

16066. Mar. 6.—Exempting Vancouver, Victoria and Eastern Ry. from use of zinc covering over caps and intersections as required by order 11446, Aug. 2, 1910, where oil burning engines alone are used.

16067. Mar. 5.—Authorizing White Pass and Yukon Route to publish special tariffs for excursion business, etc., within less than statutory notice.

16068. Mar. 5.—Authorizing James Bay and Eastern Ry. (C.N.R.) to build bridge over Iroquois River, Ashuapmouchouan tp., Que.

16069. Mar. 5.—Approving plans for lowering pipe under M.C.R. in Wainfleet tp., Ont.

16070. Mar. 5.—Authorizing G.T.P.R. and C.N.R. to operate trains over interlocking plant in n.w. ¼ sec. 18, tp. 48, r. 25, w. 2 m., Sask., without coming to a stop.

16071 to 16074. Mar. 5, 6.—Authorizing C.P.R. to build spurs for city of Winnipeg; G. P. Sherwood and Co., Montreal; Stoneclough Quarry Co., near Coldwater, Ont.; and siding with spurs for St. Mary's Portland Cement Co., and rescinding orders 15667, Dec. 15, 1911, and 15969, Feb. 13, respecting the last named.

16075. Mar. 5.—Approving portion of C.P.R. Swift Current Southeasterly branch from mileage 40 to 45, and authorizing construction across three highways.

16076. Mar. 5.—Authorizing C.P.R. to build across highways from mileage 0 to 35.25, on its Bolssevain to Lauder branch, Man.

16077. Mar. 4.—Authorizing Georgian Bay and Seaboard Ry. (C.P.R.) to divert public road between cons. 7 and 8, Eldon tp., and to build across same at mileage 56.4 by overhead bridge, compensation to be paid J. McArthur for damage to property, and rescinding order 15987, in this connection.

16078. Mar. 7.—Authorizing C.N.R. to cross and divert public road on its Maryfield extension.

16079, 16080. Mar. 5.—Authorizing C.P.R. to build spurs for Sidney Brick and Tile Co., Sidney, Man., and Guelph Stove Co., Guelph, Ont.

16081. Mar. 5.—Approving location of C.N.O.R. Sudbury-Port Arthur line from mileage 2 at Current River, Port Arthur, to lot 5E, McGregor tp., at mileage 6.49.

16082. Mar. 7.—Approving revised location of G.T.P. Branch Lines Co. Regina-Boundary branch, mileage 84.22 to 91.13, Sask.

16083. Mar. 5.—Authorizing South Gower tp., Ont., to build highway across C.P.R.

16084. Mar. 7.—Approving revised location of G.T.P. Branch Lines Co. Regina-Boundary branch, mileage 17.02 to 84.22.

16085. Mar. 7.—Approving Central Ontario Ry. bylaw authorizing G. H. Shaw, Traffic Manager, C.N.R., to issue tariffs of tolls.

16086, 16087. Mar. 6.—Approving location of C.N.O.R. Montreal-Port Arthur line through Crerar, Dana, Janes and Davis tps., mileage 386 to 406 from Montreal, and through unsurveyed territory, Sudbury District, mileage 191.6 to 193.7.

16088. Mar. 7.—Authorizing C.P.R. to build spur for Chinook Coal Co., near Kipp, Alta.

16089. Mar. 8.—Ordering C.N.R. to cease from blocking lanes and streets in Brandon, Man., under penalty of $50 a day, and that it plank the track before May 1.

16090. Mar. 8.—Amending conditions of carriage and directions to agents in Express Classification 2. This is given in full on another page.

16091. Mar. 7.—Authorizing South Ontario Pacific Ry. to operate connection of its Guelph Jct. to Hamilton line with T.H. and B.R. for construction purposes only until May 31.

16092. Mar. 7.—Authorizing Vancouver, Victoria and Eastern Ry. to open for traffic its line from Princeton to Coalmont, 13 miles.

16093. Mar. 6.—Authorizing C.P.R. to build spur for city of Winnipeg.

16094. Mar. 6.—Authorizing G.T.P. Branch Lines Co. to build spur for Yellowhead Pass Coal and Coke Co., on Alberta Coal branch.

16095. Mar. 7.—Authorizing C.N.O.R. to take portion of lot 9, Brokenfront concession, Trenton, for diversion, as approved by order 12480, Dec. 7, 1910.

16096. Mar. 6.—Authorizing Midland Ry. of

Manitoba (G.N.R.) and G.T.P.R. to operate trains over crossing in parish lot 55, St. Boniface, Man., pending completion of interlocker.

16097. Mar. 8.—Authorizing G.T.R. to build branch through Holmedale district, Brantford, Ont., and across hydraulic canal and Grand River to its Brantford and Tillsonburg branch, District 20, and to close streets and highways in the city, compensation to be paid A. J. Wilkes for land taken.

16098. Mar. 11.—Approving revised location of C.N.O.R. Montreal-Port Arthur line through Capreol tp., mileage 426.53 to 429.29 from Montreal.

16099. Mar. 9.—Substituting plan A for plan filed and approved by order 15280, Sept. 11, 1911, re C.N.R. spur on Hudson's Bay reserve, Edmonton, Alta.

16100. Mar. 9.—Authorizing Central Vermont Ry. to rebuild bridge over Little Montreal River, between St. Lambert and Chambly, Que.

16101. Mar. 14.—Dismissing application of United Fruit Co., Berwick, N.S., re rate on apples to Winnipeg, Man.

16102. Mar. 4.—Authorizing C.P.R. to build subway at Decarie Ave., Montreal, to include diversion of Prudhomme Ave. by means of Western Ave., $10,000 to be paid from railway grade crossing fund, and one-fifth of balance by the city.

16103. Mar. 7.—Ordering G.T.R. at once to arrange that train no. 7 stop at Paris, Ont., to let off passengers from Toronto and points east thereof.

16104, 16105. Mar. 11.—Authorizing C.P.R. to use bridges at mileage 0.5, 94.3, and 81.4, Windsor subdivision, and at mileage 40.3, 42.1, and 43.8, London subdivision.

16106. Mar. 11.—Authorizing C.N.O.R. to cross public road in Trafalgar tp.

16107. Mar. 11.—Approving Bay of Quinte Ry. bylaw authorizing G. H. Shaw, G.T.R., to prepare and issue tariffs of tolls.

16108. Mar. 7.—Ordering G.T.R. before May 1, to install electric bell at crossing west of Bainsville station, Lancaster tp., Ont., 20% to be paid from railway grade crossing fund.

16109, 16110, Mar. 12.—Authorizing C.P.R. to use bridges 8.2 and 9.2, Cranbrook subdivision, and bridges 80.5 and 62.8, Sirdar subdivision.

16111. Mar. 4.—Authorizing G.T.R. to take lands in York tp., Ont., in connection with its Toronto grade separation.

16112. Mar. 5.—Relieving G.T.R. from further protection of crossing of Richmond Road, Nepean tp., Ont.

16113, 16114. Mar. 4.—Approving standard station designs for Algoma Eastern Ry., and for Algoma Central and Hudson Bay Ry.

16115. Mar. 2.—Rescinding order 13818, May 31, 1911, and authorizing city of Toronto to maintain wires across C.P.R. and G.T.R., and over G.N.W. Telegraph Co.'s wires to pumping station at foot of John St.

16116. Mar. 13.—Disallowing Boston and Maine Rd. tariff 1300, re rates on granite from Beebe Jct., Que., to Montreal, Ottawa, Toronto and other points.

16117. Mar. 14.—Substituting plan A for plans filed for transfer tracks between C.P.R. and C.N.R. at Carberry, Man., approved by order 16035, Feb. 27.

16118, 16119. Mar. 13.—Relieving C.P.R. from erecting fences along right of way, Kimberly and Crowsnest subdivision.

16120. Mar. 13.—Approving revised location of C.P.R. Moose Jaw Southwesterly branch from mileage 0 to 35.59, and location from mileage 35.59 to 37.85.

16121. Mar. 14.—Amending order 16065, Mar. 6, re G.T.R. swing bridge over Lachine canal, Montreal.

16123. Mar. 14.—Authorizing C.P.R. to build three spurs for St. Mary's Portland Cement Co., Blanchard tp., Ont.

16124, 16125. Mar. 14.—Approving location of C.N.O.R. station grounds at Fallowfield and Merrivale, Nepean tp.

16126, 16127. Mar. 14.—Approving location of C.P.R. station at Drake, Sask., and plan of station at Dysart, Ont.

16128. Mar. 15.—Relieving C.P.R. from erecting fences on its Cranbrook subdivision, B.C.

16129. Mar. 15.—Authorizing G.T.R. to build temporary bridge across Beauharnois canal, at milepost 48.98, District 13, Ottawa Division.

16130. Mar. 14.—Relieving G.T.R. from further protection of fourth crossing east of London city limits, Ont.

16131. Mar. 13.—Ordering G.N.R. to erect fences from milepost 63 to 77, by June 1, under penalty of $10 a day.

16132. Mar. 15.—Authorizing Pere Marquette Rd. to issue transportation to H. G. Shufelt, Ice Car Inspector, Dominion Department of Agriculture.

16133. Mar. 15.—Authorizing British Columbia Electric Ry. to cross Esquimalt and Nanaimo Ry., near Russell station, B.C., half interlocking plant to be installed.

16134. Mar. 15.—Approving C.P.R. plan of interlocking and derailing apparatus at Batiscan River bridge, Quebec subdivision.

16135. Mar. 14.—Approving changes and alterations in C.P.R. station at Dufferin Bridge, Ottawa, Ont.

16136. Mar. 15.—Relieving C.P.R. from erecting fences on its Sirdar subdivision, B.C.

16137. Mar. 15.—Authorizing Georgian Bay and Seaboard Ry. (C.P.R.) to cross two highways at mileage 82.89 and 82.02.

16138. Mar. 18.—Authorizing C.P.R. to rebuild bridge 66.6, Souris subdivision.

16139, 16140. Mar. 18.—Authorizing C.P.R. to build spurs across Montcalm St., St. Boniface, Man., and for city of Medicine Hat, Alta.

16141. Mar. 18.—Authorizing C.P.R. to file new location plan for its Molsons' St. Boniface branch, showing width of land coinciding with arbitration notice filed by it.

16142. Mar. 16.—Approving revised location of C.N.R. Swift Current Branch, mileage 78.29 to 124.96, Sask.

16143. Mar. 16.—Relieving G.T.R. from further protection of second highway north of Huntsville, Ont.

16144. Mar. 19.—Extending to April 1, time for installation of interlocker at Nipissing Jct., Ont., by G.T.R. crossing C.P.R. and connecting with T. and N.O.R.

16145. Mar. 20.—Ordering that York tp., Ont., shall build and maintain bridge over G.T.R. belt line east of Yonge St., Toronto.

16146. Mar. 19.—Authorizing C.P.R. to build bridge 85.2, Portal subdivision, Sask.

16147. Mar. 18.—Naming express delivery and collection limits for Ottawa, Ont.

16148. Mar. 20.—Substituting plan for plan filed showing diversion C.N.O.R. approved by order 13952, June 14, 1911.

16149, 16150. Mar. 20.—Authorizing G.T.R. to build sidings for J. Goodwillie and Sons, Welland, Ont., and J. T. Watson, York tp., Ont.

16151. Mar. 20.—Authorizing town of Claresholm, Alta., to extend Fourth Ave. across Calgary and Edmonton Ry.

The C.P.R.'s New Line from Glen Tay to Agincourt, Ont.

We are officially advised that the C.P.R. has let a contract to Deeks and Hinds, Toronto, for the construction of a line from Glen Tay to Agincourt, Ont., 184 miles. The contract includes grading, concrete work, and tracklaying, but not buildings and steel structures. The work will be gone on with at once, and the contract calls for its completion within two years.

The Dominion Parliament in 1904 incorporated the Campbellford, Lake Ontario and Western Ry. Co. to build a railway from the C.P.R. Montreal-Toronto line between Blairton and Ivanhoe, southwesterly to Cobourg, and thence westerly rejoining the Montreal-Toronto line between Locust Hill and Leaside Jct. The object in view was the provision of a line giving a more close connection with towns on the Lake Ontario shore than the G.T.R. gives, and to provide a competing line. The provisional directors included:—J. B. Ferris, Campbellford; H. J. Walker, Warkworth; G. F. Ferris, Cobourg; H. Barrett, Port Hope; J. J. Mason, Bowmanville; F. L. Fowke, Oshawa, and E. R. Blow, Whitby, all of which places it was proposed to reach by the new line. Public meetings were held throughout the district interested, preliminary surveys were made, and the C.P.R. was finally induced to take up the project. Various routes were gone over with a view of securing a suitable location, and the company's powers were extended from time to time, and in 1911 Parliament authorized the company to build the projected line from Glen Tay to near Agincourt. This decision was protested against by several of the towns which the original line would have served, with the result that while the new powers were given, the company retains the right to build through Campbellford, etc.

The surveys on the new route were completed during 1911, and the final plans were filed, after approval, Jan. 10, 1912. The new line starts from the present Montreal-Toronto line, at Glentay, 16 miles westerly from Smiths Falls, at the point to which a double line has been laid from Montreal. The route located makes straight for Belleville, 75 miles. The Kingston and Pembroke Ry. is crossed at Parham, and it is proposed, according to press reports, to build a branch from near Belleville, to the cement works at Point Ann. From Belleville the line keeps along the shore line south of the Canadian Northern Ontario Ry.'s Toronto-Ottawa line, passes through Brighton, Colborne and Grafton, and joins up with the C., L.O. and W. Ry. location, which was previously approved by the Government. This shows a route along the shore line passing through or near Cobourg, Port Hope, Newtonville, Newcastle, Bowmanville, Oshawa, and thence keeping midway between the G.T.R. and the Canadian Northern Ontario Ry. to a junction with the present line at Agincourt, eight miles east of Leaside Jct. The proposed line is to be a single track one, constructed to main line standard, and having a ruling gradient of 0.4%.

Sir Thos. G. Shaughnessy is reported as having stated in Toronto, Mar. 8, that the question of whether a carferry service across Lake Ontario would be operated in connection with the line, had not been considered.

New Brunswick Coal and Railway Co.

Following are extracts from the Commissioners' report for the year ended Oct. 31, 1911, which was presented to the New Brunswick Legislature recently:—

"We made reference in last year's report to the unsatisfactory progress being made by this company. We regret to say that there has been no improvement. For the whole year the total shipments have been only 2,605 tons, and for the past three months not a car has been shipped. To all appearances the coal mine has been abandoned. The Government has a security on the railway and fastenings as well as a deed of the right of way, so that no other creditors can legally claim them.

"The total cost of the road to Oct. 31, 1910, was $2,003,386.48; the amount expended for rolling stock, construction, bridges, ballasting, etc., during 1911 was $32,648.64; total. $2,036,035.12. The gross earnings for 1911 were $58,776.96, against $60,009.82, a decrease of 1,232.86. There was a falling off in freight traffic of $1,597, and in passenger traffic of $2,236; mails and express receipts declining by $85. These decreases are largely attributed to the interruption of traffic due to the fall of the steel bridge over the Washademoak River at Cody's, caused by the burning of one of the wooden piers. The operating expenses for the year were $78,-652.96, against $76,435.99 for 1910. The increase of $8,146 in the cost of maintenance of way over the previous year was largely due to the following items—rebuilding engine house at Minto, destroyed by fire, $700 over $2,000 received from insurance, replacing bridge at Cody's $3,127, increase in trackmen's wages $1,781.55, and against this there was a decrease in transportation expenses of $2,073. The gross earnings were $58,776.96, operating expenses $78,-652.98, deficit $19,876.02. The New Brunswick Premier, in submitting the report, stated that 6,286 ft. of sidings were provided during the year, and 28,068 new ties placed in the track, in addition to an expenditure on ballasting and on the Salmon Harbor branch.

The Central Vermont Ry. has equipped its New London Division with a telephone train dispatching system, this being the second division so equipped. The work was carried out under M. Magiff, Superintendent of Telegraphs, C.V.R., St. Albans, Vt.

Canadian Pacific Railway Construction, Betterments, Etc.

Access to Boston, Mass.—An order was reported in the Massachusetts House of Representatives, Mar. 16, inviting the C.P.R. to extend its lines through the state to Boston.

St. John, N.B.—The New Brunswick Legislature has under consideration an act confirming an agreement between the Dominion Government, the city of St. John and the C.P.R. in connection with the carrying out of improvements in the St. John harbor. In order to enable these to be effected the company surrenders to the city the 1,600 ft. strip conveyed to it in 1893, and other adjoining lands, and the city conveys these to the Dominion Government. In consideration of the transfer of these lands by the company the city agrees to grant the company certain other lands for 990 years at a rental of $1 a year. The company agrees to fill in the lands, and to utilize them as railway yards, or otherwise as may be required in connection with the extension of its facilities. The company also agrees, not later than May 1, 1918, to alter the location of its tracks on Germain St. on the westerly side of the harbor so that no tracks shall be located on the most westerly 20 ft. between Ludlow and Victoria Streets, and that it will provide a 20 ft. strip for use as a highway between Victoria and Union Streets. The city agrees that the taxes to be levied on the lands and improvements shall not exceed $100 a year, except in regard to any portion which may not be used as provided for by chap. 46 of 33 Vict. The Dominion Government agrees to build wharves and docks on the lands granted to it.

Northern Colonization Ry.—The Dominion Parliament has authorized the company to continue the "construction of its line from Labelle, Que., westerly to Rapide de L'Orignal (now called Mont Laurier), and on to Lake Temiscamingue in Pontiac county," and has extended the time for construction. The words within quotation marks are taken from the act. The company's line was extended some years ago to Nominingue, and it was proposed to extend it to Maniwaki, the terminus of the Ottawa, Northern and Western Ry. line along the Gatineau River Valley. Maniwaki is in Pontiac county, and there would be a straight route westerly to Ville Marie. The building of such a line, which is authorized by the Dominion Parliament this session, would provide a shorter and more direct line from both Montreal and Ottawa to Ville Marie, than the one also advocated via Mattawa and Kipawa.

Ottawa, Northern and Western Ry.—The Dominion Parliament has extended the time for the construction of the lines and branches authorized by chap. 84 of the statutes of 1899, and chap. 72 of the statutes of 1900.

Kipawa to Ville Marie, Que.—A deputation representing Pontiac county waited on the Quebec Government, Mar. 6, to urge the extension of the C.P.R. line now terminating at Kipawa to Ville Marie. The Premier stated that he had been advised by Sir Thos. G. Shaughnessy that the C.P.R. proposes to start the construction of a line to the north of Lake Timiskaming next spring. The Government proposes to set aside 4,000 acres of land a mile in aid of the railway. The construction of a line to the point named is necessary, and if the C.P.R. does not build it the Government will.

The C.P.R. has held a charter for the building of a line from Kipawa to Ville Marie for a number of years, but nothing has been done, and press reports state that if the C.P.R. reaches the lake it will be by means of the Northern Colonization Ry.

South Ontario Pacific Ry.—We are officially advised that track has been laid from Guelph Jct., Ont., for 7.56 miles. About seven miles of grading beyond the end of track is practically ready for the steel, and work is in progress to mileage 16.28, which is the point of connection with the Toronto, Hamilton and Buffalo Ry. at Hamilton. The principal work to be done, outside the track laying on the seven miles referred to, is trimming and some ditching. It is expected to have the line opened for traffic by June 1.

The Dominion Parliament has extended the time for the building of the lines authorized.

The Board of Railway Commissioners has authorized the operation of trains for construction purposes only, over the connection with the Toronto, Hamilton and Buffalo Ry. at Hamilton.

Ingersoll, Ont.—Press reports state that a $30,000 bridge is to be erected, and other improvements carried out at Ingersoll, Ont.

Entrance to Stratford.—The railway committee of the Stratford, Ont., city council, was advised, Feb. 29, to prepare the agreement and bylaw granting a right of way through the city on the south side of the river.

Guelph and Goderich Ry.—C.P.R. divisional officers visited Goderich, Ont., Feb. 28, and as a result it is said that plans are being prepared for the laying of new sidings, and the building of a 500 ft. freight shed on the pier.

London Improvements.—Plans were submitted to the London, Ont., board of works, Mar. 8, for improvements at Pall Mall. This is a local improvement, and is only indirectly connected with the larger proposals which have been under discussion for a considerable time.

Press reports state that in connection with the general improvement plans a large hotel will be built in the city, but we are officially advised that the first intimation the company had of the matter was the reports in the daily papers.

Collingwood Southern Ry.—At a meeting of the Collingwood, Ont., town council held recently to consider the proposition for the building of a line from Baxter into Collingwood by the C.P.R., it was agreed to grant certain properties to the company, a free right of way 50 ft. wide across any corporation property; to close up certain streets, and, subject to the rights of the G.T.R., to lay a single track on Walnut St.

The company's surveying staff completed their work Mar. 8, and local reports state that right of way agents have commenced acquiring the land required between Baxter and the Collingwood boundary.

Thunder Bay District Division.—The Board of Railway Commissioners has authorized the opening for traffic of the diversion of line mileage 92.24 to 93.42 and 93.92 to 95.12 in Thunder Bay district, Ont., and has rescinded a previous order dated Feb. 12.

Fort William Elevators.—Superintendent Armstrong is reported as stating that elevator D at Fort William, Ont., is to be enlarged by the addition of 2,000,000 bush. storage capacity, and that a large "hospital" elevator will be built.

Transfer Track at Winnipeg.—The Board of Railway Commissioners has approved plans for the building by the C.P.R. of a transfer track with the Canadian Northern Ry. at Winnipeg.

Red River Bridge.—Press reports state that a contract has been let to the Foundations Co., Montreal, for putting in the substructure of a new bridge across the Red River at Winnipeg, so as to enable two additional lines to be carried.

Manitoba Division Buildings.—Tenders are under consideration for the erection of locomotive house additions at Brandon and Arcola, for a new station building at Bredenbury, and for extensions to the freight office at Winnipeg.

Gimli Branch Extension.—It is reported that owing to representations made by the Manitoba Government, it has been decided to proceed at an early date with the extension of the Gimli branch to Riverton, on the Icelandic River, Man.

Brandon Yards.—J. A. McGregor, Superintendent, is reported as having stated that the improvements to be effected in Brandon, Man., include the doubling of the capacity of the present terminals, so as to enable the yard to be operated as a double one, and the rearrangement of tracks so that trains can enter and leave without interference. Six stalls are to be added to the locomotive house, and better provision is to be made for the repairing of cars.

Virden-McAuley Branch.—The Board of Railway Commissioners has approved location plans for the extension of this branch line from mileage 14 to 36.27.

Saskatoon.—The Saskatchewan Legislature has confirmed an agreement made Jan. 27, 1911, between the company and the city of Saskatoon. The city agrees to close up certain streets and hand over the area of the same to the C.P.R., which company agrees to pay $3,100 in cash and release the city from the payment of the balance owing on account of strengthening the bridge over the South Saskatchewan River. Provision is made for the opening up of certain new streets at some future time and their being carried across the railway.

Regina-Pasqua Second Track.—We are officially advised that a contract has been let to W. A. Dutton, Winnipeg, for the grading for a second track from Regina to Pasqua, Sask., 34.9 miles, and from Caron to Chaplin, Sask., 37.8 miles.

Swift Current Northwesterly.—Track has been laid to Cabri, Sask., on the branch northwesterly from Swift Current, Sask., and grading has been carried for some miles beyond Cabri. We are officially advised that a contract has been let to W. A. Dutton, Winnipeg, for the grading of an additional 80 miles.

Saskatchewan Division Buildings.—Tenders are under consideration for the building of a station at Weyburn, Sask.

Press reports state that the contract for an express building and two freight sheds at Saskatoon has been let to J. Simmons, Winnipeg, and that for a six-stall locomotive house and an express building at Swift Current to J. C. McDiarmid and Co., Winnipeg.

Weyburn-Lethbridge Branch. — The present end of track is at Viceroy, Sask., and we are officially advised that a contract has been let to Foley, Welch and Stewart for the construction of an extension for 100 miles westerly.

Construction is also to be started from the western end, and a contract has been let to J. Timothy, Edmonton, Alta., for building 25 miles from Stirling. A station on the Alberta Ry. and Irrigation Co.'s line just south of Lethbridge. The contractor's grading outfit reached Stirling Mar. 1, and work is reported to have been started.

Swift Current Southeasterly.—The Board of Railway Commissioners has authorized the opening for traffic of the branch line from Swift Current, Sask., southeasterly from mileage 40 to 45.

Wilkie Northwesterly.—The Board of Railway Commissioners has approved of location plans of the branch from Wilkie, Sask., northwesterly, sometimes referred to as the Manitoba Lake branch, from mileage 0 to 12.86, revised location plans from mileage 12.86 to 26.85, and location plans from mileage 26.85 to 32.15.

Plans have been filed in the Lands Titles office, Regina, Sask., and in the local office at Battleford, Sask., showing the route of the line starting from

Wilkie. northwesterly for 41 miles. Press reports state that surveys are being extended in the direction of Fort McMurray on the Athabasca River.

Kerrobert Northeasterly.—The Board of Railway Commissioners has approved of location plans for the branch line from Kerrobert, Sask., northeasterly, from mileage 0 to 20.2.

Suffield Southwesterly.—A contract has been let to J. G. Hargrave and Co., Ltd., Winnipeg, for the grading of a branch from Suffield, Sask., southwesterly for 30 miles into the southwest Alberta irrigated land section. This work will necessitate the handling of approximately 700,000 cubic yards of earth. The material will be free to handle; it is all prairie fill and will require no heavy machinery. A portion of the grade runs along about 3 ft. above the level and makes good shell work; the balance is good machine work. Work will be started as soon as weather conditions permit. Some part of the work, we are advised, will be sublet.

Bassano Northerly.—We are advised that on the line northerly from Bassano, Alta., the contractors, J. G. Hargrave and Co., Ltd., have some grading work to complete, and that as soon as this is done the entire construction crew and outfit will be moved to Suffield to start work on the 30-mile branch southwesterly from that point.

Calgary Shops.—In the very full description of the new shops which was published in our Feb. issue it was stated that the contract had been let to Westinghouse, Church, Kerr and Co. We have since been advised that they have been retained by the C.P.R. both as engineers and constructors. The work will also include the design and installation of the service equipment in the various buildings, including travelling and jib cranes, wiring systems for shop and yard lighting and power, air and steam piping systems for power and heating purposes, water supply for drinking and fire protection, plumbing and toilet facilities, drainage system, transfer tables and pits, coal and ash-handling equipment, necessary switchboard and transformer sub-stations. J. G. Sullivan, Chief Engineer, Western Lines, is in charge of the work.

Maharg to Calgary Second Track.—We are officially advised that it is probable that the second track to be built from Maharg, the site of the new shops, 4.5 miles east of Calgary station, to about one mile west of Calgary station, will be done by the company's own forces.

Calgary Hotel.—Press reports state that a contract has been let to the P. Lyall and Sons Construction Co. for the building of the C.P.R. hotel at Calgary, Alta. The contract is for the superstructure, the excavation and the foundations having been completed when the extension to the station was built.

Alberta Central Ry.—We are officially advised that it is intended to complete building the section of this projected railway from Red Deer to Rocky Mountain House, Alta., this year. It has not been decided when construction will be proceeded with.

Press reports from Red Deer, Mar. 10, state that the building of the superstructure of the bridge across the Saskatchewan River at Rocky Mountain House, Alta., will be started as soon as the material can be delivered. Several carloads of cement are being transferred from Red Deer to the site. The grading is nearly completed, and it is expected that track will be laid to Rocky Mountain House this season. The C.P.R. yards at Red Deer are being enlarged in view of the increased traffic which the opening of the new line will bring in.

Electrification of Lines.—Local press reports state that tenders have been asked for the electrification of the line from Castlegar Jct. to Rossland, B.C., and that A. H. Armstrong of the General Electric Co., Schenectady, N.Y., and H. D. Bayne, of the Canadian General Electric Co., Toronto, visited Rossland, Mar. 4, in connection with tendering on the work.

Hammond to Vancouver Second Track.—We are officially advised that a contract for this work has been let to Grant, Smith and Co., general contractors, Seattle, Wash.

Coquitlam Yards.—In connection with the laying out of the new yards at Coquitlam, B.C., it is reported that construction will be started at an early date on a two-mile spur line to serve industrial sites along the Pitt River. The contractors for clearing the yards site—M. P. Cotton Co.—expect to have the work completed by April 30. Grading is in progress for laying tracks on to the site for the purpose of facilitating building operations. The first building put up will be a 20-stall roundhouse, the site for which has been selected, and tests for foundation purposes are being made.

Tunnel in Vancouver.—J. Oborne, General Superintendent, had a conference with the Vancouver city council, Feb. 27, relative to the construction of a tunnel to connect the local yards on False Creek, with the terminals on the inlet. The tunnel would be 4,000 ft. long and would allow of the elimination of a number of level crossings. (Mar., pg. 127.)

Recent Dominion Legislation.

The following acts affecting transportation interests were assented to at Ottawa, Mar. 12:—

ALBERTA ELECTRIC RY. — Changing name to Alberta Interurban Ry., and authorizing organization upon certain conditions.

ALBERTA RY. AND IRRIGATION CO.—Defining powers as to issue of securities.

ALGOMA EASTERN RY.—Extending time for construction of certain lines.

BARCELONA TRACTION, LIGHT AND POWER CO.—Incorporation.

BARCELONA TRACTION, LIGHT AND POWER CO.—Respecting company's powers.

CALGARY AND FERNIE RY.—Extending time for construction.

CANADIAN NORTHERN ONTARIO RY. — Extending time for construction, and authorizing building of additional lines.

CANADIAN NORTHERN QUEBEC RY.—Extending time for construction and authorizing building of additional lines.

CAP DE LA MADELEINE RY.—Declaring line to be for the general advantage of Canada, and authorizing amalgamation with C.P.R.

COLLINGWOOD SHIPBUILDING CO.—Authorizing payment of subsidy for building drydock at Collingwood, Ont.

Canadian Pacific Railway's Station at Calgary, Alta.

DOMINION ATLANTIC RY.—Extending time for building North Mountain branch.

ERIE, LONDON AND TILLSONBURG RY.—Extending time for construction.

HAMILTON, WATERLOO AND GUELPH RY.—Increasing capital stock and extending time for construction.

HIGH RIVER, SASKATCHEWAN AND HUDSON BAY RY.—Incorporation.

INTERPROVINCIAL AND JAMES BAY RY.—Extending time for construction.

KOOTENAY AND ALBERTA RY.—Extending time for construction.

MONTREAL HARBOR COMMISSIONERS. — Authorizing further advances for harbor improvements.

NATIONAL TRANSCONTINENTAL RAILWAY.—Extending time for building Western division, and authorizing one commissioner instead of four.

NORTHERN COLONIZATION RY.—Extending time for construction.

NORTHERN TERRITORIAL RY.—Incorporation.

OTTAWA, NORTHERN AND WESTERN RY.—Extending time for construction.

PACIFIC AND ATLANTIC RY.—Extending time for construction.

SOUTH ONTARIO PACIFIC RY.—Extending time for construction.

VANCOUVER ISLAND AND EASTERN RY.—Extending time for construction.

WEST ONTARIO PACIFIC RY.—Extending time for construction.

Canadian Northern Ry. Construction Betterments Etc.

James Bay and Eastern Ry. — The Board of Railway Commissioners has approved locations plans for the line through Demeules tp., Que.

Canadian Northern Quebec Ry. — The Dominion Parliament has extended the time for the construction of the lines authorized by paragraphs c, e and f, sec. 3, chap. 73, of the statutes of 1907; the lines of the Quebec, New Brunswick and Nova Scotia Ry. authorized by sec. 7, chap. 178 of the statutes of 1903; the lines of the Great Northern Ry. authorized by sec. 1, chap. 104 of the statutes of 1906, and the lines of the Chateauguay and Northern Ry., authorized by sec. 2, chap. 75 of the Quebec statutes of 1899. All these lines are at present partially constructed. The company is also authorized to enter into agreements with the Canadian Northern Montreal Tunnel and Terminal Co.

Engineers are reported to be making surveys for a line from St. Eustache to St. Jerome, Que., one of the lines for the construction of which an extension of time has been obtained.

Canadian Northern Montreal Tunnel and Terminal Co.—The plans for the projected tunnel under Mount Royal, the passenger and freight terminals in Montreal, and the overhead lines to the river front were laid before the board of control, Feb. 26, and are still under discussion.

The Dominion Parliament passed the bill incorporating a company for the purpose of building the tunnel and terminals, Mar. 15.

Canadian Northern Ontario Ry.—The Dominion Parliament has passed an act extending the time for the construction of the lines authorized by sec. 3, chap. 110, of the statutes of 1905; the uncompleted portion of the line authorized by sec. 3, chap. 50, of the statutes of 1895; repealing subsection one and par. b of subsection 2, sec. 7, chap. 72, of the statutes of 1907; authorizing the construction of a line from between Port Arthur and Sudbury near Long Lake to the National Transcontinental Railway east of Lake Nipigon, and a line from Chisholm tp. to the Central Ontario Ry. between Bancroft and Whitney; fixing the amount of securities to be issued under sec. 3, chap. 57, of the statutes of 1911 at $40,000 a mile to be issued in proportion to the length of line constructed or under contract, and authorizing entering into agreements with the Canadian Northern Montreal Tunnel and Terminal Co. and the Toronto Eastern Ry.

The line under construction from Toronto to Ottawa, which has been in operation for some time as far as Trenton, was reported completed as far as Desoronto, Feb. 29. At this point connection is made with the Bay of Quinte Ry. and trains will run over it as far as Sydenham, whence the line is under contract to Ottawa. Some betterment, including a couple of cut offs, have been done on the B. of Q. Ry. in order to provide for heavier traffic. A freight service is being operated from Toronto to Sydenham, but it is not expected that a passenger service will be put on until the summer.

The plans for the extension of the line from Toronto via Hamilton to Buffalo, and westerly from somewhere near Hamilton to Windsor or Sarnia, or both, under the Toronto, Niagara and Western Ry. charter, have formed the subject of considerable discussion for some time past in Hamilton, the Niagara peninsula, Brantford, London, St. Thomas, and other western Ontario towns. The question of the entrance into Hamilton is the most important of the points involved, and this has been discussed with the city officials and the city council, but no definite approval of the plans has yet been given by the city council. Sir Wm. Mackenzie is reported as stating that no line had been located west of Brantford, and that what would be done beyond that point would be considered in the future, but, he added, "it is getting to be the very near future now."

Montreal-Ottawa-Port Arthur Line.—The Minister of Railways, replying to questions in the House of Commons, Mar. 4, said the Dominion Government has not guaranteed the bonds of the C.N.R. or of any of the lines connected with it, which are a charge upon the terminals at Montreal or Winnipeg. The moneys realized from the sale of the securities of the Canadian Northern Ontario Co.'s railway, guaranteed by the Dominion under chap. 6 of the statutes of 1911, are being applied in aid of the construction of a line from Montreal to Port Arthur, as provided by the act and the deed of trust made thereunder. Such sums only are paid out of these moneys as the Chief Engineer of the Department of Railways certifies as justified having regard to the proportion of work done as compared with the work of construction of the whole line.

In connection with the plans for the entrance of the company's lines into the centre of Ottawa, the Board of Railway Commissioners has directed the company to build a bridge over Metcalfe road, having a clearance of 60 ft., the city to pay cost in excess of that of a 54 ft. bridge.

On Oct. 13, 1908, the Minister of Railways approved a route plan for a line from Ottawa to Key Harbor, Ont. The route plans of the Ottawa-Port Arthur section of the Montreal-Port Arthur line, which are now being approved in short sections by the Minister, follow the route of the line approved in 1908 as far as Chisholm tp., and then proceed northerly crossing the C.P.R. transcontinental line at Nipissing Jct., and passing through North Bay, join the C.N.O.R. Toronto-Sudbury, etc., line just north of Capreol, Ont. The Board of Railway Commissioners has approved of revised location plans for the line through Crerar, Dana, James and Davis townships, mileage 386 to 406 from Montreal; through Capreol tp., mileage 426.53 to 429.29 from Montreal; through unsurveyed territory in Sudbury district, mileage 191.6 to 193.7, from Sudbury Jct.; and from Current River, Port Arthur, mileage 2 to mileage 6.49. W. H. Grant, Manager of Construction, recently completed a trip of inspection over the eastern half of the line, and is reported as having stated in an interview that work had been gone on with during the winter at different points and that by July it was expected that 10,000 men would be at work. Unless it was impossible to get a sufficient number of men on, the line would be completed by the end of 1913, by which time it was also expected that the extension from Edmonton to the Pacific coast at Port Mann and Vancouver would be completed.

Duluth, Winnipeg and Pacific Ry.—We are officially advised that the company does not contemplate building coal docks and grain elevators at Duluth, Minn., in the immediate future, as stated in recent press reports.

Canadian Northern Ry.—Preparations are being made in Port Arthur, Ont., for starting work on a new steel dock, to be built alongside the present one, at a cost of $30,000. It is stated that the dock is to be completed in three months. The contract for its erection has been let to the Barnett and McQueen Co. It is also reported that the Barnett and McQueen Co. will build during the present season a large addition to the company's grain elevators at Port Arthur.

The betterments to be done on the line between Port Arthur and Winnipeg include the completion of the revision work at Rainy Lake, which has been in progress for some time, and the replacing of a number of Howe truss spans with steel structures on concrete piers and abutments. The Rainy Lake revision work was fully described in our issue of July, 1911, page 621. A contract has been let to S. Brown for the substructure of a double track bridge across the Seine River near Winnipeg, and work has already been started.

A new freight yard will be laid out on the east side of St. Boniface, about 2.5 miles from Winnipeg. The first section built will have a capacity of 700 cars, but the area of land secured by the company provides room for the laying of 100 miles of track.

Plans have been filed with the Board of Railway Commissioners for the building of a new bridge at the foot of Bell Ave., Winnipeg, for freight tracks.

The construction programme for the year includes the completion of the line started last year from near Winnipeg to Winnipeg Lake. This is an extension of the Bird's Hill branch, which was started in July last year under the Winnipeg and Northern Ry. charter, the mileage for which T. Edwards had the contract, is to be finished this year, and a further mileage to Lake Winnipeg is to be put under contract and finished this season. The present objective point of this line is Fort Alexander.

The betterment work to be undertaken this year on the main line west of Winnipeg includes the increase and improvement of terminal facilities generally, wherever required, and the relaying of the track between Portage la Prairie and Grand View, Man., 151 miles, with 80 lbs. rails instead of the present 60 lbs. ones.

We are officially advised that engineers are locating a line from Portage la Prairie towards Morris, and thence towards Stuartburn, Man. The object of this line would be to enable traffic to be carried from the lines west of Portage la Prairie to a connection with the main line east of Winnipeg, without passing through that city, and so relieve the congestion there.

A new freight terminal is being laid out in Regina, Sask, covering the block bounded by Angus and Albert Streets, and Eighth and Dewdney Streets. A freight shed 255½ ft. by 41 ft. is to be built along Albert St. About 30 ft. of the length of the shed will be used as customs offices and bonded rooms. At the Dewdney St. end of the shed will be a 2-storey and basement concrete and brick office building 41 ft square. There will be four tracks in front of the shed. On the Angus St. side of the yard will be a loading platform and three sets of tracks with a 10-ton transfer crane having a 32-ft. span.

The Saskatchewan Legislature extended, Dec. 31, the time within which certain branch lines, being built under sec. 6, chap. 3, of the statutes of 1908-9 may be completed. Another act has been passed declaring that a line from Craven, on the Craven branch of the Qu'Appelle, Long Lake and Saskatchewan Ry., northerly, west of Last Mountain Lake to the C.N.R. between Adam's Ferry and Brancepeth, about 40 miles, mentioned in the deed of trust dated Mar. 18, 1909, shall be replaced by a line to be built from Craven northeasterly and northerly for 40 miles.

The Saskatchewan Legislature incorporated the Canadian Northern Saskatchewan Ry. Co., of which F. H. Phippen, K.C., A. J. Reid, K.C., G. G. Ruel, R. H. M. Temple, and S. P. Biggs, Toronto, are named provisional directors, to build the lines mentioned in our last issue. The company may issue bonds for $30,000 a mile in respect of lines south of the North Saskatchewan River, and for $40,000 a mile in respect of lines north of the same river. Another act has been passed, under which the pro-

vincial Government aids in the building of these lines by guaranteeing the principal and interest of the company's bonds for $13,000 a mile. The money raised is to be held in trust by the Government and paid out as the work on the several lines proceed upon the certificate on the order of the provincial Minister of Railways. Construction is to be gone on with this year and all the lines are to be completed by Dec. 31, 1914.

We are officially advised that the construction programme for this year covers a large mileage in Saskatchewan and Alberta. Starting from Radville, on the extension from Maryfield, a line to Moose Jaw, Sask., 86 miles, was put under contract last year. This will be finished this year. About five miles of grading has to be completed at the Moose Jaw end. The Cowan Construction Co. has the contract. An agreement has been reached with the Moose Jaw city council as to the entrance into the city, and at a recent meeting at which the agreement was finally settled it was stated that the extension would be in operation into the city by Aug. 1, and that the station and other buildings would be completed by July 1.

Beyond Radville the Maryfield extension is being operated to Bengough, and we are advised that it will probably be extended further west in the direction of Lethbridge this year. No contract has yet been let.

The line from Saskatoon, Sask., through the Goose Lake country, which is now operated to Alsask, will be continued westerly.

The Thunderhill branch, which is in operation from Swan River, Man., to Preeceville, Sask., will be extended for 30 miles. No contract has yet been let.

The line from Prince Albert to Battleford, Sask., is being operated to Blaine Lake, 64 miles, and is to be completed this year. Some work has to be finished on the mileage put under contract last year, but no contract has been let for this year's work.

The branch from Vegreville to Calgary, which is now being operated to Drumheller, will be completed by the Northern Construction Co.

It is proposed to start construction at Manson, Alta., 11 miles north of Drumheller, on a line 130 miles easterly to meet the extension of the line from Saskatoon, being built westerly through the Goose Lake country. The contract for grading this 130 miles has not yet been let.

A line is projected from Calgary to Macleod, Alta., on which it is possible some grading will be done this year, but no contract has been let. A contract was let in 1911 to the Cowan Construction Co. for grading about 35 miles southwesterly direction from Macleod, and this is to be finished up this year.

From Warden, Alta., about four miles south of Stettler, on the Vegreville-Calgary line, a line is under construction to the Brazeau River coal fields, 170 miles. The Northern Construction Co. will complete the grading started last year, and complete the whole line this season.

On the line to Athabasca Landing, Alta., about 10 miles of track have yet to be laid. This will be done as early as possible. The Northern Construction Co. has the contract.

On the main transcontinental line track has been laid to the Pembina River, Alta., and here a large bridge is being built, which it is expected to have completed in May. As soon as the bridge is finished tracklaying will be resumed and carried on to the Macleod River, 63 miles. Another large bridge has to be erected at this point, which it is expected will be completed by Sept., when track laying will be carried to the end of the grading at present completed, 166 miles from St. Albert. It is expected that grading will have been completed to the Yellowhead Pass, about 250 miles from St. Albert, Alta., by the end of the year, and that track will also be laid. The contract for this section of the line is held by the Cowan Construction Co. and the Northern Construction Co.

The revised route map of the C.N.R.'s projected line from Edmonton to Red Deer, Alta., which has recently been approved by the Minister of Railways, starts from Strathcona, and keeping west of the C.P.R. Calgary and Edmonton Ry., finally crosses it at Lacombe, and joins up with the surveys of the Canadian Northern Western Ry. near Red Deer river. Crossing the river a few miles south the line passes through Red Deer, and keeping between the C.P.R. C. and E. Ry. and the G.T. Pacific Ry., enters Calgary from the southeast on the same right of way as a line now under construction from the east.

The House of Commons has under consideration a bill amending the act of 1910 guaranteeing Canadian Northern Alberta Ry. securities in respect of 150 miles of line westerly from St. Albert.

Canadian Northern Pacific Ry.—The Premier, in answer to questions in the British Columbia Legislature, stated recently that bonds for £1,438,356 were issued by the company, Nov. 18, 1911 which had been guaranteed by the Government; the security deposited with the Government consisted of 5,000 fully paid up shares of the Canadian Northern Ry., of the value of $500,000. The company had not made any application for any land grant under the schedule.

The British Columbia Legislature has passed an act providing for the extension of the C.N.P.R. lines. It is provided that the company shall build 150 miles from the 100th milepost on the Vancouver Island line authorized to be built under the agreement confirmed by chap. 3 of the statutes of 1910, to the east coast of the island, as arranged by order-in-council of Jan. 27; from Kamloops to Vernon, and Lumby; from Vernon to Kelowna via Long Lake; and from Vernon to the east arm of Okanagan Lake, opposite Okanagan Landing. These latter lines will have a total length of 145 miles, and were approved by order-in-council Jan. 26. The province agrees to guarantee the company's bonds in respect of these mileages for $35,000 a mile. Construction of these lines is to be started within six months, and they are to be completed within three years of the passing of the act.

T. G. Holt, Executive Agent, and T. H. White, Chief Engineer, completed a trip of inspection over the line under construction from Port Mann as far as Kamloops, B.C., Mar. 12, and are reported to have said that everything is well forward. Satisfactory progress is being made with the driving of the 2,080 ft. tunnel at Yale, which is expected to be completed in Sept. (Mar., pg. 137.)

Recent Quebec Legislation.

In the Quebec Legislature, Mar. 14, the following acts affecting transportation and allied interests were assented to:—

ENGINEERS' CLUB OF MONTREAL.—Amending act of incorporation.

MONTREAL ST. RY. MUTUAL BENEFIT ASSOCIATION.—Amending charter.

RAT RIVER RY.—Incorporation.

ST. CHARLES AND HURON RIVER RY.—Incorporation.

SHERBROOKE RY. AND POWER CO.—Amending act of incorporation.

Bever, Peacock and Co., locomotive builders, Manchester, Eng., have been licensed by the Quebec Government to deal with immovable property in the province for any operations it has a right to carry on under the British charter.

Pacific Great Eastern Railway

The British Columbia Legislature has incorporated a company with this title to build the following railways:—From Vancouver to North Vancouver, thence along the margin of Howe Sound, and the general course of the Squamish River, and continuing northeasterly to Lillooet, on the Fraser River; along the bank of the Fraser River to a junction with the Grand Trunk Pacific Ry. at Fort George, about 450 miles; and such other lines as may be authorized to be built from time to time by order-in-council. The provisional directors are: T. Foley, St. Paul, Minn.; P. Welch, Spokane, Wash.; J. W. Stewart, D. McLeod, Vancouver; V. W. Smith, Hazleton, B.C.; D'A. Tate, Winnipeg, Man.

Another act has been passed confirming agreements made between the Government and Foley, Welch and Stewart for the building of the line, and between Foley, Welch and Stewart and the G.T. Pacific Ry. and the G.T.P. Branch Lines Co., as to the interchange of traffic and as to the terms upon which control of the line may be obtained. The province agrees to guarantee the bonds issued in respect of the construction of the line to the extent of $35,000 a mile, at 4% for 30 years, taking a mortgage of the line, exclusive of terminals, but including buildings, equipment and rolling stock. The money raised by the sale of such securities is to be held in trust by the Government and paid out from time to time during the progress of construction, upon the certificate of an officer to be appointed. Construction is to be started within three months after the signing of the trust deed securing the mortgage, but not later than July 1, within 10 miles of Vancouver, and there has to be expended an amount equal to the cost of 75 miles within a year; an amount equal to the cost of 175 miles during the next year, and the balance during the third year, so that the whole line shall be fully completed by July 1, 1915. The contractors agree to provide adequate terminal facilities in Vancouver, and are given permission to use any bridge other than their own in crossing Burrard Inlet. The Government grants a free right of way 100 ft. wide through any crown lands, land for stations, sidings, yards, etc., from any vacant crown lands, and exempts the railway and all its property from taxation until July 1, 1926. The railway is not at any time to be declared to be a work for the general advantage of Canada.

The second agreement confirmed by the act provides for the use by the P.G.E. Ry. of the G.T. Pacific Ry. terminals at Fort George; the general interchange of traffic between the two companies; the preference of the Canadian Express Co. and the G.T. Pacific Telegraph Co. to carry on their business over the line, provided the rates are as favorable as those offered by any other company; the exclusive right to operate sleeping cars over the line, provided the P.G.E. Ry. does not operate its own cars; and a provision that the G.T.P. Ry. shall have an option for 60 days to acquire the controlling interest in the P.G.E. Ry. after having received notice that a proposition for its purchase has been received by Foley, Welch and Stewart.

The valuation for taxation purposes of the Michigan Central Rd. property in St. Thomas, Ont., has been fixed at $450,000.

Prof. H. O. Keay, McGill University, read a paper on technical education and the operating department of a railway before the Canadian Railway Club in Montreal, March 12.

National Transcontinental Railway Construction.

The Dominion Parliament has passed three acts affecting the National Transcontinental Railway. The first extends the time limit for the building of the Western Division, which is being built by the G.T. Pacific Ry. Co. under agreement. The second provides for the payment of such sums as may be necessary to meet the difference between par and the amount at which the guaranteed bonds sold, under the Imperial Privy Council's decision on an interpretation of the meaning of the word "implement" in the supplemental agreement of 1904. The third provides for the placing of the control of construction of the Eastern Division under one commissioner instead of four, with the title of "The Commissioners of the Transcontinental Railway."

Replying to questions in the House of Commons, Mar. 4, the Minister of Railways stated that F. P. Gutelius, M. Can. Soc. C.E., and G. L. Staunton, K.C., are to receive $65 a day and reasonable expenses while engaged in investigating the National Transcontinental Railway affairs. Mr. Gutelius will be in no way connected with the C.P.R. during the period he is employed by the Government.

On Mar. 13 the Minister stated that car repair shops were being built at Winnipeg and a site was being prepared at Quebec for the National Transcontinental Ry. repair shops. To the question, "Are such repair shops intended to be for the use and benefit of the G.T. Pacific and the G.T. Ry?" he answered "Yes."

The Minister of Public Works, the Minister of Railways, the Postmaster General and representatives of the marine interests have arranged a conference to be held at an early date, with reference to the terminal facilities for the railway in Quebec. It is desired that the waterfront property at present held by the Richelieu and Ontario Navigation Co. be acquired by the Government, but up to the present the company will not entertain the proposition.

Grand Trunk Pacific Railway Construction

Main Line.—Press reports state that it is proposed to add immediately at least five miles of sidings and spur tracks at Wainwright, Alta., and that sites are being acquired for the erection of warehouses.

The company has acquired lands between Namayo and Kinistino Streets, Edmonton, Alta., for yard purposes. The yard will have 10 pairs of tracks, with three wagon roadways. Plans have been submitted to the city authorities for a freight shed 52 by 400 ft. fronting on Elizabeth St. It will be of frame covered with zinc sheeting, with a felt and gravel roof, on concrete pedestals.

E. J. Chamberlin, V.P. and G.M., is reported as stating that owing to the fact that there has been no snow in some parts of the foothills and the Yellowhead Pass, and too much in others, the work of getting in supplies for the building of the line to the Fraser River in B.C. has been hindered. There is considerable rock cutting to be done on the lines between the present rail head and the river, but it is expected to have the track laid to that point by June 1.

It is reported that the first steel bridge in British Columbia on the line from the east crossing the Fraser at mileage 29 has been completed. It is 500 ft. long and the rail level is 75 ft. above high water.

A good deal of grading has been done from Tete Jaune Cache towards Fort George, B.C. It is reported that subcontracts have been let for grading both easterly and westerly from Fort George, near which point it is expected that the last spike will be driven.

The section of the line under construction easterly from Prince Rupert, B.C., to Aldermere is well advanced to completion. Track has been laid to 18 miles from the crossing of the Skeena River below Hazleton, and it is expected that it will be laid to the river early in April. This will take the rails to 170 miles from Prince Rupert. The piers for the bridge have been completed and it is expected that the bridge will be completed early in June. Grading has been practically completed to Aldermere, and it is expected to have track laid to that point by the fall. Owing to the advanced state of construction to this point, the headquarters of C.E. Van Arsdol, Division Engineer, are to be moved further east and a camp is being prepared for the construction offices near Bulkeley Summit. Sub-contracts are reported to have been let for grading from Aldermere to Burns Lake as follows:—Aldermere easterly eight miles, Jno. Bostrom; next 10 miles, Freeburg and Stone; next four miles, D McLeod; next 17 miles, Sheedy and Smith; next 10 miles, I. Albi; ten miles west of Bulkeley Summit, D. Ross; five miles east of Bulkeley Summit, J. McLeod; next 10 miles, A. L. McHugh; next 10 miles, D. Stewart; 14 miles along Burns Lake and eastward, D. A. Rankin and Co.

Terminal Work at Prince Rupert.—Contracts are reported to have been let for the excavation work on the site of the dry dock terminals and hotel in Prince Rupert, B.C. The station is to be built on the site of the present town hall. The present hotel—the Prince Rupert Inn—is being removed to Centre St. and this site will be used for yard purposes.

G.T.P. Branch Lines.—We are officially advised that the company is not considering the building of a branch line from Napadoggan to Fredericton, N.B., 45 miles, as stated in press reports.

The construction for the current year includes the completion of the branch from Harte to Brandon, Man., 24 miles.

In connection with the guarantee of bonds of lines of the G.T.P. Branch Lines Co. in Saskatchewan the Provincial Legislature has extended the time within which such lines are to be completed to Dec. 31, 1912. Another act has been passed providing for the issue of guaranteed bonds or other securities for $13,000 a mile, under the provisions of Sec. 9, chap. 4, of the statutes of 1908-09. The securities to be guaranteed under this act are in respect to additional lines to be built under order-in-council, which are to be completed by Dec. 31, 1914. Under this legislation contracts were let in 1911 for the building of several lines, certain of which it is expected to have completed by the end of the current year. These are:—

Regina boundary branch, from Regina southeasterly, 155 miles, J. D. McArthur, contractor, Winnipeg. In connection with this line the Board of Railway Commissioners has approved revised location plans from mileage 17.02 to 91.13.

Regina to Moose Jaw, 40 miles. Rigby, Hyland and Plummer, contractors.

Moose Jaw northwesterly, 40 miles. J. D. McArthur, contractor.

Prince Albert branch, to complete from 67 miles out of Young to Prince Albert, 54.5 miles. J. D. McArthur, contractor.

Battleford branch from Oban to Battleford, 48 miles. J. D. McArthur, contractor.

Cutknife branch, from Battleford, westerly, 50 miles. J. D. McArthur, contractor.

Biggar-Calgary branch, from Biggar, Sask., southwesterly to Calgary, Alta., 104 miles. Foley Bros., Welch and Stewart, contractors. The schedule of the act passed by the Saskatchewan Legislature this year provides for the guaranteeing of bonds to be issued for this line for 50 miles, in addition to the 50 miles already built, and also provides for a guarantee of bonds for this or any other of the lines already guaranteed for further extensions not exceeding 40 miles in any case. For the section of this line in Alberta, an extension of time for construction has been granted by the Alberta Legislature.

The Grand Trunk Pacific Saskatchewan Ry. Co. has been incorporated by the Saskatchewan Legislature, with E. J. Chamberlin, G. W. Caye, W. Le B. Ross, D'Arcy Tate and H. H. Hansard, Winnipeg, as provisional directors. It is authorized to build the following railways: From tp. 9 or 10, range 13, west of the second meridian through Weyburn, thence southwesterly and westerly to the western boundary of the province in tps. 2 to 5; from tp. 16, range 19, southwesterly to a junction with the first mentioned line; from Saskatoon westerly and northwesterly to Battleford; from near Watrous southwesterly to Swift Current and thence to the International boundary between ranges 23 and 30 west of the third meridian; from Melville northerly, northwesterly and westerly to Watrous; from Saskatoon southeasterly and southerly to Regina; from tp. 36, range 8, west of the third meridian, southwesterly and westerly to a junction with the G.T.P. Branch Lines Co.'s Biggar-Calgary branch; and such other lines within the province as may be authorized from time to time by order-in-council. Another act has been passed authorizing the Government to guarantee the company's bonds up to $13,000 a mile in respect of these lines. The proceeds of the sale of the guaranteed bonds shall be paid into a special account and paid out as the work proceeds upon the certificate of the provincial Minister of Railways. Part of the mileage has to be built during the current year and all the lines have to be completed by Dec. 31, 1914. The lines referred to will total 205 miles, and the act provides that the guarantee may be added to bonds to be issued in respect of the extension of any one of them for a further distance of 40 miles.

The Alberta Legislature has extended the time for the construction of lines authorized under previous legislation, for which contracts have been entered into either with the G.T.P. Branch Lines Co. or other subsidiary companies. The lines, for which contracts were let last year, or which are included in the construction programme for the current year, are as follows:—

Tofield-Calgary branch, completion of the branch involving 95 miles of construction. J. D. McArthur, contractor.

Calgary to Lethbridge, 111 miles. Tenders are reported to be under consideration.

Alberta Coal branch, completion of branch involving 25 miles of construction. Foley Bros., Welch and Stewart, contractors.

The act passed at the Alberta Legislature's recent session also provides for the guarantee of bonds for the building of a line from an unnamed point on the G.T.P. Ry. southerly for 58 miles to open up additional coal fields.

The G.T.P. steamship dock at Vancouver, B.C., which was opened for traffic Feb. 27, is fully described in a separate article in the Marine Department on another page of this issue.

Telegraph Lines.—Particulars of construction to date and the programme for this year are given on another page.

A New York press report states that the Howe Sound and Northern Ry. has been acquired in the interests of this company, the purchase price being $375,000. The line runs from Newport northward through the Squamish River Valley for about seven miles.

RAILWAY DEVELOPMENT.

Projected Lines, Surveys, Construction, Betterments, Etc.

Ainsley Coal Co.—We are officially advised that the company's collieries are about four miles out of Medicine Hat, Alta., and that they are being developed so as to be able to produce 1,000 tons daily. The company proposes to sell coal to the city council and to manufacturers for power production at $1.50 a ton, and in return for this concession the city is to build a spur line from the C.P.R. within the city limits to the city boundary, nearest to the collieries, about three miles. The cost of the spur is estimated at $25,000. (Mar., pg. 120.)

Argenteuil Ry.—Application is being made to the Quebec Legislature to incorate a company with this title to build a railway to be operated by steam, electricity or other power from the boundary between Harrington and Grenville tps. to the canal at Grenville, Que. The provisional directors are:—C. Laurin, C. Wilson, J. A. Laurin, J. Cooper, J. G. Thompson, Montreal. (Mar., pg. 120.)

Atlantic, Quebec and Western Ry.—A meeting of the shareholders of the Quebec Oriental Ry. will be held in London, Eng., April 16, to elect directors, transact other general business and approve an agreement with the A.Q. and W. Ry. Co. for the erection of joint shops at New Carlisle, Que., and for granting the A.Q. and W. Ry. running rights over the Q.O. Ry. This latter railway is the old Atlantic and Lake Superior Ry. (Dec., 1911, pg. 1137.)

Burrard Inlet Tunnel and Bridge Co.—The plans for the proposed bridge across the Second Narrows of Burrard Inlet are being prepared in London, Eng., and are expected to be completed for submission to the Board of Railway Commissioners for approval early in May. The company has been advised that the Railways Department insists that the opening span be 250 ft. wide, consequently a double leaf, instead of a siagle leaf bascule, as originally proposed, will be provided. The bridge will be of the Warren truss type, with a total length of 1,550 ft., concrete piers and abutments. It will provide accommodation for a single steam railway track, a 39 ft. roadway for general traffic, on which will be laid a double track for electric cars, and an 8 ft. sidewalk. The approaches will be wide enough to enable double tracks to be laid for steam traffic. The estimated cost is $2,125,000.

In a report to the municipalities interested the company states that the capital stock issued is held as follows:—District of North Vancouver, $250,000; city of Vancouver, $200,000; city of North Vancouver, $100,000; Burnaby district, $50,000; the six directors, L. Bond, J. P. Fell, J. C. Keith, E. W. McLean, E. Mahon, and J. Y. McNaught, 25 shares of $100 each. The provincial Government had voted $400.000 in aid of the bridge, and the Dominion Government voted $200.000 to the Vancouver, Westminster and Yukon Ry. towards the building of a bridge. An arrangement had been made with the V.W. and Y. Ry. for the joint building of the bridge. Application had been made to the Dominion Government for an increase of the subsidy to $500,000. The bridge will be used by the Pacific Great Eastern Ry. and by other railways which may desire an entrance into North Vancouver. (Mar., pg. 120.)

Canadian Central and Labrador Ry.—Application is being made to the Dominion Parliament to incorporate a company with this title to build a railway from Winnipeg northeasterly to south of Hamilton River on the boundary of Quebec and Labrador, with branch lines to the National Transcontinental Railway at the Quebec-Ontario boundary, to Montreal; and from near James Bay, Que., to Port Nelson, on Hudson Bay. Smith and Johnston, Ottawa, are solicitors for applicants.

Central Ry. of Canada.—We are officially advised that surveys have been made for a line from St. Eustache, Que., to South Indian Jct., Ont., and the present intention of the general contractors, C. J. Wills and Sons, is to build 20 miles of line in Quebec, and 20 miles in Ontario this year. None of the work has as yet been put in the hands of subcontractors. Contracts have been placed for 100,000 ties, to be delivered by June 30, and it is expected to place orders for steel rails at an early date.

Press reports state that the company has completed, ready for submission to the Board of Railway Commissioners, plans for a station and terminals in the eastern part of Montreal; that a contract has been let for the building of the line from Montreal to Ottawa, and that the work will be started in the spring.

Chicago, Milwaukee and St. Paul Ry—W. B. Dixon, Assistant General Passenger Agent, is quoted as stating that the company is not, either directly or indirectly, purchasing land for terminal purposes in Winnipeg. The company has not, he adds, for the present, any intention of going into Winnipeg over its own line, whatever it may eventually do. (Mar., pg. 120.)

Dominion Atlantic Ry.—The Board of Railway Commissioners has approved of location plans for the projected North Mountain branch from Lakeville to Weston, N.S., 10 miles

The work for repairing, strengthening and renewing the bridges is being proceeded with. The work is being done under the superintendence of —. Ripley, a C.P.R. engineer. (Mar., pg. 120.)

Edmonton, Dunvegan and British Columbia Ry.—The legislation guaranteeing bonds for $20,000 a mile for a line from Edmonton to Dunvegan, Alta., 350 miles, has been passed by the Alberta Legislature. Other acts giving the company powers to enter into agreements and confirming an agreement with the G.T.P. Ry. in respect of the interchange of traffic were also passed. In an interview at Edmonton, Mar. 11, the Premier said construction work will be pushed forward with all speed, and it is expected that steel will be laid on the section from Edmonton to the Athabasca River, 100 miles, this year. The Board of Railway Commissioners has approved of location plans for the route for the first 30 miles, through tps. 53 to 56, ranges 24 to 26, west of the 4th meridian. (Mar., pg. 120.)

Elkhorn Northern Ry.—The Manitoba Legislature is being asked to extend the time within which the line from Elkhorn northerly, authorized to be built by chap. 92 of the statutes of 1910, may be built. (Dec., 1910, pg. 1013.)

Esquimalt and Nanaimo Ry. — The British Columbia Legislature has confirmed an agreement made between the Government, the E. and N. Ry,. and the C.P.R., dated Feb. 17, which sets forth that the company desires to lease its line to the C.P.R., and the Government declares that such lease shall not affect the exemption from taxation of the company's lands. In consideration of this the company agrees to pay on June 30 annually, 1½ cents an acre in respect of such of the lands mentioned in sec. 3, chap. 14, 47 Vict., as shall remain vested in the company, and therefore exempt from taxation; and shall by Dec. 31, 1915, build an extension of its line from the present northerly terminus to Courtenay. (Mar., pg. 120.)

Fredericton and Grand Lake Coal and Ry. Co.—We were officially advised recently that no contract has been let for the building of this projected railway, from Minto to Fredericton, N.B.

Later press reports state that a contract for building the first section of this projected railway has been let to A. E. Trites, of Salisbury, N.B., and that work will be started at once.

Reference was made to the projected building of the line in the speech from the throne at the opening of the N.B. Legislature, Mar. 7, and it was also intimated that legislation would be introduced providing for the leasing of the railway when built to the C.P.R., and also for the operation by the same company of the New Brunswick Coal and Ry. Co.'s line, now operated by a provincial Government commission. This line runs from Norton on the Intercolonial Ry. to the coalfields at Minto, and the projected F. and G.L.C. and Ry. Co.'s line will run from Minto to Gibson, where it will connect with the C.P.R. line. (Feb., pg. 67.)

Hudson Bay and Pacific Ry.—Press reports from Prince Albert, Sask., Mar. 10, state it is anticipated that an early start will be made with the building of this line from Prince Albert to Fort Churchill. The report adds that a construction company has been organized in London, Eng., to build the line, and that the contract for the building of terminal wharves, etc., on Hudson Bay, has been let to Pethick Bros., Plymouth, Eng. (June, 1911, pg. 505.)

Intercolonial Ry.—The speech from the throne at the opening of the Nova Scotia Legislature said the Federal Government had assumed the responsibility of providing branch railways in the Halifax, Guysboro and Victoria counties, and that financial provision had been made by Parliament for their construction.

It is reported from Ottawa that plans are being matured for the development of the line, and that they will take a definite shape after the adjournment of Parliament. One of the propositions under consideration is said to be for a general reduction of gradients on the whole line, and the other involves the building of a second track from Moncton to Halifax.

Press reports state that M. P. and J. T. Davis have sublet a portion of the contract for the building of a line from Dartmouth to Dean's Settlements, N.S., to Cavicchi and Pagano, Halifax. (Mar., pg. 120.)

Kaslo and Slocan Ry.—We are officially advised that this railway has been transferred to the British Columbia Government, and is being turned over under an agreement to the C.P.R. The line extends from Kaslo to Sandon, B.C., 28 miles, connecting at Sandon with the Nakusp and Slocan Ry., operated under lease from the B.C. Government by the C.P.R. The line is to be standardized, and the work is to be completed by Dec. 31, 1913. (Mar., pg. 121.)

Kettle Valley Lines.—The British Columbia Legislature has confirmed an agreement between the provincial Government and the Kettle Valley Ry., under which the province agrees to subsidize a railway from the Coldwater River, about 25 miles south of Merritt, to the north bank of the Fraser River, near Hope, at the rate of $10,000 a mile; and to pay $200,000 towards the construction of a steel bridge for railway and general traffic across the Fraser River at Hope. It is specified that the route shall be via the Coldwater and Coquihalla river valleys, and that the line to be subsidized shall not exceed 50 miles. Construction of the line and bridge is to be started by July 1, and the whole work is to be completed by July 1, 1915. A further provision stipulates that the subsidies are not to be paid until the company provides for the building of a line

from Hope to New Westminster and Vancouver, or has entered into a contract with some railway running into these two cities for the running of through freight and passenger trains from all points on the K.V. Ry. to and from New Westminster and Vancouver.

In connection with the building of the line mentioned above, it is reported that the location plans approved by the Government show a line starting at mileage 25 on the line completed south from Merritt in the Nicola Valley, and extending 10 miles up the Coldwater Valley to the summit, on a maximum gradient of 1%. West of the summit the location follows the Coquihalla River for 35 miles to the Fraser River. The maximum gradient on this section is 2.2% against eastbound traffic. Construction will be heavy on both sides of the summit, as there will be much rock cutting and several tunnels. At the Fraser River a bridge is to be built which will give connection with the C.P.R.

On the main line between Midway and Merritt, 260 miles, grading has been completed on 85 miles, and steel has been laid on 65 miles. A considerable amount of grading has been done at other points, and is being pushed forward as rapidly as the heavy character of the work will permit. It is expected to have the line completed through from Midway to Merritt by the end of 1913.

The B.C. Legislature has ratified a bylaw of the municipality of Penticton, granting aid to the company in connection with its construction in the town.

Camson, Shindahl and Co. have a subcontract for a five mile section of the line westerly from Penticton.

The Board of Railway Commissioners has approved location plans from mileage 28 to 52 from Hope, B.C. (Mar., pg. 121.)

Lindsay and Minden Ry.—The provisional directors named in the application to the Ontario Legislature for the incorporation of a company with this title are: J. H. Delamere, M. Brown, J. J. Mortimer, Minden, Ont.; J. W. Wood, Lindsay, Ont.; S. F. Stinson, J. M. Delamere, Toronto. It is proposed to build a steam or electric line from Lindsay to Mountain Lake, and to operate vessels on Mountain Lake. (Mar., pg. 121.)

Michigan Central Rd.—The Board of Railway Commissioners has authorized the operation of trains across the new drawbridge over the Welland canal, just east of Welland station, Ont. (Feb., pg. 68.)

Midland Terminal Ry.—The Ontario Legislature is being asked to extend the time within which the lines authorized to be built by sec. 2, chap. 105 of the statutes of 1903 may be built, and to authorize the building of a line from the waterfront at Midland, south and southeasterly, to a junction with the G.T.R. at Coldwater, Ont. T. Gibson, Midland, Ont., is solicitor for applicants.

Moncton and Buctouche Ry.—We are officially advised that the press reports as to a proposed car ferry between Richibucto, N.B., and Prince Edward Island, are rather premature in so far as the construction of the extension of the line from Richibucto to Richibucto Head is concerned, as the extension proposed is contingent on the route which will be adopted by the Dominion Government for the operation of a car ferry between the Island and the mainland. It is claimed that the water route between Richibucto Head, N.B., and West Point, P.E.I., is more free from ice, and the most feasible and practicable route on which a ferry service could be operated daily during the winter, and it is said that this route may be selected by the Dominion Government. In that event of the construction of the proposed extension to Richibucto Head, 17 miles, will be proceeded with; wharves will be built on both sides of the straits, and a standard gauge line built to connect with the Prince Edward Island Ry., either at Coleman or O'Leary's. E. G. Evans, Hampton, N.B., under whose supervision soundings and surveys have been made in the vicinity of Richibucto Head, will be the engineer in charge of the work, if construction is gone on with.

We are inclined to the opinion that any railway construction which will be undertaken on Prince Edward Island will be by the Dominion Government, and there appears to be no doubt that the car ferry service will be established and operated by the Government Railways system. (Mar., pg. 121.)

Montreal Central Terminal Ry.—The Railway Committee of the House of Commons, was informed Mar. 7, that the company's application for an act amending its powers would not be further proceeded with. (Dec., 1911, pg. 1139.)

Montreal Transcontinental Ry. — The Dominion Parliament has under consideration a bill providing for the incorporation of a company with this title, to build a railway from Montreal northerly or northwesterly to connect with the National Transcontinental Railway near Grand Lake Victoria, or at any other point in the vicinity of Migiskin River, Que., and thence to Hannah Bay, in James Bay, Ont. The provisional directors are: J. A. Vaillancourt, J. E. Vanier, T. Bastien, E. Gobier, G. E. Drummond, F. L. Wanklyn, N. Curry, Montreal; F. V. Vanier, C. E. Laflamme, R. Deschambault, St. Jerome, Que.

Nerepis and Long Island Ry.—The New Brunswick Legislature is being asked to incorporate a company with this title to build a line from the C.P.R. near Welsford to a connection with the St. John River Valley Ry. between Hampstead and Gagetown. Press reports state that a route with a gradient not exceeding 1% has been surveyed, and that in addition to tapping a rich agricultural country, some iron ore deposits at Koot Hill will be opened up.

New Brunswick Coal and Ry. Co.—See Frederick and Grand Lake Coal and Ry. Co. (Sept., 1911, pg. 855.)

North Shore Ry.—Press reports state that H. J. Von Hagen is endeavoring to arrange for the extension of the line now terminating at Adamsville, N.B., to Snowshoe Lake, on the National Transcontinental Railway. He is quoted as having stated at Beersville, that consideration was being given to a proposal to extend the line from Beersville to Chebucto Head. (Sept., 1908, pg. 618.)

Pacific and Peace River Ry.—It is reported from Edmonton, Alta., that the Pacific and Peace River Railway Development Co. is being organized in France, with a capital of $5,000,000, to build this projected railway. The P. and P.R. Ry. Co. is authorized to build a line of 480 miles from Bella Coola, on the Pacific coast, through the Pine River Pass to Dunvegan, Alta. (Jan., pg. 23.)

Prince Edward and Hastings County Ry.—Application is being made to the Dominion Parliament to incorporate a company with this title to build a railway from Trenton, Ont., to Gardenville, to Belleville, to Frankfort, and back to Trenton, with branch lines to Picton, Ferry Point, West Point, Black River, and Indian Point. The provisional directors are: G. M. Farrington, T. Walmsley, Picton, Ont.; W. H. Gough, Bloomfield, Ont.; W. P. Niles, Wellington, Ont.; H. Dempsey, Albury, Ont.

Prince Edward Island Ry.—It is reported that two routes for the proposed carferry service are under consideration, one between Cape West Point and Richibucto, N.B., referred to elsewhere in this department, under the heading of Moncton and Buctouche Ry., and the other between Cape Traverse and Cape Tormentine. Other routes were suggested but it is said none of them offered the same freedom from ice as the two referred to. (Mar., pg. 121.)

Quebec and Saguenay Ry.—The Quebec Legislature has extended the time for the building of this projected railway, and authorized it to amalgamate, if, so desired, with the Quebec Eastern Ry. (Mar., pg. 121.)

Quebec Eastern Ry.—We are officially advised that this company's charter, together with the line of the Lotbinere and Megantic Ry., which it is proposed to incorporate as a part of the projected through line from Sherbrooke to Quebec, has been acquired by Sir Rodolph Forget and J. N. Greenshields of Montreal, who represent the controlling force in the Quebec Railway, Light, Heat and Power Co. and its subsidiary, the Quebec and Saguenay Ry. The sale covers the railway 30 miles long, with rolling stock and all other equipment. The new owners have engineers in the field locating the route to connect up the present Lotbiniere and Megantic Ry., with Sherbrooke on the one hand and Quebec on the other. (Dec., 1911, pg. 1139.)

Reid Newfoundland Ry.—At the opening of the Newfoundland Legislature recently the speech from the throne referred to the opening of the Bonavista branch line, the partial construction of two others, which it is hoped will be completed by the end of this year, and the expectation that work on the other three branches provided for in the construction programme of 1910 will be started early in 1913. (Mar., pg. 121.)

St. John and Quebec Ry.—The speech from the throne at the opening of the New Brunswick Legislature, Mar. 7, referred to the signing of a contract Dec. 12, 1911, with the St. J. and Q. Ry. Co. for the building of the railway along the St. John River valley. The contract calls for the completion of the portion of the line between Centreville and Gagetown by Nov. 1, 1913, and for the completion of the whole line by Nov., 1915. An agreement to lease and operate the railway has been entered into with the Dominion Government, which will be presented for ratification. The Dominion Government agrees to guarantee the bonds for the erection of three large steel bridges on the line, and will pay the provincial Government 40% of the gross earnings of the line during the first 15 years of its operation.

Negotiations are reported to be practically concluded with the Woodstock town council for the location of divisional terminals there. The town will purchase the trotting park and the land used by the Agricultural Society as a site for the terminals and car shops, etc., which it is hoped will also be established. The town council is seeking legislation necessary to acquire the land. (Mar., pg. 121.)

Saskatoon Transfer Ry.—The Saskatchewan Legislature has incorporated a company with this title to build a line to connect up the various lines of railway centering in Saskatoon. It is proposed that the lines to be built shall be operated by either steam or electricity, or both. C. J. Alexander, Saskatoon, is one of the promoters.

South East Kootenay Ry.—The British Columbia Legislature has extended the time within which this projected line may be built. (Jan., pg. 23.)

Southampton Ry.—Press reports state that a line is well advanced in construction between Millville and Temperance Hill, N.B., 6.5 miles, and that an additional six miles is to be built to carry the line to the Southampton end of the Pokiok bridge. Some track is reported to have been laid, and it is stated that arrangements are being made for the operation of the line by the C.P.R. J. K. Pinder, M.P.P., is president of the

company. Millville is a station on the C.P.R. Fredericton-Edmundston line, and Southampton is on the St. John River.

Since the preceding paragraph was put into type, we have been officially advised that the line has been completed for 6.5 miles from the junction with the C.P.R., about one mile east of Millville. It is intended that it be operated by the C.P.R., but it is probable that it will be some time before it is opened for traffic, as it has not been approved by the Board of Railway Commissioners.

Temiskaming and Northern Ontario Ry.—In connection with the rearrangement of the boundaries of Ontario and Manitoba, on the shores of Hudson Bay, it has been arranged that a strip of territory five miles wide from the new boundary of Ontario to Port Nelson is granted to Ontario for the purpose of building an extension of the T. and N.O. Ry., from the present terminus at Cochrane, and that for terminal purposes at Port Nelson, a frontage of 10 miles on Hudson Bay and Nelson River, with a depth of half a mile, and including the river bed. etc., is set apart in the area granted to Manitoba. If the terminus of the Hudson Bay railway is fixed at Fort Churchill, provision is made for the granting to Ontario of a right of way 200 ft. wide, so that the T. and N.O. Ry. may be connected with it, and the Dominion Government agrees to grant running rights over the Hudson Bay Ry. The five mile wide strip, while remaining territorially with Manitoba is to be made free of taxation.

A contract for the complete construction (other than steel bridges) of the branch from Earlton to Elk Lake, about 30 miles, ready for the ties and rails, has been let to McCaffery and McQuiggen, Toronto, the work to be completed by Sept. 1. It is reported that track will be laid this year. The maximum gradient will be 6-10ths of 1%. McCaffery and McQuigge's contract will probably amount to about $200,000.

Toronto, Hamilton and Buffalo Ry.—Press reports from Hamilton, Ont., state that plans are being prepared for a rearrangement of the company's entrance into that city. The proposition, it is said, includes the widening of the tunnel 250 ft. to the north from the western limits to McNab St., to divert the tracks south at McNab St., crossing James St. midway between Hunter St. and Augusta St., and joining the present right of way at Ferguson Ave. The tracks are to be depressed from the mouth of the tunnel to Ferguson Ave. A new station, it is stated, will be built on the site of the present one, and carried south across Hunter St. and the depressed tracks. (Mar., pg. 122.)

Union Pacific Ry.—T. C. Shotwell, in a recent article, states that the port of Vancouver is the key to the Pacific west situation. The U.P. Rd. through one of its subsidiary lines is said to be planning to reach that port, and he adds that in order to obtain outbound cargoes for its steamships will be compelled to extend its lines from Vancouver through the Yellowhead Pass into the Peace River district.

Winnipegosis and Northern Ry.—Application is being made to the Manitoba Legislature to incorporate a company with this title to build a railway from the Porcupine Mountains district, near Steep Rock River, to Dawson Bay, on the west shore of Lake Winnipegosis, and crossing the Canadian Northern Ry. near Mafeking station. Macdonald, Haggart, Sullivan and Tarr, Winnipeg, are solicitors for the applicants, and McGregor and Young of Winnipeg are among the provisional directors.

D. W. Campbell, local manager, Elder Dempster Co., returned to Montreal, Mar. 2, from England.

Grand Trunk Railway Betterments, Construction Etc.

Southern New England Ry.—Articles of incorporation of the S.N.E. Ry. Co. have been filed in New Hampshire, the company being authorized to build from Lebanon to Concord and along the Merrimac River to the New Hampshire-Massachusetts state line. The section of the line in Massachusetts has already been approved by the State Railway Commissioners. E. H. Fitzhugh, President, submitted the plans to the legislative committee on railroads at Boston, Mass., Mar. 6, and stated that the roadbed would be prepared for a double track line, but it was only proposed to lay a single track at present. It was also proposed to build a belt line to connect the proposed sections of the line north and south of Boston and to reach the necessary terminals and docks.

The company is reported to have let a contract for the erection of 57 steel bridges on the line in Massachusetts and Rhode Island. The principal bridges will be a 1,250 ft. viaduct at Monson, Mass.; a 570 ft. bridge, 120 ft. high, at Palmer, Mass.; and a 480 ft. viaduct 60 ft. high at Melville Heights.

Bridge at Portland, Me.—A new bridge at the entrance to the company's terminals at Portland, Me., is being built. It is a 225 ft. drawbridge on concrete piers.

Lachine Canal Swing Bridge.—The Board of Railway Commissioners has authorized the rebuilding of the company's swing bridge across the Lachine canal at Montreal.

Montreal Track Elevation.—The Board of Railway Commissioners has decided in connection with the plans for the elevation of the G.T.R. tracks in Montreal, that none of the existing streets from the western limits of the city to Bonaventure station can be closed unless with the city's consent. The question of whether the tracks shall be supported by a viaduct with stone or concrete walls, or by a sloping embankment was discussed. The whole of the plans will be taken into consideration by the Commissioners. The question of the apportionment of the cost is to be dealt with later. The total cost of the work is estimated at $8,800,000, towards which the city has offered to pay $2,000,000, but the company asks that the city also pay 50% of the consequential damages.

West Toronto-Weston Second Track.—We are officially advised that it has not been definitely decided that a second track is to be built between West Toronto and Weston, on the Toronto-Port Huron line during this year.

Humber River Bridge.—The erection of the new four track bridge over the Humber River, near Toronto, is being gone on with. This forms part of the grade revision work in progress between Parkdale and Mimico.

Burlington Bay.—Press reports state that the company is acquiring water front lots on Burlington Bay, in the vicinity of Hamilton, Ont., on which to erect a large grain elevator.

Hamilton Yards, Etc.—Vice President Kelley, Superintendent Gillen and the company's engineer recently spent some time in Hamilton and vicinity inspecting the company's property, and it is reported that arrangements are being made to lay out a large new yard in the vicinity of Stony Creek to relieve the congestion in the Hamilton yards.

D. E. Galloway, Assistant to the President, is reported as having said, Mar. 13, that fruit sheds might be erected at Stoney Creek, Ont., but that there was no truth in the report that the work now done at the Ferguson Ave. yards, Hamilton, was to be transferred to yards to be laid out at Stoney Creek.

Holmedale Switch, Brantford.—The Board of Railway Commissioners has authorized the G.T.R. to build a branch line through the Holmedale district, Brantford, Ont., across the hydraulic canal and the Grand River to its Brantford and Tillsonburg branch, and to close certain streets. This order carries out the terms of an agreement with the city council made some time ago.

Automatic Block Signalling.—It is reported that orders are being placed for the installation of automatic block signals on the line between Toronto and Niagara Falls, and from Hamilton to Lynden, Ont.

Plans are now being made to instal an automatic block signalling system between Toronto and Niagara Falls, and also between Hamilton and Lynden Jct., where the main lines diverge to Harrisburg and Brantford. The G.T.R. is also planning to instal this system on the 26th district in Indiana.

London, Ont., Improvements.—Local officials state that there is no probability of any improvements being made at London, Ont., this year. The mayor stated, Mar. 6, that while he had not received any information from Montreal he understood that plans were being prepared for very important changes, and that part of the work would be put in hand within a reasonable time.

Bay City, Mich.—A contract is reported to have been let for the erection of a bridge across the river at Bay City, Mich., to bring the G.T.R. more into the centre of the city than it is at present. The plans show a structure of five spans, of 150 ft. each, and two draw spans of 250 ft. each, resting on concrete piers and abutments. (Mar., pg. 138.)

Great Northern Railway Lines in Canada.

Vancouver, Victoria and Eastern Ry. and Navigation Co.—The Board of Railway Commissioners has authorized the opening for traffic of the extension of the line from Princeton to Coalmount, B.C., 13 miles. The plans for the extension of the line from Princeton to near Merritt are reported to be practically complete, and press reports state it is expected that construction will be gone on with during this year. It is said that for the present the company will not build an independent line from near Merritt to Hope, but will make an arrangement with the Kettle Valley Ry. to operate over the line it is to build between these points under the new contract with the British Columbia Government, and will then make connection with the Canadian Northern Pacific Ry. and run over that company's line to near Chilliwack, where it will run over its own line into New Westminster, Vancouver and the United States.

Vancouver Terminals.—Contracts are under consideration for the moving of about 100,000 cubic yards of earth near Grove Crescent. This is the first piece of work to be undertaken on False Creek. The entire work of reclamation and construction will require the moving of between 3,000,000 and 4,000,000 cubic yards of material. Part of the material required for the filling will be taken from the cuts, but large quantities will have to be brought from elsewhere. When the terminal construction is completed it is probable that the Northern Pacific Ry. will be given running rights into the city.

Rapid progress is being made with the construction of the new pier, near the B.C. Sugar Refinery, and it is expected to have it ready this year. Clarke and Co., Seattle, are the contractors. (Mar., pg. 122.)

New Railway Subsidies by Dominion Government.

The Minister of Railways moved resolutions in the House of Commons, Mar. 21, granting aid for the construction of railways. The first resolution provides for the aiding of the Temiskaming and Northern Ontario Ry., out of the Consolidated Revenue Fund, under such conditions as the Governor-in-council deems expedient, not exceeding $6,400 a mile, in respect of the following lines:—From North Bay to Cochrane, not exceeding 252.8 miles; Englehart to Charlton, 7.8 miles; Cobalt to Kerr Lake, 3.9 miles; Iroquois Falls to Timmins, 33.16 miles; Nipissing Jct. to North Bay, 2.18 miles.

The second resolution provides for the granting of aid for the construction of the following lines, at $3,200 a mile- increasing to $6,400 in proportion to the cost in excess of $15,000 a mile:—

NOVA SCOTIA.

From Liverpool, via Milton to Caledonia, N.S., not exceeding 30 miles. (Renewal of subsidy granted in 1907.)

Great Northern Mining and Ry. Co.—From Little River to Eastern Harbor, not exceeding three miles.

NEW BRUNSWICK.

From St. John to Grand Falls, exclusive of a bridge across the Kennebecasis River at Perry Point, and two across the St. John River at Mistake and Andover respectively, not exceeding 228 miles. (Renewal of subsidy granted in 1910.)

From Albert Mines to Moncton, not exceeding 22 miles.

Fredericton and Grand Lake Coal and Ry. Co.—From near Gibson to Minto, with a branch line to Marysville, not exceeding 35 miles.

Southampton Ry.—From Millville to Pokiok Bridge on the St. John River, not exceeding 13 miles.

Northern New Brunswick and Seaboard Ry.—From Austin Brook to the Intercolonial Ry., and thence to Bathurst harbor, not exceeding 26 miles.

North Shore Ry.—From Adamsville to the National Transcontinental Railway, not exceeding 20 miles; from Beersville to Richibucto Head, not exceeding 20 miles.

QUEBEC.

From St. Agathe des Montes towards Howard tp., not exceeding 15 miles. (Revote of subsidy granted in 1908.)

From Montreal to mileage 837 west of Moncton, on the National Transcontinental Ry., not exceeding 200 miles. (In lieu of subsidy voted in 1910.)

From mileage 837 National Transcontinental Railway, west of Moncton, to the mouth of Nottaway River, not exceeding 300 miles.

L'Avenir and Melbourne Ry.—From Melbourne to Drummondville, not exceeding 23 miles. (Renewal of subsidy granted in 1910.)

Ha Ha Bay Ry.—From St. Mathias to Ha Ha Bay, not exceeding 20 miles; from Labrosse Jct. to the Saguenau River, not exceeding five miles; from La Terrieri Jct. northerly to Lake Kenogami, not exceeding 12 miles; from near Bagotville to St. Alexis, not exceeding three miles. (In lieu of a 40 mile subsidy granted in 1910.)

Interprovincial and James Bay Ry.—From near Temiskaming to the Des Quinge River, not exceeding 50 miles. (Renewal of subsidy voted in 1906.)

Canadian Northern Quebec Ry.—From near Arundel to Preston and Hartwell tps., not exceeding 30 miles. (Renewal of subsidy voted in 1910.)

Quebec and Saguenay Ry.—From St. Joachim northeasterly, not exceeding 62.8 miles; from mileage 62.8 from St. Joachim towards Seven Islands, 107.2 miles. (In lieu of subsidies for 170 miles voted in 1910.)

Quebec Central Ry.—From St. George to St. Sabine, 1.34 miles; from St. Sabine (mileage 31.34 from St. George), to Dionne tp., not exceeding 50 miles.

Canada and Gulf Terminal Ry.—From Matane easterly to Gaspe Basin, not exceeding 200 miles.

Grand Lake and Bell River Ry.—From Bell River to Rabbit Lake, Pontiac county, not exceeding 45 miles.

St. Charles and Huron River Ry.—From Indian Lorette to Stoneham, not exceeding 7.5 miles.

ONTARIO.

Algoma Central and Hudson Bay Ry.—From Sault Ste. Marie to between White and Dalton stations on the C.P.R., not exceeding 200 miles; from Michipicoten Harbor towards the C.P.R., not exceeding 25 miles; from the C.P.R. towards the National Transcontinental Ry., not exceeding 50 miles. (In lieu of subsidies voted for 270 miles voted in 1910.) From the end of the 50 miles last mentioned to the National Transcontinental Ry., not exceeding 65 miles.

Algoma Eastern Ry.—From the Sudbury-Little Current line westerly towards the Algoma Central and Hudson Bay Ry., not exceeding 76 miles; from Sudbury northerly, not exceeding 30 miles. (In lieu of subsidy for 106 miles voted in 1910.)

Tillsonburg, Lake Erie and Pacific Ry.—From Ingersoll to Stratford, or to between Berlin and Stratford, not exceeding 35 miles. (Revote of subsidy granted in 1907.)

Lac Seul, Rat Portage and Keewatin Ry.—From Kenora to the National Transcontinental Ry., not exceeding 22 miles. (Revote of subsidy voted in 1910.)

Toronto, Lindsay and Pembroke Ry.—From Golden Lake to Bancroft, not exceeding 51 miles. (Revote of subsidy granted 1910.)

Simcoe, Grey and Bruce Ry.—From Orillia towards Kincardine, not exceeding 50 miles.

Rainy River Radial Ry.—From Fort Frances to the mouth of Little Grassey River, not exceeding 50 miles.

Lake Erie and Northern Ry.—From Galt to Port Dover, not exceeding 58 miles; from Paris to Ayr, not exceeding 10 miles.

Bruce Mines and Algoma Ry.—From Rock Lake Mine towards the C.P.R. Transcontinental line, not exceeding 50 miles.

MANITOBA

Canadian Pacific Ry.—From Teulon to Icelandic River, not exceeding 35 miles. (Revote of subsidy granted in 1906.)

Manitoba and North Western Ry.—From Hamiota to Birtle, not exceeding 30 miles.

Grand Trunk Pacific Ry.—From Harte to Brandon, not exceeding 25 miles.

ALBERTA.

Alberta Pacific Ry.—From Cardston towards Calgary, not exceeding 100 miles.

Calgary and Fernie Ry.—From Calgary, Alta., to Fernie, B.C., not exceeding 100 miles.

BRITISH COLUMBIA.

Vancouver, Westminster and Yukon Ry.—From Vancouver via Second Narrows of Burrard Inlet, northerly for 100 miles. (In lieu of subsidy voted in 1908.)

Kootenay Central Ry.—From Golden via Windermere and Fort Steele to Jukeson, not exceeding 175 miles; from near Caithness to the International boundary, not exceeding 25 miles. (In lieu of a 200 subsidy voted in 1910.)

Kettle Valley Ry.—From Grand Forks for 50 miles along the North Fork of Kettle River. (Revote of subsidy voted in 1908.) From Penticton to the International boundary, not exceeding 50 miles.

Esquimalt and Nanaimo Ry.—From Wellington to Alberni, not exceeding 60 miles; from McBride Jct. to Sandwich, not exceeding 45 miles; from Sandwich to Campbell River, not exceeding 38 miles. (In lieu of subsidy for 143 miles voted in 1907.)

Burrard Inlet Tunnel and Bridge Co.—From Eburne to mouth of Seymour Creek, not exceeding 10 miles; from Seymour Creek to Deep Cove, not exceeding five miles; from Seymour Creek to Horse Shoe Bay, not exceeding 14 miles; from Pender St., Vancouver, to North Vancouver, not exceeding three miles.

Caribou, Barkerville and Willow River Ry.—From Eagle Lake to Barkerville, not exceeding 87 miles.

Naas and Skeena Rivers Ry.—From Nasoga Gulf towards the Skeena River, near Groundhog Mountain, not exceeding 100 miles.

From near Campbell River, on the Esquimalt and Nanaimo Ry., towards Fort George, on the G.T. Pacific Ry., not exceeding 100 miles. (In lieu of subsidy voted in 1908.)

Another resolution provides for the granting of a subsidy of $12,000 a mile to the Canadian Northern Pacific Ry. for building a railway from the Yellowhead Pass to Vancouver and the mouth of the Fraser River, 525 miles.

The Governor-in-Council is, under the resolution, authorized to grant aid towards the construction of bridges as follows:—

VANCOUVER, WESTMINSTER AND YUKON Ry.—Towards erection and completion of railway bridge across Burrard Inlet, $350,000. (In lieu of subsidy voted in 1908.)

KETTLE VALLEY RY.—Towards erection and completion of railway bridge across Fraser River at Hope, B.C., not exceeding $250,000.

CARIBOU, BARKERVILLE AND WILLOW River Ry.—Towards erection of 20 railway bridges, 25% of the total amount expended, not exceeding $95,000.

CANADIAN PACIFIC RY.—Towards erection of bridge across the Saskatchewan River at Outlook, Sask., 15% of cost, not to exceed $115,000. As lessees of Calgary and Edmonton Ry., 15% of cost of construction of bridge across Saskatchewan River, connecting Strathcona and Edmonton, Alta., not exceeding $126,000.

GRAND TRUNK PACIFIC RY.—Towards erection of bridge across Assiniboine River at Brandon, Man., 15% of cost, not to exceed $20,000.

A further resolution provides for guaranteeing the bonds of a bridge company for $1,000,000, and interest on the same for the following bridges on the line along the St. John River Valley, proposed to be built by the St. John and Quebec Ry. under contract between the Dominion and New Brunswick Governments, and to be operated under lease by the Intercolonial Ry., viz., across the St. John River at Andover; across the St. John River at Mistake, and across the Kennebecasis River at Perry Point, all in New Brunswick.

Railway Lands Patented.—Letters patent were issued during Jan. in respect of railway lands in Manitoba, Saskatchewan, Alberta and British Columbia, as follows:—

	Acres.
Calgary and Edmonton Ry.	6.14
Canadian Pacific Ry.	1,684.62
Grand Trunk Pacific Ry.	206.61
Qu'Appelle, Long Lake and Saskatchewan Rd. and Steamboat Co.	959.00
Total	2,856.37

The Quebec Bridge Wreck.—The recent attempt to revive the discussion of the cause of the Quebec bridge wreck by ascribing it to dynamiters is altogether foolish and without any foundation of fact. The bridge fell because its details were improperly designed. The web plates of which the bottom compression member was composed were insufficiently latticed together and the latticing tore asunder, permitting the posts to crumple up under a load less than it was intended to carry, and drop the whole bridge into the river.

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Reclaiming of Scrap Material at Railway Shops.

By E. J. McVeigh, Storekeeper, G.T.R., Ottawa.

This matter has come to the front lately stronger than ever before, and is being very carefully considered by railway officials, and the more they consider it, the less simple it appears. Some roads claim to have done wonderful things along this line, but we should be slow to accept their statements at their face value without proof.

In attempting to deal with the question of reclaiming scrap material at our railway works, we are confronted with so many conflicting elements, that we almost despair of laying down rules that, followed out, would be of general benefit. But one thing we must carefully avoid, and that is, not to be carried away by our enthusiasm, either in theory or practice. We may very easily waste, or lose, more than we save by going at a thing of this kind blindly..

Then in laying down general rules, or giving our own experience as an object lesson, we must keep in mind the fact that what might be good policy for one road might be the reverse for another, and that local conditions govern to an extent here, as in so many other matters in connection with our railways.

For instance, a small railway buying all of its metals in the open market, and selling all of its scrap in like manner, might, with advantage, go further in reclaiming scrap than could a large system operating its own rolling mills, grey casting foundries, brass foundry, etc., etc. The reason will be plain enough. The small road pays an average price of $2.15 per 100 lbs. for its wrought iron. It sells its no. 1 wrought scrap for 50 cents per 100 lbs., difference $1.65 per 100 lbs. The large system turns out from its own mills, wrought iron at $1.35 per 100 lbs., turning in no. 1 wrought scrap at 50 cents; difference 75 cents. This leaves 90 cents per 100 lbs. that the small road might spend to advantage in reclaiming scrap, over and above what the larger system could do. The same thing holds good with cast and brass scrap, to a greater or less extent. The figures used are merely by way of illustration.

But there are other elements beside apparent cash value to be considered. We know that iron and steel deteriorate with age and use, and we must be very careful in selecting a piece of scrap to use in replacing a locomotive part. It would be poor economy, indeed, to save 50 cents worth of new material, and cause an engine failure by so doing. Nor could we feel much satisfaction in saving a few cents by cutting and re-threading a few old car bolts, and have a set of draught timber pull out, because there was no life in the old bolts, and they broke. The re-setting of old coupler springs does not seem to cost much, but do we get good service from them afterward? It may seem that the answer to this would be that it depended on the skill of the man who reset them; but this is not always the case by any means. The age of the steel in the spring has much to do with it, and here again we must, or should, select with care the material we will spend money on in reclaiming, rather than buy new. It is very easy to make mistakes in this matter, and quite frequently, when we think we are accomplishing most, is when we may be wasting money instead of saving it.

Some years ago it occurred to me, that we might effect a considerable saving by reclaiming a portion of the plucked air brake hose. I found that hose pulled apart, broke close to the nipple end, leaving the greater portion apparently as good as new. Two of these cut to proper length and joined with a small malleable coupling, would give us a new hose. The saving would be—one new hose, $1.10, less coupling, clamps and labor, 18 cents, net saving 92 cents. This repeated fifty to one hundred times a day looked very good, and as a matter of fact many of our railways were soon following this practice, and you could see hose so "reclaimed" in every railway yard in America. You do not see so many today. Why? Because I found, and no doubt others did also, that a hose pulled apart, while it might look good, was, in fact, worthless, the stretching having destroyed it, and instead of saving money we had been wasting it.

Another example, I found at one time that the track cold sets turned out of the shops were useless, a dozen of them would not cut one rail. The trouble was that a smart foreman had conceived the idea of using scrap steel tires in making up these sets, and he was tickled all over at the thought of how much new steel he was saving, while, as a matter of fact, he was wasting 75 cents on each cold set he turned out. "A little knowledge is a dangerous thing," and nowhere more so than in the reclaiming of scrap.

Then if we are going to save our scrap on the chance that it may be useful, how far are we to go with it? Will we rescue from the scrap bin each day, or each week, only such material as we know can be at once turned back into use, or shall we save all that we think may by any chance be found useful some day? If we follow the latter plan how long would we be accumulating a mass of material representing a sum of money, the interest of which would more than balance any small saving we might effect by the use of the small portion we found use for, and what about the extra room required, and the labor expended?

In this age of rapid change and advance in railway equipment, one of the problems we face is the rapid accumulation of obsolete material, and scrap, and nice judgment is often required in dealing with it. Naturally, we want to keep it down in quantity for appearance sake, and we want to get out of it as early as possible, all that it is worth in cash. On the other hand, we know that some of this material may be found of use some time, but what portion of it? It is the old problem of the fellow who made up his mind he would believe one-half that his friend told him, then he was confronted with the question of which half, and there he stuck. Personally, after many years wrestling with the problem, and making some hits and some misses, I have come to the conclusion that about as good a plan to follow as any is this: Let each shop, car and locomotive, collect its scrap in set of scrap bins, as close to shop as possible. Allow your men free access to these bins, and encourage them to use from them each day as far as advisable. Dispose of scrap by sale not less than four times in the year, and when loading, hold out only such pieces as you think may be used at once, and let remainder go. If what you have thrown back at one loading is found still on hand at the next, send it away, and repeat the process.

[Mr. McVeigh's paper opens up a very interesting and important question. We would be glad to hear from any of our readers in regard to it and to receive their experience and suggestions.—Editor.]

Planer Clamp for Switch Points.—The planer clamp for switch points at the Canadian Steel Foundries, Point St. Charles plant, Montreal, which was described and illustrated in our Feb. issue, was invented by G. D. Smith, General Superintendent of the company's plants. Through a misunderstanding of facts he was not given the credit he deserves in this connection.

Mainly About Transportation People.

C. R. HOSMER, director, C.P.R., has left Montreal for a European trip.

Mrs. Strevel, wife of G. H. STREVEL, railway contractor, Winnipeg, died there, Feb. 26.

LORD STRATHCONA has given $25,000 towards the erection of a hospital in Strathcona, Alta.

SIR THOS. G. SHAUGHNESSY, President, C.P.R., returned to Montreal, Mar. 9, from Nashville. Tenn.

HON. J. S. HENDRIE has been re-elected Chairman of the Railway Committee of the Ontario Legislature.

C. M. HAYS, President, G.T.R. and G.T. Pacific Ry., left Montreal for England, via New York, Mar. 12.

J. H. GORDON, travelling freight agent, C.P.R., Winnipeg, Man., died there Mar. 7, from typhoid fever, aged 28.

A. R. MACDONNELL, contractor, Montreal, who died in England in July, 1911, left an estate valued at $1,095,790.

J. H. MARBLE, a lawyer, of California, has been appointed Secretary of the U.S. Interstate Commerce Commission.

CAPT. J. W. TROUP, Manager, B.C. Coast Service, C.P.R., returned to Victoria, B.C., Mar. 4, from a short holiday in California.

H. W. MITCHELL, ticket agent, Canadian Northern Ontario Ry., Port Hope, Ont., has joined the Canadian Ticket Agents' Association.

Mrs. Hobson, wife of JOSEPH HOBSON, M. Can. Soc. C.E., Consulting Engineer, G.T.R., Hamilton, Ont., died there Mar. 23, aged 79.

MAJOR R. W. LEONARD, Chairman National Transcontinental Ry. Commission, has been elected a director of the Toronto General Trusts Corporation.

H. E. GRANT was presented with a gold watch fob by the British Columbia Electric Ry.'s sales staff, Mar. 4, on his leaving Vancouver for California.

W. D. TRUMP, General Superintendent, Pere Marquette Rd., Detroit, Mich., has resigned after 30 years service, and will take a long holiday after April 1.

J. E. LAUGHLIN, for many years station agent for the G.T.R. and Wabash Rd., at Windsor, Ont., has resigned, and expects to move to California early in April.

H. P. DURDEN, General Agent, American-Hawaiian Steamship Co., Los Angeles, Cal., who died in San Diego, Cal., recently, was a native of Hamilton, Ont.

A. R. MANN, of the Northern Construction Co., which has large contracts on the Canadian Northern Ry., left Winnipeg, with his family, to reside in Vancouver.

G. M. HIGGERSON, Chief Dispatcher, Toronto, Hamilton and Buffalo Ry., Hamilton, Ont., was presented with a gun by his associates recently, on his leaving for the west.

SIR WM. WHYTE AND A. M. NANTON, of Winnipeg, are mentioned as probable members of the Hudson's Bay Co.'s Canadian board, which, it is said, will be established shortly.

LIEUT.-COL E. W. RATHBUN, President, Rathbun Co., which owns the Oshawa Ry. and the Thousand Islands Ry., has been elected President of the Dominion Artillery Association.

F. W. DOTY, President of the Doty Engine Works, Goderich, Ont., and formerly owner of the Doty Ferry Co., plying between Toronto and the Island, died at Goderich, Feb. 27.

T. GUILDFORD SMITH, M. Am. Soc. C.E., Manager of Sales for various subsidiary companies of the United States Steel Corporation, at Buffalo, N.Y., died there, from apoplexy, recently.

JNO. CORBETT, formerly General Foreign Freight Agent, C.P.R., and now in the marine and general insurance business, returned to Montreal, from a trip to Great Britain, Mar. 12.

W. STITT, General Passenger Agent, C.P.R. Eastern Lines, and G. H. HAM, of the C.P.R. headquarters staff, Montreal, were at the immigration conference at Fredericton, N.B., Mar. 8.

THE HON. JOSIAH WOOD, Senator, Sackville, N.B., President and General Manager, New Brunswick and Prince Edward Island Ry., has been appointed Lieutenant Governor of New Brunswick.

GEORGE BURY, Vice President and General Manager, C.P.R. Western Lines, and J. OBORNE, General Superintendent, British Columbia Division, C.P.R., were guests of the Vancouver Board of Trade, Feb. 24.

W. B. KEMP, heretofore chief clerk, District Freight Agent's office, C.N.R., Saskatoon, Sask., has resigned to enter private business with C. R. Hill, who recently resigned the position of District Freight Agent there.

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F. P. Gutelius, M. Can. Soc. C.E., Who has been appointed one of the commissioners to investigate National Transcontinental Railway matters.

J. W. STEWART, of Foley, Welch and Stewart, railway contractors, expects to return to Vancouver early in April. He is at present in Pasadena, Cal., and is reported to be rapidly gaining strength after his recent severe illness.

Mrs. F. L. CLERGUE, who died in New York, Mar. 1, was widow of the late Joseph Clergue, who was associated with the initiation of the industries at Sault Ste. Marie, Ont., and Mich., now owned by the Lake Superior Corporation.

T. H. ALLEN, who died in Ottawa, Mar. 1, aged 73, was confidential secretary to Andrew Onderdonk, when the latter had a contract from the Dominion Government for building a portion of the C.P.R. in British Columbia, in the late seventies.

B. C. GESNER, the Galena Signal Oil Co.'s expert in the Maritime Provinces, has been granted the Imperial service medal in consideration of 26½ years service on the Intercolonial Ry. as locomotive engineer, air brake demonstrator and instructor.

J. F. STEVENS, M. Am. Soc. C.E., former Chief Engineer of the Panama Canal and more recently President of the Oregon Trunk Ry. and other railways of the Hill system in Oregon, is now President of the Jno. F. Stevens Construction Co., New York City.

G. ATTWOOD, Chief Engineer, Hudson Bay and Pacific Ry., Prince Albert, Sask., died in London, Eng., Feb. 9. He was one of the engineers engaged in the construction of the cable and telegraph line projected from London, Eng., via Behring Strait, through Canada, to the United States.

J. N. LEITCH, B.A. Sc., youngest son of Jas. Leitch, K.C., Chairman of the Ontario Railway and Municipal Board, died in Toronto, March 24, aged 25, of pleuropneumonia. In the summer of 1910 he was engaged in the erection of steel bridges on the Temiskaming and Northern Ontario Ry.

V. SAUCEDO, A.M. Am. Soc. C.E., has resigned the position of Chief Engineer of the Monterey (Mexico) Water Works and Sewer Co., and of the Monterey Railway, Light and Power Co., of which Sir Wm. Mackenzie is President, to enter private practice in engineering in Monterey.

J. K. SAVAGE, Chief Dispatcher, C.P.R., Brandon, Man., was presented with two leather arm chairs by the conductors and trainmen, a smoking cabinet by the telegraphers, and some silverware by the general staff, on his leaving there, Feb. 23, to take up his new duties as Superintendent at Regina, Sask.

JNO. MCLEOD and Mrs. McLeod, who have resided in Winnipeg since 1879, celebrated their golden wedding Mar. 4. Before moving west Mr. McLeod was engaged in lumbering and railway contracting, and in the latter capacity built sections of the Quebec Central Ry. and of the old International Ry. (now merged in the C.P.R.)

G. A. JOYCE, formerly city ticket agent, C.P.R., at Woodstock, Ont., died suddenly from heart failure, in Chicago, Ill., March 3, aged 58. He had been connected with the C.P.R. as train dispatcher, yardmaster at West Toronto, and for seven years as ticket agent at Woodstock, and resigned some time ago to enter private business.

JNO. S. METCALF, President of the John S. Metcalf Co., Ltd., engineers and constructors of grain elevators, wharves, power plants, freight sheds, etc., Montreal and Chicago, died at his home at Evanston, Ill., Mar. 5, after several months' illness. He was born near Sherbrooke, Que., in 1847 and went to the United States when quite a young man.

W. J. HARVIE, A. Am. Inst. E.E., Chief Engineer of the Syracuse Rapid Transit Ry., Syracuse, N.Y., has been appointed Railway Manager of the operating department of J. G. White and Co., New York City, succeeding J. N. Shannahan, resigned to become Vice President and General Manager of the Newport News and Old Point Ry. and Electric Co., Newport News, Va.

W. A. MATHER, who has been appointed acting Superintendent, District 1, Manitoba Division, Kenora, Ont., was born at Oshawa, Ont., Sept. 12, 1886, and entered C.P.R. service, in the construction department, May, 1903, where he remained until Dec., 1910, when he was appointed Resident Engineer, District 2, Manitoba Division, Winnipeg, which position he held to the date of his present appointment.

W. T. DANIEL, whose appointment as Resident Engineer, District 2, Saskatchewan Division, C.P.R., Regina, was announced in our last issue, was born Sept. 10, 1886, and entered C.P.R. service, in the Engineering Department, May, 1909. In June, 1911, he was appointed assistant engineer of construction of the

Broad St. subway, Regina, Sask., which position he held to the date of the present appointment, Feb. 12.

W. C. NUNN, who died in Toronto Mar. 8, aged 76, was born in Yorkshire, England, and came to Canada in 1886, entering the G.T.R. service, in which he was agent at Whitby, Port Hope, Trenton and Belleville. He was captain of a G.T.R. company during the Fenian raid. He patented a railway signal, and subsequently went into the railway supply business, and at the time of his death was connected with the Convertible Car Co.

J. L. P. O'HANLY, civil engineer, Ottawa, Ont., died there, Mar. 22, aged 85. He had been an engineer on the Intercolonial Ry., Canadian Pacific Ry., director of the Ottawa and Gatineau Valley Ry., and Ontario commissioner in the Ontario-Quebec boundary survey in 1872. In 1881 he was on the western boundary survey of Manitoba, and reported also on the effect of the Chicago drainage canal on the level of the Great Lakes.

F. E. WARREN, who has been appointed Division Car Foreman, Ontario Division, C.P.R., West Toronto, and whose portrait appears in this issue, was born at Chelsea, Que., Aug. 29, 1872, and entered C.P.R. service, Dec. 10, 1897, since when he has been, to Dec. 1, 1902, Carpenter at Farnham, Que.; Dec. 1, 1902, to Dec. 1, 1905, charge hand at Farnham, Que.; Dec. 1. 1905, to Oct. 1, 1909, Assistant Foreman, Farnham, Que.; Oct. 1, 1909, to Mar. 11, 1912, Car Foreman at Hochelaga, Que.

S. KING, who about a year ago resigned the superintendency of the Canadian Car and Foundry Co.'s plant at Turcot, Montreal, and went to Europe for an extended trip, is now living in London, Ont. At present he is acting as one of the three commissioners who are appraising the Intercolonial and Prince Edward Island Railways' rolling stock, his colleagues being T. Williams, ex-Treasurer, I.R.C., who is the chairman of the commission, and W. Aird, ex-Master Mechanic, G.T.R. shops, Montreal.

C. K. HOWARD, whose appointment as Right of Way Agent, St. John and Quebec Ry., Fredericton, N.B., was announced in our last issue, was born at St. Andrews, N.B., Aug. 28, 1877, and entered C.P.R. service, Apr., 1894, since when he has been, to Mar., 1910, successively, operator, agent at Greenville Jct., Brownville Jct., McAdam Jct., and Fredericton, and Travelling Freight Agent, Atlantic Division, St. John; Mar., 1910, to date of present appointment, Jan. 15, Superintendent, Aroostook Valley Rd., Presque Isle, Me.

D. MCDONALD, whose appointment as Superintendent, Montreal and St. Flavie District, Intercolonial Ry., Levis, Que., was announced in our last issue, and whose portrait appears in this issue, was born at Ste. Hyacinthe, Que., Feb. 28, 1862, and entered Intercolonial Ry. service in 1880, since when he has been, to 1882, night agent and operator, Ste. Anne, Que.; 1882 to 1885, operator at Ste. Flavie, Que.; subsequently, to Jan., 1912, joint ticket agent, I.R.C., G.T.R., and Quebec Central Ry., Levis, Que. He is the youngest brother of the late A. R. McDonald, who was a superintendent on the I.R.C. from 1879 to 1897.

J. M. MACRAE, who has been appointed District Freight Agent, Canadian Northern Ry., Saskatoon, Sask., was born at Stornoway, Scotland, July 31, 1884, and prior to coming to Canada, was connected with the coasting steamship service connecting with railways in Great Britain; from Aug., 1906, to Mar., 1907, clerk and stenographer, Audit Department, C.N.R., Winnipeg; Mar., 1907, to Feb., 1911, successively, stenographer, tariff clerk, assistant chief clerk, rates and claims, and chief clerk, Freight Traffic Department, C.P.R., Winnipeg; Mar., 1911, to Feb., 1912, Traffic Manager, Imperial Oil Co., Winnipeg.

S. B. WASS, A.M. Can. Soc. C.E., who

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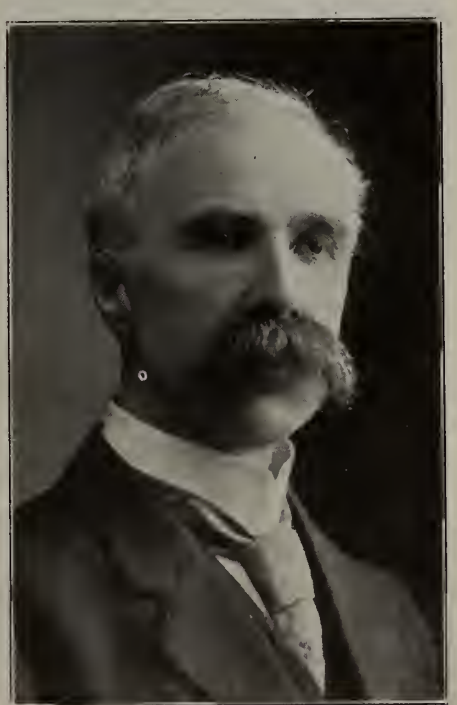
A. S. Dawson, B.A. Sc., M. Can. Soc. C.E., Chief Engineer, Department of Natural Resources, Canadian Pacific Ry.

has been appointed Assistant Chief Engineer, St. John and Quebec Ry., Fredericton, N.B., was born in Perth county, Ont., July 11, 1880, and graduated from the Faculty of Applied Science, Toronto University, in 1903. He has been, in



P265 D. McDonald, Superintendent, Montreal and Ste. Flavie District, Intercolonial Railway.

1904, draughtsman, Toronto and York Radial Ry.; 1905 to 1906, Resident Engineer, same road; 1906 to 1907, Resident Engineer on Construction, C.P.R. Walkerton Branch; 1907 to 1908, Assistant to Division Engineer, same road; 1908 to 1910, Chief Engineer, Aroostook Valley Rd.; 1910 to Feb., 1912, assistant to Division Engineer, C.P.R., Montreal, in charge of location.

G. HODGE, whose appointment as General Superintendent, Eastern Division, C.P.R., Montreal, was announced in our last issue, was born there, Oct. 2, 1874, and entered C.P.R. service, Mar. 24, 1890, since when he has been, to Aug. 8, 1890, junior clerk, Passenger Traffic Department; Aug. 8, 1890, to Apr., 1892, junior clerk, Vice President's office, Apr., 1892, to Jan., 1896, secretary to Vice President; Jan., 1896, to Feb., 1907, chief clerk to Vice President; Feb., 1907, to June, 1908, Superintendent, Montreal Terminals; June, 1908, to Mar., 1911, Superintendent, District 3, Eastern Division, Montreal; Mar., 1911, to Feb., 1912, Superintendent, District 2, Ontario Division, London.

C. R. HILL, who recently resigned the position of District Freight Agent, Saskatoon, Sask., to take up business as real estate and investment broker, there, entered railway service with the G.T.R. in 1900, in the local freight department, Toronto, and subsequently was in the offices of the Superintendent, Terminal Superintendent and Master of Bridges and Buildings, there. From Sept., 1902, to Apr., 1906, he was stenographer in the Traffic Manager's office, C.N.R., Winnipeg; Apr., 1906, to 1907, Travelling Freight Agent, same road, Winnipeg; 1907 to Nov., 1908, Travelling Freight Agent, same road, Saskatoon, Sask.; Nov., 1908, to May 1, 1910, Contracting Freight Agent, same road, Regina, Sask., and May, 1910, to Feb., 1912, District Freight Agent, same road, Saskatoon, Sask.

F. L. WANKLYN, who has been appointed General Executive Assistant, C.P.R., Montreal, was born at Buenos Ayres, Argentine, Feb. 25, 1860, and educated at Marlborough College, Wilts, Eng. He was articled to C. Savie, C.E., of the Manchester, Sheffield and Lincolnshire Ry. (now Great Central Ry.), and served an apprenticeship in the locomotive works at Gorton, Manchester, Eng., and was subsequently resident engineer, Lombardy Road Ry., Milan, Italy. He came to Canada, Jan. 1, 1881, and has been Assistant Locomotive Superintendent, G.T.R., Manager, G.T.R. locomotive works, Manager, Toronto Ry., General Manager and Vice President, Montreal St. Ry., and Vice President, Dominion Coal Co., until its amalgamation with the Dominion Iron and Steel Co. He was elected a member of the Montreal board of control, Feb. 1, 1910, resigning Mar. 1, 1912, on his present appointment.

A. S. COOK, who has been appointed Inspecting Engineer, National Transcontinental Ry., Ottawa, Ont., was born at Penobsquis, N.B., Nov. 20, 1873. His first engineering appointment was in 1899, as engineer in charge of construction of various parts of the Dominion Iron and Steel Co.'s plant at Sydney, N.S., where he remained until 1901, returning there for some months in 1902. He was, during 1901, on surveys for Nova Scotia Eastern Ry., and special survey work for the city of Sydney; 1901 to 1902, construction surveys and in charge of office, Cape Breton Ry.; 1902 to 1903, in charge of location and construction of electric street railway, Cape Breton Electric Co., at North Sydney, Sydney Mines and Glace Bay; 1903, Divisional Engineer, Chateauguay and Northern Ry., Quebec; 1904 to 1907, Resident Engineer, Dominion Power and Transmission Co., in charge of extension of hydraulic power plant, St. Catharines, Ont.; in winter seasons of 1906 and 1907, in charge of surveys, plans, etc., Buffalo, Niagara and Toronto Ry. proposed line from Niagara-on-the-Lake and St. Catharines to Fort Erie; 1907 to 1908, on design and construction of Coniagas smelter, Thor-

old, Ont.; Sept., 1908, to Jan., 1911, in charge of design and construction of hydraulic power plant, etc., for Merriton paper mills, Ont.; Jan. to Nov., 1911, Resident Engineer in charge of extensions, Dominion Power and Transmission Co. at St. Catharines, Ont.

Gas-Electric Motor Car for Quebec and Lake St. John Railway.

The Q. and L. St. J. Ry. has recently ordered from the General Electric Co., Schenectady, N.Y., a gas-electric car to be operated between Quebec and Lake St. Joseph, where the company has a summer hotel. While this will be the first of its kind in Canada, there have been several of like construction on United States lines, their peculiar field of adaptability being on branch steam lines where the volume of traffic does not warrant a frequent train service. It is stated that the total cost of operation and maintenance of these cars only runs up to from 18 to 20c. per mile.

These gas-electric cars are independent train units, self-contained in every particular. The power is derived from a gasoline engine, direct-connected to a generator in the cab of the car. This electric power is transmitted to electric motors on the two axles of the truck under the cab, there being no direct mechanical drive. This truck carries from 65 to 70 per cent. of the car weight, ensuring ample adhesion. The car is operated from the forward or cab end through a controller. Motors, control and generator comprise the complete electric drive, making a simpler arrangement than a mechanical drive.

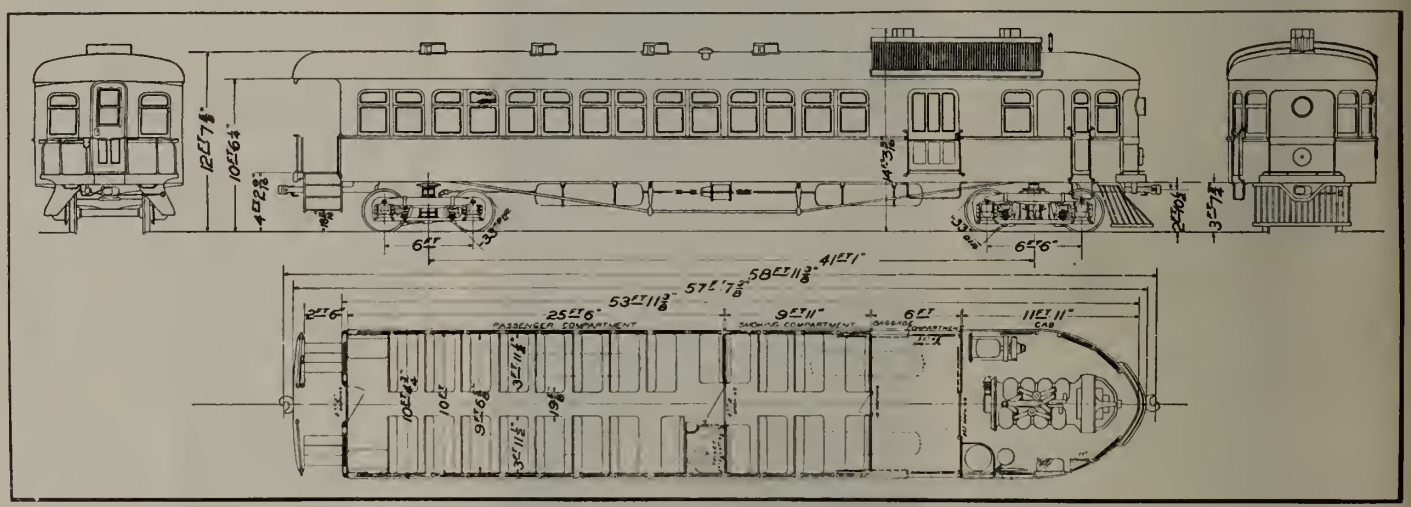


Diagram of Gas-Electric Motor Car for Quebec and Lake St. John Railway.

The car is divided into four compartments: passenger, smoking, baggage and cab. The general particulars are:—

Length over couplers	58 ft. 11⅜ ins.
Length over platform	57 ft. 7⅜ ins.
Length, body	53 ft. 11⅜ ins.
Length, passenger compartment	25 ft. 6 ins.
Length, smoking compartment	9 ft. 11 ins.
Length, baggage compartment	6 ft.
Length, cab	11 ft. 11 ins.
Width, over all	10 ft. 4¾ ins.
Width, inside	9 ft. 6⅝ ins.
Height, over all	14 ft. 3 3-16 ins.
Height, roof	12 ft. 7⅝ ins.
Height, coupler	2 ft. 10½ ins.
Height, floor	4 ft. 2 9-16 ins.
Wheel base, car	41 ft. 1 in.
Wheel base, driving truck	6 ft. 6 ins.
Wheel base, trailing truck	6 ft.
Wheels, diameter	33 ins.
Car weight	40.5 tons
Seating capacity	76

The car on delivery is to be run from Toronto to Trenton, Ont., out of which point it is to operate for some time prior to being sent down to the Quebec-St. Joseph service.

Fredericton and Grand Lake Coal and Railway Co.

The Fredericton and Grand Lake Coal and Ry. Co. was incorporated by the New Brunswick Legislature in 1910, with A. R. Slipp, H. P. Timmerman, C. F. Chestnut, H W. Woods. A. B. Wilmot, D. K. Hazen and P. Glasier as provisional directors, to build a line from the Intercolonial Ry. near Gibson to Minto, to connect there with the New Brunswick Coal and Ry. Co.'s line from Norton. The company was given very general powers for developing the country along the line; was authorized to acquire the New Brunswick Coal and Railway Co.'s line and to make agreements for running rights with the C.P.R., the Fredericton and St. Marys Bridge Ry., the Intercolonial Ry., and with any other railway that may build to a connection with the National Transcontinental Ry. The company was also authorized to build a line from its line in the parish of St. Marys to Marysville, and such other branches as might be necessary for the development of the country through which the line passes.

In 1911 the Legislature passed an act, which became effective April 13, 1911, having for its object the granting of further aid for the development of the coal areas in the counties of Queens and Sunbury. The act provided that a railway should be built from the C.P.R. at Gibson to Minto, connecting there with the New Brunswick Coal and Ry. Co.'s line, and that the Government would guarantee the bonds of any company building such a line to the amount of $15.000 a mile. A first mortgage of the railway, buildings and rolling stock was to be given to the Government as security for the bonds, and no guarantee of the bonds of any company was to be entered into unless the Dominion Government provided a subsidy on the usual conditions, up to $6,400 a mile; until a contract had been entered into with the C.P.R. or some other railway for the base of the line for 99 years, at a rental, payable to the province to satisfy the interest and redemption fund of the bonds, of 40% of the gross earnings of the line; that the company leases from the province for 99 years at a rental of 50% of the net earnings the New Brunswisk Coal and Ry. Co.'s line, which extends from Norton on the Intercolonial Ry. to Minto; and to take for a period to be agreed upon 100,000 tons of coal mined in Queens and Sunbury counties. If the percentage of earnings of the two lines paid as rental to the Government was more than sufficient to pay the interest on the bonds, it was to be returned to the company building the line.

During 1911 negotiations were carried on between the provisional directors of the F. and G. L. Coal and Ry. Co. and the Provincial Government with a view to the construction of the line mentioned. During the progress of the negotiations Sir Thos. Tait secured control of the company, and after some time the negotiations were brought to a successful issue, arrangements having been made for the variation of the terms mentioned in the act of 1911, in several directions.

The Legislature has under consideration a Government measure amending the act of 1911. in accordance with the terms agreed upon in the negotiations. The important alterations are that the starting point of the line shall be Gibson, on the Intercolonial Ry., instead of Gibson on the C.P.R.; that the line is to be leased by the C.P.R. or other company for 999 years; that the New Brunswick Coal and Ry. Co.'s line is to be leased for a similar period, instead of for 99 years; and that 50,000 tons of coal are to be purchased every year for 10 years, instead of 100,000 tons a year for some period to be agreed upon. The other provisions which are amended deal with the manner in which the guaranteed bonds shall be issued, and the funds produced reach the company.

Derailment on Curves is discussed in a paper by Arthur Rogers published by the Institution of Civil Engineers, in which the author reaches the conclusion that a locomotive is likely to overturn at a critical velocity lower than that at which the overturning will be caused by centrifugal forces alone. He points out that under certain conditions, where centrifugal forces are likely to cause overturning at 71 miles an hour, the effect of the drawbar pull and of unbalanced forces in the locomotive is to make the curve dangerous at 53 miles, particularly if brakes are applied. He also concludes that superelevation should never begin on a tangent, since its effect is to set up a lateral swaying of the locomotive, which, on reaching a sharp curve at high speed, may reduce the adhesion between the inner wheels and rail enough to cause derailment.

The G.T.R. management is reported, according to a Montreal dispatch, to have decided to grant the railway telegraphers' request for extra pay for Sunday work.

The Safety Car Heating and Lighting Co., in its monthly pamphlet, gives details of its general car lighting equipment, especially such as is required for lighting dining cars.

A tracklaying record comes from Northern Nigeria, where, on the Baro Kano Ry., under British engineers, 6⅓ miles of main track and 1,200 ft. of siding were laid with rails in one day.

Transportation Appointments Throughout Canada.

The information under this head, which is almost entirely gathered from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who may notice any error in our announcements will confer a favor by advising us.

Algoma Central and Hudson Bay Ry., Algoma Western Ry.—W. Mills, Master Car Builder, having resigned, the duties are being performed by T. Fraser, Master Mechanic. Office, Sault Ste. Marie, Ont.

Canadian Northern Ry.—R. Croasdell, heretofore General Advertising Agent, reporting to the General Traffic Manager, has been appointed in charge of publicity, reporting to the Third Vice President's office. Office, Toronto.

H. J. Whiteside, heretofore chief clerk in the General Advertising Department's advertising branch, has been appointed Advertising Agent, reporting to the General Traffic Manager. Office, Toronto.

On account of the resignation of A. Shields, General Master Mechanic, Winnipeg, as reported in our last issue, to engage in private business, all communications intended for the General Master Mechanic are to be send to S. J. Hungerford, Superintendent of Rolling Stock.

J. M. Macrae, heretofore Traffic Manager, Imperial Oil Co., Winnipeg, has been appointed District Freight Agent, C.N.R., Saskatoon, Sask., vice C. R. Hill, resigned to enter private business.

Canadian Pacific Ry.—F. L. Wanklyn, M. Can. Soc. C.S, has been appointed General Executive Assistant, with such duties as may be assigned to him by the President, from time to time. Office, Windsor St. Station, Montreal.

C. W. P. Ramsey, heretofore Division Engineer of Construction, Montreal, has been appointed Engineer of Construction, Eastern Lines, reporting to the Vice President. Office, Montreal.

C. B. Brown, heretofore Division Engineer of Construction, Montreal, has been appointed Principal Assistant Engineer, reporting to the Assistant Chief Engineer. Office, Montreal.

R. H. McDonald, heretofore Assistant Locomotive Foreman, Outremont, Que., has been appointed acting Locomotive Foreman, there, vice A. A. Scott, transferred.

F. E. Warren, heretofore Car Foreman, Hochelaga shops, Montreal, has been appointed Division Car Foreman, Ontario Division. Office, Toronto.

H. R. Matheson, heretofore chief clerk, Passenger Department, Chicago, Ill., has been appointed, temporarily, chief clerk to District Passenger Agent, Toronto, vice J. J. Rose, resigned to enter the Robt. Reford Co.'s service.

J. W. Orrock has been appointed Division Engineer, Lake Superior Division, vice F. Taylor, transferred. Office, North Bay, Ont.

W. A. Mather, heretofore Resident Engineer, District 2, Manitoba Division, Winnipeg, has been appointed acting Superintendent, District 1, Manitoba Division, vice J. Brownlee, deceased. Office, Kenora, Ont.

H. E. Haanel, heretofore Trainmaster, District 3, Manitoba Division, Brandon, has been appointed Trainmaster, District 1, Manitoba Division, vice J. D. Scott, resigned. Office, Kenora, Ont.

D. C. Chisholm has been appointed Resident Engineer, District 2, Manitoba Division, vice W. A. Mather, appointed acting Superintendent at Kenora. Office, Winnipeg.

G. F. Morrison has been appointed Travelling Car Service Agent, Winnipeg, vice R. E. Merkley, appointed Trainmaster at Brandon, Man.

D. E. Fisher, heretofore storekeeper at Field, B.C., has been appointed foreman of the lower floor, Winnipeg shops.

R. E. Merkley, heretofore Travelling Car Service Agent, Western Lines, has been appointed Trainmaster, District 3, Manitoba Division, vice H. E. Haanel, transferred to Kenora, Ont. Office, Brandon.

J. H. C. Perkin, heretofore at Winnipeg, has been appointed storekeeper at Hardisty, Man., vice R. S. Aylan, transferred to Field, B.C.

Jas. Watson has been appointed District Master Mechanic, Saskatoon, Sask., vice J. McAnany, transferred to Revelstoke, B.C.

W. McPherson has been appointed Locomotive Foreman, Moose Jaw, Sask., vice W. Jordan, resigned.

W. J. Coleman, heretofore locomotive engineer, has been appointed Locomotive Foreman, West Calgary Shops, Calgary, Alta., vice J. Doig, transferred to Red Deer, Alta.

The following appointments, some of which were reported in our last issue, have been made in connection with the recently formed Natural Resources Department:—

P. L. Naismith, heretofore General Manager, Alberta Ry. and Irrigation Co., has been appointed Manager, N.R.D. Office, Calgary, Alta.

T. Heeney, heretofore Chief Accountant, Alberta and British Columbia Land Department, has been appointed Assistant Manager, N.R.D. Office, Calgary, Alta.

P266 F. L. Wanklyn, M. Can. Soc. C.E., General Executive Assistant, Canadian Pacific Railway.

A. S. Dawson, heretofore Chief Engineer, Irrigation Department, has been appointed Chief Engineer, N.R.D. Office, Calgary, Alta.

Lewis Stockett, heretofore General Manager, Bankhead and Hosmer collieries, has been appointed General Superintendent, Coal Mining Branch, N.R.D. Office, Calgary, Alta.

Allan Cameron, heretofore General Traffic Agent, C.P.R., New York, has been appointed Superintendent, Land Branch, N.R.D. Office, Calgary, Alta.

F. W. Russell, heretofore chief clerk, General Land Department, has been appointed Land Agent for Manitoba, N.R.D. Office, Winnipeg, Man.

J. Hart, heretofore Assistant British Columbia Land Commissioner, has been appointed British Columbia Land and Timber Agent, N.R.D. Office, Calgary, Alta.

J. L. Doupe, heretofore Assistant Land Commissioner, Winnipeg, has been appointed General Townsite Agent, N.R.D. Office, Calgary, Alta.

W. J. Gerow, heretofore Land Inspector, has been appointed Land Agent for Saskatchewan, N.R.D. Office, Saskatoon, Sask.

L. A. Lambert has been appointed chief clerk, executive branch, N.R.D. Office, Calgary, Alta.

E. S. Doughty, heretofore Land Agent, Alberta and Irrigation Lands Department, has been appointed Land Agent for Alberta, N.R.D. Office, Calgary, Alta.

W. J. Elliott has been appointed Superintendent of Agriculture in charge of the agricultural section of the Land Branch, N.R.D. Office, Strathmore, Alta.

J. Doig, heretofore locomotive foreman, West Calgary shops, Calgary, Alta., has been appointed Locomotive Foreman at Red Deer, Alta., vice F. McFarlane, who has returned to the shop as a fitter.

J. H. Jackson has been appointed temporary Locomotive Foreman, Rogers Pass, B.C.

R. S. Aylan, heretofore storekeeper at Hardisty, Man., has been appointed storekeeper at Field, B.C., vice D. E. Fisher, transferred to Winnipeg shops as foreman of lower floor.

J. McAnany, heretofore District Master Mechanic, Saskatoon, Sask., has been appointed District Master Mechanic, Revelstoke, B.C., vice E. E. Austin, resigned.

J. A. McDonald, heretofore chief clerk to Assistant Passenger Traffic Manager, Winnipeg, has been appointed District Passenger Agent, Kootenay District, west of Kootenay Landing, and south of and including Arrowhead, B.C., vice W. J. Wells, resigned. Office, Nelson, B.C.

Allan Cameron, heretofore General Traffic Agent, New York, having been appointed Superintendent, Land Branch, Department of Natural Resources, Calgary, Alta., as reported in our last issue, his former position has been abolished. Communications on passenger traffic are addressed to W. H. Snell, Eastern Passenger Agent, and on freight traffic to W. F. Stevenson, Eastern Freight Agent, New York.

Grand Trunk Pacific Ry.—F. E. Corrigan, heretofore Locomotive Foreman, Fitzhugh, Alta., has been appointed Locomotive Foreman, Rivers, Man.

F. Lozo, formerly Locomotive Foreman, G.T.P.R., Melville, Sask., has been appointed Locomotive Foreman, Fitzhugh, Alta., vice F. E. Corrigan, transferred.

J. McGreevy, formerly Roadmaster, C.P.R., Medicine Hat, Alta., has been appointed Roadmaster, Calgary branch, G.T.P.R., vice T. Johnson, Assistant Roadmaster, assigned to other duties. Office, Mirror, Alta.

Grand Trunk Ry.—J. Hodge, heretofore in special service, Middle Division, has been appointed Special Agent, Eastern Division, Montreal, vice A. C. Lanning, appointed chief clerk in Superintendent's office, Montreal.

F. W. Bergman, Manager, Chateau Laurier Hotel, Ottawa, has been appointed General Manager, G.T.R. and G.T.P.R. hotel systems. Office, Ottawa.

M. Adams, heretofore chief clerk, Freight Department, Toronto, has been appointed chief accountant, same department, there.

C. R. Morgan, heretofore acting City Passenger and Ticket Agent, has been appointed City Passenger and Ticket Agent at Hamilton, Ont., succeeding his father, the late C. E. Morgan.

Deacon and Trow have been appointed City Ticket Agents, Stratford, Ont.

A. H. King, heretofore agent at Hensall, Ont., has been appointed agent at Ingersoll, Ont., vice S. J. Roy, appointed Travelling Auditor, Montreal, as announced in our last issue.

F. P. Simpson has been appointed

Resident Engineer at Detroit, Mich., vice T. T. Irving, promoted.

T. T. IRVING, heretofore Resident Engineer, Detroit, Mich., has been appointed Trainmaster, District 25 (C.S. and M.), and Districts 27 and 28, vice J. C. Talmage, resigned. Office, Durand, Mich.

Intercolonial Ry.—J. J. LEYDON, heretofore chief clerk, City Ticket Office, Halifax, N.S., has been appointed acting City Ticket Agent, there, vice H. A. Beck, resigned to enter the service of Cavicchi and Pagano, railway contractors.

National Transcontinental Ry.—A. S. COOK has been appointed Inspecting Engineer. Office. Ottawa, Ont.

E. P. GOODWIN has been appointed Inspecting Engineer for outside work.

New York Central and Hudson River Rd., Lake Shore and Michigan Southern Ry.—W. K. VANDERBILT, JR., heretofore Assistant to the Vice President, New York Central Lines, has been appointed Vice President, N.Y.C. and H.R.R., and L.S. and M.S.R. Office, New York City.

M. S. BARGER has been appointed Treasurer, for lines west of Buffalo, N.Y., vice C. F. Cox, deceased. Office, New York City.

Northern Pacific Ry.—TRACEY HOWARD, heretofore chief clerk, has been appointed District Passenger and Freight Agent, vice G. W. Hardisty, deceased. Office, Montreal.

Pennsylvania Rd.—The circular, relating to the appointment of C. B. BRODIE as Canadian Passenger Agent, Toronto, announcement of which was made in our last issue, is as follows:—"With a view of bestowing more direct care and attention upon passenger travel to and from points in Canada, it has been decided to establish a passenger agency for that purpose, and C. B. Brodie has been appointed Canadian Passenger Agent, with office at 911 Traders Bank Bldg., Toronto, reporting to B. P. Fraser, District Passenger Agent, at Buffalo, N.Y."

Pere Marquette Rd.—NEWMAN ERB, President, Minneapolis and St. Louis Rd., and Iowa Central Ry., has been appointed Chairman of the Executive Committee, P.M.R., with supervising control of the executive and administrative departments. Office, New York City.

G. C. CONN, heretofore Freight Traffic Manager, has been appointed Vice President, in charge of the Freight Department, vice A. Patriarche, resigned. Office, Detroit, Mich.

W. E. WOLFENDEN has been appointed General Passenger Agent, vice H. F. Moeller, resigned. Office, Detroit. Mich.

A. WARD, heretofore at Muskegon, Mich., has been appointed General Car Foreman at St. Thomas, Ont., vice H. T. O'Toole. transferred to his former position as Coach Foreman at Grand Rapids, Mich.

St. John and Quebec Ry.—S. B. WASS, A.M. Can. Soc. C.E., heretofore assistant to Division Engineer, C.P.R., Montreal, has been appointed Assistant Chief Engineer, St. J. and Q.R., as reported in our last issue. Office, Fredericton, N.B.

Toronto, Hamilton and Buffalo Ry.—W. J. WARNICK has been appointed Chief Dispatcher, vice G. M. Higgerson, resigned. Office, Hamilton, Ont.

Western Representation on Board of Railway Commissioners.—The Minister of Railways stated in the House of Commons recently that the Government did not intend to create a western section of the Board. Two commissioners might be stationed in the west to deal with western matters, but there could not be two different boards, which might give conflicting judgments on the same matters.

The Canadian H. W. Johns-Manville Co., Ltd., has removed its Winnipeg office, storerooms, etc., to 89 Princess St. from 320 Main St., owing to increased business. M. C. Burgess is in charge.

Railway Finance Meetings Etc.

Alberta Ry. and Irrigation Co.—An act has been passed by the Dominion securities to be issued and secured un-

P267 Allan Cameron,
Superintendent of Land Branch, Department of Natural Resources, Canadian Pacific Railway.

der sec. 136 to 146 of the Railway Act to $30,000 a mile. The proceeds of the sale of any of the securities issued may Parliament limiting the amount of be used to redeem pro tanto any of the

P268 F. E. Warren,
Divisional Car Foreman, Canadian Pacific Ry., West Toronto.

company's now outstanding mandatory securities.

Dominion Atlantic Ry. — Passenger earnings for Feb., $28,700; freight earnings, $53,300; total earnings, $82,000, against $75,600 total earnings for Feb., 1911.

Lake Champlain and St. Lawrence Jct. Ry.—Following are the officers and directors for the current year: President, B. A. Kimball, Concord, N.H.; Vice President, W. J. Hobbs, Malden, Mass.; Secretary-Treasurer, H. Blodgett, St. Johnsbury, Vt.; other directors: W. M. Parker, Manchester, N.H.; G. M. Kimball, J. F. Webster, Concord, N.H.; L. Tuttle, Brookline, Mass. The line, which runs from Stanbridge to St. Guillaume Que., is leased to the C.P.R.

Maritime Coal, Ry. and Power Co.—A meeting of bondholders was called to be held in Montreal, Mar. 28, to pass resolutions assenting to certain proposed modifications of the rights of bondholders against the company, with the object of enabling the company to make a further issue of $1,000,000 of bonds, and to authorize the making of the necessary supplementary trust deed.

Minneapolis, St. Paul and Sault Ste. Marie Ry.—The usual semi-annual dividends of 3½% on preferred and common stocks, have been declared payable Apr. 15, to stockholders of record Mar. 22.

Ontario and Sault Ste. Marie Ry.—The annual meeting was held at Montreal, Mar. 20. The following officers and directors were re-elected for the current year:—President, C. M. Hays; Vice President, W. Wainwright; Secretary-Treasurer, F. Scott; other directors, M. M. Reynolds, W. H. Biggar, K.C., E. J. Chamberlin, R. S. Logan and Jos. Hobson.

Pere Marquette Rd.—It was announced in New York, Mar. 2, that J. P. Morgan and Co., will take up the $650,000 equipment notes of the company now due, and that the Guaranty Trust Co. will purchase and hold them for six months.

Quebec Central Ry.—Gross earnings for Jan., $79,668.08; expenses, $67,499.19; net earnings, $12,168.89, against $64,726.17 gross earnings; $56,910.84 expenses; $7,815.33 net earnings, for Jan., 1911. Aggregate gross earnings for seven months ended Jan. 31, $793,636.26; expenses, $541,993.48; net earnings, $251,642.78, against $688,096.08 aggregate gross earnings; $471,370.24 expenses; $216,725.84 net earnings for same period 1910-11.

Toronto, Hamilton and Buffalo Ry.—At a special meeting of shareholders held in Hamilton, Ont., Feb. 29, an increase was authorized in the capital stock from $2,500,000 to $5,000,000.

Temiskaming and Northern Ontario Railway Report.

The report for the year ended Oct. 31, 1911, submitted in the Ontario Legislature recently, shows the following mileage:—Main line, North Bay to Cochrane, 252.8; branch lines, Charlton branch, 78; Kerr Lake, 3.9; Haileybury spur, 1.64; Porcupine branch, 28; total, 41.34 miles; yards and sidings, main and branch lines, 84.85; Liskeard spur, .64. Total mileage, 397.63.

Following is a condensed statement of revenue account for the year, compared with the previous year:—

	1911.	1910.
Revenue from transportation	$1,708,249.02	$1,522,020.05
Revenue other than transportation	72,715.81	69,831.97
Total operating revenue	1,780,964.83	1,591,852.02
Operating expenses	1,181,998.63	1,165,361.36
Net operating revenue	598,966.20	426,490.66
Ore royalties	17,060.56	31,762.92
	616,026.76	458,253.58
Hire of equipment, etc.	22,874.07	22,123.27
Total earnings	$ 593,152.69	$ 436,130.31
Paid Treasurer of Ontario	$ 515,000.00	$ 420,000.00

Express Companies Statistics to June 30, 1911.

Under an amendment to the Railway Act passed in 1911 the Railways and Canals Department has commenced the collection of statistics from express companies, Canadian and foreign, doing business in Canada. Returns were received from the following companies:—Canadian, Canadian Northern, Dominion, American, Great Northern, National, United States, and Wells Fargo, the forms used being those adopted by the U.S. Interstate Commerce Commission with some immaterial alterations.

The capitalization of distinctly Canadian companies was reported as follows:

Canadian Ex. Co.	$1,705,200
Canadian Northern Ex. Co.	300,000
Dominion Ex. Co.	2,000,000
Total	$4,005,200

The amount realized in cash for the foregoing stock issue was reported to have been $3,165,200. The cost of real property and equipment was $2,109,-566.33. This amount is made up of the following items, applicable to Canadian companies:—

Real estate used in operation		$ 720,200.00
Buildings and fixtures		703.816.96
Horses	$141,423.06	
Vehicles	191,063.66	
Other equipment	353,052.65	
		685,539.37
Total		$2,109,556 33

The facts relating to U.S. companies have been eliminated from the statements of capital and cost of property, as it would be confusing to include them.

The total operating mileage in Canada on June 30 was as follows:—

Over steam roads	25,377.90
Over electric lines	213.81
Over steamboat lines	1,792.00
Over stage lines	146.00
Miscellaneous	55.75
	27,585.46

In addition, outside operations covered 16,778 miles. This applied chiefly to ocean going steamers. The operating mileage was distributed among the provinces as follows:—

New Brunswick	1,119.43
Nova Scotia	1,396.32
Prince Edward Island	298.10
Quebec	3,914.64
Ontario	9,938.20
Manitoba	3,339.04
Saskatchewan	3,034.43
Alberta	1,371.08
British Columbia	2,814.02
Yukon	59.48
Foreign	300.72
	27,585.46

The foregoing mileage was divided among the various companies as follows:

American Ex. Co.	1,252.43
Canadian Ex. Co.	7,230.31
Canadian Northern Ex. Co.	4,422.29
Dominion Ex. Co.	13,709.33
Great Northern Ex. Co.	575.40
United States Ex. Co.	224.84
Wells Fargo and Co.	90.70
National Ex. Co.	80.16
Total	27,585.46

Right at the threshold of the work of gathering express statistics a difficulty arose with respect to U.S. companies operating in Canada. They did not, and could not, make an absolutely accurate separation of revenue and operating cost as between U.S. and Canadian business. A simple illustration will make the situation in that regard clear: A package is expressed from Ottawa to New York, the charges on which are say $1. These charges might be prepaid or not. If prepaid, it would be manifestly misleading and unsound to credit $1 to revenue in Canada, inasmuch as that sum provided for the carrying of the package over several hundreds of miles of line in the U.S. If, on the other hand, the charges were collected at the New York end, a certain proportion should be credited to revenue in Canada. What should that proportion be? After considering the whole matter, and having regard to the analogy in railway accounting, U.S. companies were instructed to report their earnings and operating expenses in Canada on the basis of the proportion which their mileage in Canada bore to their total mileage. That is to say, on the package to which reference has been made, the proportion of the $1 received at either end which should be credited to Canada would be the proportion established on a mileage basis. The return of U.S. companies given in this report are in accordance with that ruling. It does not provide for an entirely accurate statement of facts, but it is the most practicable plan of accounting which could be adopted under the circumstances.

The gross receipts from operation for the year were $9,913,018.31. From this was deducted $4,553,861.43 as the cost of express privileges, leaving $5,359,-156.88 as the operating revenue for the year. The operating expenses were $4,151,227.91, which was equal to 77.46% of the operating revenue. Deducting operating expenses from operating revenue, a net balance of $1,207,928.97 is the result. To this should be added a net revenue of $3,506.60 from outside operations, bringing the total up to $1,-211,435.57. So far as Canadian companies were concerned, the balance as between operating revenue and operating expenses was $1,114,897.59. After deducting $27,589.64 for taxes, which amount is slightly larger than the figures given in the balance sheet, and is taken from the taxation table, the remainder was equal to 27.14% on the capital liability. For Canadian companies, the ratio of operating expenses to operating revenue was 76.71%. After making deductions for taxes and dividends, the balance carried forward to profit and loss by all companies for the year was $683.664.33.

The following balance sheet places the results of the year in convenient form for review:—

Gross receipts from operation		$9,913,018.31
Less express privileges		4,553,861.43
Operating revenue		$5,359,156.88
Operating expenses		4,151,227.91
Net operating revenue		$1,207,928.97
Net revenue from outside operations		3,506.60
Other income		41.67
Total net revenue		$1,211,477.24
Less taxes	$ 19,695.78	
Less dividends	481,624.32	
Other deductions	26,492.81	
		527,812.91
Balance for the year		$ 683,664.33

The charges for express privileges—chiefly the right to operate over certain railways—were equal to 45.93% of the gross revenue. For Canadian companies by themselves the cost of these operating rights was equal to 45.66% of the gross revenue.

The sources of revenue and the various amounts received were as follows:—

From transportation:		
Express revenue		$9,590,907.99
Miscellaneous		53,796.73
Total		$9,644,704.72
Other than transportation:		
Money orders—domestic	$181,395.28	
Money orders—foreign	16,985.06	
Travellers cheques—domestic	2,895.74	
Travellers cheques—foreign.	1,186.21	
C.o.d. cheques	39,701.71	
Other earnings	26,149.59	
		268,313.59
Gross revenue		$9,913,018.31

The operating expenses, apart from the cost of express privileges, were distributed under the following heads:—

Maintenance	$ 33,721.75
Traffic expenses	104,307.20
Transportation expenses	3,871,901.69
General expenses	141,297.27
Total	$4,151,227.91

The details of the maintenance account are as follow:—

Superintendence	$ 312.19
Buildings, fixtures and grounds	90.68
Office equipment	1,313.53
Horses	3,038.87
Vehicles—repairs	11,165.15
Vehicles—renewals	658.17
Stable equipment	2,218.01
Transportation equipment	547.73
Other expenses	87.23
Total	$33,721.75

Of the foregoing total amount, $14,-390.19 was not distributed into items.

Traffic expenses consisted of the following items:—

Superintendence	$ 55,631.57
Outside agencies	4,162.55
Advertising	8,081.56
Traffic associations	3,700.66
Stationery and printing	12,859.38
Other expenses	13,532.00
Total	$104,307.20

Of this amount, $6,339.48 was not distributed.

Transportation expenses were made up of the following details:—

Superintendence	$1,202,406.59
Office employes	278,461.55
Commissions	357,009.65
Wagon employes	138,378.99
Office supplies and expenses	26,082.42
Rent of local offices	37,645.62
Stable employes	10,282.47
Stable supplies and expenses	441,178.43
Train employes	157,788.13
Train supplies and expenses	2,286.13
Transfer employes	2,345.36
Transfer expenses	59,711.74
Stationery and printing	97,592.79
Loss and damage—freight	76,840.97
Loss and damage—money	361.31
Damage to property	54.77
Injuries to persons	680.64
Other expenses	576.73
Total	$3,871,901.69

A total of $364.270.09 was not distributed in the foregoing transportation expenses. The Dominion Express Company returned an aggregate of $1,152,-860.53 under the head of superintendence, which really included the salaries and wages of all classes of employes. An effort will be made to have this item adjusted, so that the value of comparison will not be lost in future reports.

The items constituting general expenses were as follows:—

Salaries and expenses of general officers	$ 27,575.46
Salaries and expenses of clerks, etc.	50,438.05
General office supplies and expenses	14,779.04
Law expenses	2,199.99
Insurance	6,204.71
Pensions	6,006.11
Stationery and printing	2,950.72
Other expenses	576.83
Total	$141,297.27

Items are lacking in the above for $30,566.46 of the total.

The business transacted by companies in financial paper is very large, and for the year was as follows:—

Financial Paper.	Number.	Amount
Money orders—domestic	2,789,691	43,361,803.54
" " foreign	87.215	2,265,980.16
Travellers' cheques, domestic	37,857	908,051.35
" " foreign	47,646	1,200,930 00
C. o. d. cheques	.....	3,639,778 93
Telegraphic transfers	.....	113,726,91
Letters of credit issued	.....	156,921.01
Other forms	.....	488,660.67
	2,962,439	52,165,852.57

Money orders were reported as being on sale at 4,628 offices throughout the Dominion.

The number of express offices in the Dominion was 2,720.

The total amount paid by companies in taxes for the year was $32,869.25, distributed as follows:—

New Brunswick	$ 468.31
Nova Scotia	316.12
Prince Edward Island	515.00
Quebec	11,683.34
Ontario	11,307.75
Manitoba	1,138.76
Saskatchewan	62.83
Alberta	869.39
British Columbia	1,131.17
Yukon	330.00
Foreign	2,256.82

The above statement is defective in that $2,789.76 reported by the American Ex. Co. was not distributed. The difference between the total here and in

the balance sheet is due to the failure of the Dominion Ex. Co. to deduct taxes from income.

Following are returns of equipment owned on June 30, 1911:—

Equipment	Number.	Value.
		$ cts.
Car safes, stationary	133	24,497.21
Double wagons	98	32,811.43
Four wheel trucks	1,917	53,737 72
Horses	814	148,593.06
Messengers' safes	685	16,344.56
Messengers' packing trunks	1,085	15,688.34
Office furniture, &c.		66,357.05
Office safes	935	91,612.29
Single wagons	681	115,113.54
Sleighs	733	48,573.19
Stable equipment		27,956.21
All other equipment		71,803.37

The report of express companies operating in the United States for the year ended June 30, 1911, issued by the Interstate Commerce Commission, shows the Canadian Ex. Co. operating over 7,128.27 miles; the Canadian Northern Ex. Co. over 3,314.50 miles, and the Western Ex. Co. over 3,509.69 miles, against 7,794.27 miles, 3,129.62 miles and 3,456.39 miles, respectively, in the previous year. During the year the Canadian Ex. Co. issued $199,200 additional shares.

Railway Rolling Stock Notes.

H. G. Beasley, Superintendent of the Esquimalt and Nanaimo Ry., is reported as having stated that it had been decided to use oil burning locomotives on the line to minimize the danger of forest fires.

The car body is to be very handsomely finished and replete in every detail. It is designed to run on the level at a speed as high as 50 miles an hour, running down to 17 miles an hour on a 2% grade.

The Minister of Railways stated in the House of Commons recently that the supplementary estimates will authorize expenditure for rolling stock for the Intercolonial Ry. amounting to practically the whole of the I.R.C.'s surplus.

The Intercolonial Ry. has ordered three vans to be built at its Moncton shops; two sleeping cars and one dining car from the Canadian Car and Foundry Co., and two sleeping cars and one dining car from the Pullman Co.

The C.P.R., between Feb. 14 and Mar. 14, ordered four wooden flat cars, eight stock cars, one horse car, three freight refrigerator cars, one box baggage car, one baggage and express car and two vans, at its Angus shops, Montreal, and one steam shovel in the United States.

Referring to the tenders which were recently invited by the Winnipeg board of control, for a steam locomotive and steam shovel for the operation of the gravel pit at Bird's Hill, we are officially advised that such a purchase has been abandoned, and that it is likely an electrical equipment will be installed instead.

The Algoma Central and Hudson Bay Ry. has ordered 70 Otis composite general service cars from the Hart-Otis Car Co., similar to those described and illustrated in our Dec., 1911, issue, making 195 of this type of car which the company has purchased. These cars, while having a carrying capacity of 110,000 lbs., are only 37,800 lbs. tare weight. They will be built by the Canadian Car and Foundry Co.

The Intercolonial Ry. has received the following additions to rolling stock since Jan. 19—two vans and nine platform cars from its Moncton shops; 195 box cars, 60,000 lbs. capacity and 20 platform cars, 80,000 lbs. capacity, from the Canadian Car and Foundry Co.; three 10-wheel passenger locomotives from the Canadian Locomotive Co., and 49 platform cars, 80,000 lbs. capacity, from the Nova Scotia Car Works.

O'Brien, Fowler and McDougall Bros., railway contractors, have ordered 20 Hart-Convertible ballast and construction cars, 40 tons capacity, 1912 design, from the Hart-Otis Car Co., which will be built by the Canadian Car and Foundry Co. Following are the chief dimensions:—

Capacity	30 tons
Length over end sills	32 ft.
Width over side sills	8 ft. 9 ins.
Height from rail to floor	4 ft. 1¼ ins.
Truck centres	23 ft. 8 ins.
Wheel base of truck	5 ft. 2 ins.

The C.P.R., between Feb. 14 and Mar. 14, received the following additions to rolling stock—four tourist cars, 22 colonist cars, two first class cars, eight baggage and express cars, one business car, 12 vans, two switching locomotives class U3, and one tank locomotive class T2, from its Angus shops, Montreal; 14 steel underframes for Lidgerwood unloaders, from the Canadian Car and Foundry Co.; two steam shovels from the Marion Co., and 691 steel frame box cars from the United States.

The Canadian Northern Ry., between Feb. 15 and Mar. 14, received the following additions to rolling stock—60 steel underframe flat cars and two cafe-parlor cars from the Canadian Car and Foundry Co.; 72 Hart convertible cars from the Hart-Otis Car Co.; 75 flat cars, 20 cabooses and four second class coaches from the Crossen Car Co.; 280 box cars from the Nova Scotia Car Works; 10 ten-wheel locomotives from the Montreal Locomotive Works; five switching locomotives from the Canadian Locomotive Co., and one consolidation locomotive from the Canada Foundry Co.

Following are chief dimensions of the 13 special Rodger double plough distributing cars which the C.P.R. has ordered from the Hart-Otis Co., and which will be built by the Canadian Car and Foundry Co.:—

Length over end sills	36 ft. 8 ins.
Width over side sills	8 ft. 10 ins.
Length inside as hoppers	20 ft. 10 ins.
Length inside as gondolas	34 ft. 8 ins.
Width inside	8 ft. 8 ins.
Width over all	10 ft. 2½ ins.
Width at top	9 ft. 10 ins.
Height from rail to floor	4 ft. 4½ ins.
Height from rail to top of car	8 ft. 1⅜ ins.
Height inside	8 ft. 9¼ ins.
Truck centres	26 ft. 8 ins.
Wheel base of truck	5 ft. 4 ins.
Length of hopper door opening	16 ft. 8¼ ins.
Width of hopper door opening	2 ft.

Following are the chief details of the three six-wheel switching locomotives, which the Central Vermont Ry., has ordered from the Lima Locomotive and Machine Co., Lima, as mentioned, in our last issue:—

Cylinders	20 by 26 ins.
Driving wheels	56 ins.
Tires	3½ by 5½ ins.
Journals	9¼ by 12 ins.
Wheel base, engine	12 ft. 8 ins.
Wheel base, engine and tender	42 ft. 5½ ins.
Weight in working order	145,250 lbs.
Weight, engine and tender	247,000 lbs.
Boiler, type	Straight top, radial stayed
Boiler, diar.	66 ins.
Tubes, no. and diar.	264 2 ins.
Tubes, length	12 ft. 9½ ins.
Firebox	98½ by 40 ins.
Heating surface, firebox	148 sq. ft.
Heating surface, tubes	1,772 sq. ft.
Heating surface, total	1,920 sq. ft.
Grate area	27.3 sq. ft.
Tender, capacity, water	4,500 U.S. galls.
Tender capacity, coal	8 tons
Tender wheels	33 ins.
Journals	5 by 9 ins.
Brakes	Westinghouse E.T. 6
Lubricator	Detroit triple 22

A Canadian Society of Civil Engineers branch has been established at Victoria, B.C. F. C. Gamble, M. Can. Soc. C.E., Provincial Public Works Engineer, is Chairman, and R. W. MacIntyre, M. Can. Soc. C.E., is Secretary.

Grand Trunk Pacific Railway Telegraph Lines.

A. B. Smith, Manager of Telegraphs, is reported as having stated that an additional 830 miles of line will be strung this year as follows:—Main line, 250 miles; Winnipeg to International boundary, 135 miles; between Winnipeg and Moose Jaw, 100 miles; between Biggar and Calgary, 100 miles; between Biggar and Battleford, 50 miles; Cutknife branch, 50 miles; in the vicinity of Prince Albert, 45 miles; Calgary branch, 100 miles. He is also reported to have stated that 2,000 miles of pole line have already been built, upon which is strung 6,500 miles of wire, and that the present season's construction will bring the wire mileage to 10,000.

Examination Papers for Railway Employes.—The Board of Railway Commissioners has issued a circular to a number of railway companies calling attention to the fact that the order of Nov. 9, 1910, requiring the companies to file with the Board within 90 days thereafter a copy of each examination paper for the examinations required to be passed by employes has not been complied with and directing the companies to comply forthwith.

Lighting of Main Line Switches.—The Board of Railway Commissioners has issued a circular calling the attention of railway companies to the fact that on a number of lines where trains are run at night, main line switches are not being lighted; also to point out that the rules require night signals to be displayed from sunset to sunrise, and that when weather or other conditions obscure day signals, night signals must be used in addition.

Protection of Trestles Where Oil Burning Locomotives are Used.—The Board of Railway Commissioners passed the following order:—16066. Mar. 6. Re order 11446, Aug. 2, 1910, requiring railway companies subject to its jurisdiction to provide protection for wooden trestles therein specified. And re application of the Vancouver, Victoria and Eastern Ry. and Navigation Co. for exemption from complying with the requirements of said order. It is ordered that in territory where oil burning locomotives alone are used, the applicant company may discontinue the use of "zinc covering over caps and intersections," as required under said order.

The Railway World, Philadelphia, Pa., in dealing with the future of the Panama canal, and commenting on the proposed tolls, says: "British Columbia people say that in a few years they will be able to send 10,000,000 tons of wheat via the Panama canal. If the canal toll is 50c a ton, here is $5,000,000 from Canadian wheat alone, when northwestern Canada is the wheat granary of Europe, which it now appears destined to be, and before many years have passed."

The principal event at the demonstration of the Canadian branch of the St. John's Ambulance Association at Ottawa, March 6, was the contest between five-men teams representing the eastern and western sections of the C.P.R. The Windsor station team, Montreal, had proved itself the champion in the contests among the classes on the eastern lines, and the Winnipeg shop team champion of the Western classes. The final contest went to the Western team by 480 to 456 points out of a possible of 600 points.

G. C. Hyatt, Vice President and General Manager, Bellingham Bay and British Columbia Ry., is reported to have stated in San Francisco, Cal., Mar. 15, that the line had not been sold to the Chicago, Milwaukee and Paget Sound Ry., as press reports stated, and that its transfer was not under consideration.

Traffic Orders by the Board of Railway Commissioners.

The dates given for orders are those on which the hearings took place and not those on which the orders were issued:—

Demurrage on Cars Delayed in Delivery.

16048. Feb. 26.—Re application of Montreal Chamber of Commerce relative to delays in delivery of goods in cars, and requesting that the railway companies be compelled to pay demurrage on cars arriving in yards and not delivered within 24 hours. Upon hearing of application at Montreal in the presence of counsel for the Canadian Car Service Bureau, the C.P.R., the G.T.R. and the Canadian Northern Ontario Ry., no one appearing for the applicants, it is ordered that the application be dismissed.

Rate on Hardwood Lumber from Fort William.

16059. March 4.—Re application of Seaman, Kent Co., Ltd., of Fort William, Ont., complaining against the rate of 80c per 100 lbs. charged by the C.P.R. on hardwood lumber from Fort William to Vancouver, and applying for the rate of 45c per 100 lbs. charged by the railway company on rough cedar, fir, etc., from Vancouver to Fort William. It is ordered that the present rate of 80c per 100 lbs. charged by the C.P.R. on lumber from Port Arthur and Fort William to Vancouver be disallowed; and that the railway company within 30 days from the date of this order substitute in lieu thereof a rate of 55c per 100 lbs. on lumber (including flooring), in carloads of a minimum weight of 40,000 lbs.

Grain Rates for Almonte, Ont.

16057. Mar. 1.—Re application of Wylie Milling Co. of Almonte, Ont., complaining that the C.P.R. discriminates against Almonte, and in favor of Renfrew, Eganville and Douglas, by carrying grain from Georgian Bay ports to Montreal, including milling-in-transit at the last named points, at a lower rate than to Montreal, including milling-in-transit at Almonte. Upon the notice to the C.P.R. to show cause why a maximum rate of 10¾c. per 100 lbs. should not be charged on ex-lake grain from Kingston to Montreal, including milling stop-over at Almonte, and upon the hearing of the application in Ottawa, Oct. 17, 1911, and what was alleged; and upon the report of the Board's Chief Traffic Officer, it is ordered that the Kingston and Pembroke Ry. Co., jointly with the C.P.R., shall file a tariff within 30 days from the date of this order establishing a rate of 10¾c. per 100 lbs. on ex-lake grain, in carloads, from Kingston to Montreal, including stop-over at Almonte for milling purposes. The application, in so far as it alleges discrimination against Almonte and in favor of Renfrew, Eganville, and Douglas, in the carriage of grain from the Georgian Bay ports to Montreal is dismissed.

Rates on Granite from Beebe Jct., Que.

16116. Mar. 13. Re application of Stanstead Granite Quarries Co., Ltd., under sec. 323 of the Railway Act, for an order disallowing that part of Tariff C.R.C. 1300 covering the rates on granite shipments from Beebe Jct., Que., to Montreal, Ottawa, Toronto, and other points, filed by the Boston and Maine Rd., effective Mar. 14, it is ordered that item 31 of the said tariff be disallowed; the company to have leave to apply, upon notice to complainants, for permission to reinstate in the said tariff the rates hereby disallowed.

White Pass and Yukon Route Rates.

The Board has given judgment in this case, but the formal order had not been issued when this page was sent to press. An order was made in Jan., 1911, after a lengthy hearing at Vancouver, reducing the freight and passenger rates of the railway by a third, to go into effect on April 1. The company appealed to the late Government, and the operation of the new schedule was stayed by the Board. The appeal contained new evidence of decreased earnings and diminished traffic in 1910, and the case was re-opened by the Board. It is now found that if the cut previously ordered had gone into effect the company in 1910 would have defaulted to the extent of $127,560.90 in the payment of interest on its bonds, and there would be nothing for the stockholders. The judgment states that while people should be protected from extortionate charges, it is of equal importance that the capital invested in transportation companies should be permitted to earn fair and reasonable dividends. The order of Jan., 1911, is rescinded. At the same time, the company is making substantial reductions. The case is not to be finally disposed of until the company at the end of its fiscal year has submitted statements showing the results of the new rates.

Discriminating in Town Tariffs.

At the Board's sitting in Ottawa, April 16, railway companies subject to its jurisdiction will be required to show cause why the existing discrimination between localities with reference to their town tariffs should not be removed, as far as possible, by widening the scope of their application.

Joint Tariffs in Canada.

At the Board's sitting in Ottawa, jurisdiction will be required to show cause why an order should not issue calling for the publication and filing of joint tariffs between points in Canada (where such have not already been published and filed) less than the combination of the local rates of the several companies to and from the junction point or points; also to state their views as to the extent to which the said local rates might be reduced on joint traffic.

NOTICE TO CONTRACTORS.

Tenders for a Sewer Diversion on Verandrye and Archibald Streets, St. Boniface, Man.

SEALED TENDERS addressed to the undersigned, and marked on the envelope "Tender for Sewer Diversion," will be received at the office of the Commissioners of the Transcontinental Railway at Ottawa until 12 o'clock noon of the fifteenth day of April, 1912, for the construction, in accordance with the plans and specifications of the Commissioners, of a reinforced concrete sewer at St. Boniface.

Plans, details and specifications may be seen and Forms of Tender may be obtained at the office of Mr. Gordon Grant, Chief Engineer, Ottawa, Ont., and Mr. A. G. Macfarlane, District Engineer, St. Boniface, Man.

Tenders must be made on the forms supplied by the Commissioners and must be signed and sealed by all the parties to the tender and witnessed, and be accompanied by an accepted cheque on a Chartered Bank of the Dominion of Canada, payable to the order of the Commissioners of the Transcontinental Railway, for a sum equal to ten per cent. (10 p.c.) of the amount of the tender.

The right is reserved to reject any or all tenders.

By order,

P. E. RYAN,
Secretary.

The Commissioners of the Transcontinental Railway.

Dated at Ottawa this 22nd day of March, 1912.

Newspapers inserting this advertisement without authority from the Commissioners will not be paid for it.

The Railway to Hudson Bay.

Reports from Pas Mission, Sask., state that the last of the piers for the substructure of the bridge across the Saskatchewan River is about completed, and that preparations are being made for the erection of the superstructure, the steel for which is on the way. This work is being done by Mackenzie, Mann and Co.

The contractor for the grading of the line from the north side of the river to Split Lake, J. D. McArthur, had a conference with the Minister of Railways at Ottawa, Feb. 29. He stated that every effort would be made to get the 185 miles completed within a year. A subcontract has been let to McMillan Bros., who are establishing supply camps at points about ten miles apart, and have everything in readiness to go on with the work at the earliest possible moment.

It was reported in Ottawa, Mar. 8, that a further distance of 130 miles from Split Lake to the crossing of the Nelson River at Kettle Falls will shortly be put under contract. It is stated that the reports of the engineers show that whether Port Nelson or Fort Churchill is chosen as the terminus of the line, the route will be the same as far as Kettle Falls.

A survey party in charge of F. P. Moffatt has started over the route from Kettle Falls to Port Nelson, and another party under F. L. Lawledge left Pas Mission, Mar. 5, to go over the route from Kettle Falls to Fort Churchill. An expedition is being fitted out to make further explorations of the approaches to both ports, and when all three reports are in the Government will be able to make a final decision as to where the bay terminus will be located.

A report from J. Armstrong, Chief Engineer, presented in the House of Commons, Mar. 4, gives details of the season's survey work and shows that the line to Port Nelson will be 415 miles long and to Fort Churchill, 498 miles. The reports as to the conveniences of the two ports show that while both sides of the Nelson River are suitable for terminals, the available space at Fort Nelson is inadequate. The cost of constructing terminals at Port Nelson is estimated at $2,205,000, and at Fort Churchill at $2,625,000. Except for a natural breakwater at Fort Churchill the advantages are said to be all with Port Nelson, both as a terminus and from a navigation standpoint. (Mar., pg. 126.)

Douglas Fir for Car Building.—Our last issue contained some information on this subject from the Interior Department's Forestry Branch, and also opinions we elicited from N. Curry, President, Canadian Car and Foundry Co.; D. M. Campbell, General Manager, Preston Car and Coach Co., and R. W. Burnett, General Master Car Builder, C.P.R. G. R. Joughins, Superintendent of Motive Power and Rolling Stock, Intercolonial Ry., N.B., has since written us as follows:—"In regard to a comparison of the mechanical and physical properties of Douglas fir and yellow pine. We have been specifying Douglas fir for a number of years in the construction of freight cars, to be used as sills, side plates, ridge pole, purlins and sub-purlins; and on passenger cars to be used as sills, upper flooring and belt rails, with very satisfactory results. We have not as yet specified this wood for interior finish on passenger cars; it might, however, be suitable for the interior work on baggage, postal and even colonist cars, but it would hardly be a rich enough wood for day cars or sleeping cars."

Electric Railway Department

Jig for Boring and Facing Small Bearings in the Drill Press.

In the Halifax Electric Tramway Co.'s shops at Halifax, N.S., D. B. Logan, Foreman Machinist, has devised several ingenious little jigs for expediting the repair work on the cars of the company. Of these kinks, the one shown herewith is among the best.

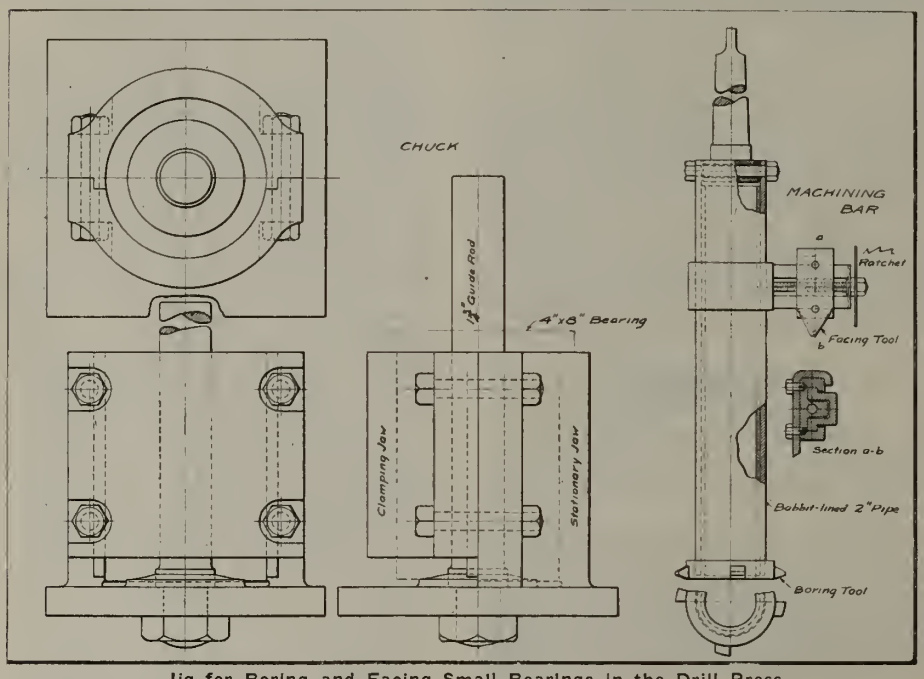
Not having a specially designed journal boring machine, nor having a sufficient amount of work to warrant the installation of one, the brasses were originally bored in an engine lathe, being mounted in a temporary rig on the lathe carriage for the purpose; a boring bar between centres bored the brass to size. This inconvenient method of boring led to a consideration of the possibility of producing them on the drill press by the use of a properly constructed jig and tool. The result was the introduction of the outfit shown in the accompanying illustration.

The babbit lined brass bearing is secured with a corresponding mate in a jig or chuck of the form and construction noted in the illustration. This consists of a cast iron base with a projecting sleeve, one half of which is a stationary jaw, forming part of the base, while the other part, or clamping jaw, is secured to the stationary jaw by bolts in the manner indicated. The two bearings are secured in place by tightening up the clamping jaw on the contained brasses, the bore of the chuck corresponding to the outside diameter of the journal brasses. Extending up through the clamp base, and concentric with the bore there is a 1¾-in. guide rod, rising 6 ins. above the top of the clamp. The reasons for this rod will be apparent later.

The boring bar is shown to the right in the illustration. Its body consists of a 14-in. piece of 2-in. wrought-iron pipe, lined with babbit through nearly its full length, giving an inside diameter of 1¾ ins. to make a snug working fit over the 1¾-in. guide rod of the chuck. The drive from the upper end is one of the most noteworthy features of construction, constituting as it does a universal joint. The taper shank is integral with a block of just such size as to fit loosely into the barrel of the boring bar. A ⅜-in. bolt through the bar diameter, passes through this block, the hole it passes through being about 1-16 in. larger in diameter than the bolt, giving a loose action. The socket end is thus free to sway through one plane on its carrying bolt, and through a small angle in a plane at right angles by reason of the loose fit on the cross bolt. This provides a universal joint motion, a feature that is essential in view of the fact that otherwise the chuck must be very carefully levelled on the drill table to give a correct alignment with regard to the spindle, should the boring bar be solid with its driving end. The bar with this construction is guided on the guide rod, the chuck being merely prevented from turning on the table, the flexibility of the boring bar taking up any incorrectness in original alignment.

The boring tool, screwed on the end of the boring bar, as indicated, is in form very similar to a milling cutter, having cutting teeth on its circumference. The usual feed of the drill carries this cutter down the guiding bar, boring out the babbit lining of the journal bearing through its full length. At the completion of this operation, a facing tool is brought into play. The tool for the end facing is mounted on a small carriage, running on guides attached to the boring bar. This small carriage is moved along its guiding ways by a 5-16-in. screw with a ratchet wheel on its outer end, to give the necessary cross feed at each revolution.

Accurate work with rapidity of production has attended the use of this contrivance. It is now possible to completely machine a pair of brasses in 15 minutes, making a considerable reduction in operating periods.



Jig for Boring and Facing Small Bearings in the Drill Press.

B. L. Jones, of Buffalo, N.Y., General Manager, Lewiston and Youngstown Frontier Ry., has been elected Vice President of the company. He is also Treasurer and General Manager, Niagara Gorge Rd.

The Handling of Snow by Electric Railways.

SARNIA STREET RY.—H. W. Mills, Manager:—"We depend upon scrapers, with which our double truck cars are equipped, to keep our lines open during the winter. We have not missed a trip this winter, in spite of the fact that we have had a large quantity of snow at zero weather nearly all January, the thermometer going as low as 20° below."

WINNIPEG ELECTRIC RY.—Wilson Phillips, Superintendent:—"We have very little snow in this city; so far this winter we have had practically none. At present there is not enough snow on the streets for good sleighing. We have about 120 miles of single track laid and six snow sweepers; we have also a rotary plow. This was ordered a number of years ago when we had a very severe storm in March, but we have never had any necessity for using it since."

EDMONTON RADIAL RY.—R. Knight, Superintendent:—"The snow problem in this locality is much less difficult than in the case of roads in the eastern parts of the country. The snow in Edmonton is very dry and the snowfall is very light. The heaviest snow storm we have had to contend with this year occurred several weeks ago, when the fall amounted to from 6 to 8 ins. No difficulty is experienced in handling the snow with sweepers, of which the railway has two, one a single truck, and the other a double truck sweeper."

TORONTO AND YORK RADIAL RY.—C. L. Wilson, Assistant Manager:—"We are using a nose plough, having two double end equipments of this description. We also have a snow plough of the steam road type, equipped with motors and wings, and flanges, which has proved very satisfactory. We also use a rotary snow plough for severe conditions. The steam road snow ploughs have been used extensively on our road, and more than the rotary, on account of the speed at which the rotary works."

BERLIN AND WATERLOO ST. RY.—V. S. McIntyre, Superintendent:—"We manage to keep our lines open very well by the use of a sweeper which handles approximately 6½ miles of track. Two men can operate this sweeper when out in country where there are no horses to look after, but through towns it is necessary to carry an extra man to hold horses, as the sweeper throws a big cloud of snow and invariably frightens horses. We use, on the average, about four sets of brooms per winter on this sweeper. These brooms cost us, installed, $8.60 a set. In the towns of Berlin and Waterloo the snow is carted off the streets, on which we run, immediately after each snow storm. We pay one-fifth of the total cost for this cartage. At several places along our lines we erect snow fences. These fences are placed about 100 ft. away from track, and they help very much to keep the snow from drifting over the tracks. The total cost to us for removing and fighting snow last year was $374.86. The sweeper we have would be of no use to open up a line that has 4 or 5 ft. of snow on it, but it will clear tracks which have up to 2 ft. of snow on them. We find the best way to keep our road open is to get the sweeper in operation as soon as a snow storm starts and keep it going until the storm is over. We have not been tied up at all so far this winter, although it has been the most severe we have had for some years."—Electric Traction Weekly.

Interurban Line from Sault Ste. Marie.

Press reports say that some people at Sault Ste. Marie, Mich., have completed arrangements for the construction of an interurban railway from Sault Ste. Marie to the "Snows" this year. The survey has been completed, a private right of way over the entire length of the route secured and sufficient capital to finance the deal practically assured. Application will be made to the railway commission for authority to incorporate with $500,000 capital stock. While a small amount of outside capital has been subscribed the promoters announce the road will be controlled by local capital. Work on the new road will be started early this spring and will probably be completed late in the fall. The terminal of the route will be on Island 8 and a car ferry will be operated from that point 22 miles across Lake Huron to Cheboygan, connecting there with the Detroit and Mackinac Ry. for the south and east. Gasoline-electric cars will be used on the run and a locomotive and freight cars will handle the bulk of the heavier freight traffic at night. The new road will open up a section of the upper peninsula that has never known travel excepting by means of stages.

Winnepeg Electric Railway Company's Annual Report.

Following are extracts from the report for the year 1911, presented at the annual meeting recently:—

The net earnings were $1,110,573.69, after providing for all operating expenses, taxes, the city's proportion of earnings, and other fixed charges. Out of these net earnings four quarterly dividends were paid, amounting to $690,000, leaving a surplus of $420,573.69, which has been transferred to the credit of profit and loss account, making a total credit to this account at Dec. 31, 1911, of $1,616,773.25.

All the properties have been efficiently maintained. In accordance with the plan of extensions adopted at the last annual meeting, the following improvements and additions to the equipment and system have been made: 10.842 miles of track was laid as follows: 9.70 miles with 80 lb. rails with concrete foundation and asphalt pavement; and .981 miles of surface track. Thirty large double-truck closed motor cars with wide vestibules equipped with air brakes and all other modern appliances to insure safety of passengers and operators, were constructed in the company's Winnipeg shops and put in service, together with 2 double-truck open cars of latest modern design, and 1 motor flat car and 1 trail flat car for construction purposes; 1 134 new poles were erected, and 216.-424 lbs. of wire with 189 transformers put up, in extension of the light and power distribution system; 50,358 feet of new gas mains were laid, and 895 new gas services were installed in extension of the gas distribution system. The new 1,000,000 cubic feet gas holder was completed and put in operation. A new auxiliary steam plant of 12,000 h.p. capacity was constructed and is in operation, which gives a capacity of 20,000 h.p. of auxiliary steam plant to protect the company and its customers from any serious break-down at the hydraulic works.

Winnipeg Electric Railway Company.

	1911.	1910.
Gross receipts	$3,829,749 67	$3,284,241 83
Operating expenses	1,900,967 67	1,654,833 60
Operating expenses per cent. of earnings	49.64	50.39
Net earnings	1,928,782 00	1,629,508 23
Net income per cent. of capital	49.64	15.58
Passengers carried	40,281,245	31,369,421
Transfers	10,012,048	8,003,038
Railway earnings per capita	10.46	10.02

Winnipeg, Selkirk and Lake Winnipeg Ry.

Gross earnings	$89,185 85	
Gross expenses	45,891 43	
Net earnings		$43,294 42
Fixed charges—		
Interest on bonds	20,000 00	
Taxes, etc.	14,565 34	
		34,565 34
Surplus for year		$ 8,729 08

Suburban Rapid Transit Company.

Gross earnings	$57,995 49	
Gross expenses	46,161 81	
Net earnings		$11,833 68
Fixed charges—		
Interest on bonds	25,000 00	
Taxes, etc.	2,542 12	
		27,542 12
Deficit for year		$15,708 44

The directors for the current year, who were re-elected, are:—President, Sir Wm. Mackenzie; Vice President, Sir Wm. Whyte; Sec.-Treas., F. Morton Morse; other directors, Sir Wm. C. Van Horne, Sir Donald D. Mann, D. B. Hanna, A. M. Nanton, Hugh Sutherland, R. J. Mackenzie.

Halifax Electric Tramway Company's Annual Report.

Following are extracts from the report for the year 1911, presented at the annual meeting recently:—

Compared with previous years the results of operations are gratifying. Gross and net earnings were increased. During 1910 the rates to general consumers of electric light were reduced 10%. On May 1, 1911, a further reduction in these rates was made (equivalent to about 1% on the capital stock). The rates of wages to employes were substantially increased during the year, consumers and employes thus participating with the shareholders in the general prosperity of the company.

During the year, the Point Pleasant tram line was, at the request of the Park Commissioners, extended into Point Pleasant Park. This extension has proved a great convenience to the large number of persons who frequent the park.

During 1912 it is proposed to further increase the efficiency of the tram service by double tracking the belt line (which will include the construction of about 3¼ miles of single track) purchasing additional cars, providing increased car house accommodation and installing an additional unit in power house—the whole involving an expenditure of approximately $200,000.

In addition to expenditure on capital account, a large amount was expended for repairs and improvements to the property, the physical condition of which has been well maintained.

Income Account.

Passenger receipts	$229,927 84	
Light and power earnings	203,119 88	
Gas earnings	61,310 24	
Sundry earnings (less provision for bad debts	9,041 36	
		$502,399 32
Operating expenses		$256,874 00
Interest on bonds		30,000 00
Net earnings to surplus account		215,525 32
		$502,399 32

Dividends aggregating $112,000 were paid and $22,288.43 was appropriated to renewals and betterments in 1911, depreciation in securities, provision for bad debts, and accident claims prior to 1911.

The percentage of operating expenses to income was 51.97%; passengers carried, 5,212,257; car mileage, 918,121.

The directors for the current year, who were re-elected, are:—President, Hon. David MacKeen; Vice President, J. Y. Payzant, W. B. Ross; other directors, A. Kingman, J. C. Mackintosh, C. C. Blackader, F. B. McCurdy, M. C. Grant, O. E. Smith.

St. John Railway Company's Annual Report.

Following are extracts from the report presented at the annual meeting, Feb. 26, for the year 1911:—

The year's business shows a net profit, after providing for interest on bonds and all other charges, of $54,232.41, out of which four quarterly dividends of 1½%, amounting to $48,000, have been paid, leaving a balance of $6,232.41, which has been transferred to profit and loss account. The accrued dividend of 1% for Nov. and Dec., 1910, was included in the first quarterly dividend paid April 19, 1911.

During the year the following works have been undertaken:—

New brick and steel car barn on Wentworth St., 55 by 212 ft. Brick and steel office and supply building on Nelson St., 28 by 41 ft. In connection therewith we purchased the Fisher and Cathers lots adjoining. We purchased during the year a lot of land owned by the Lantalum estate, on which part of our power house is situated. A large amount has been expended for repairs and improvements on the railway and light system, the physical condition of which has been well maintained. It is proposed to remove the railway tracks from Britain St., between Wentworth and Charlotte Sts., and place them on Broad St.

It will be necessary to provide additional cars, and we propose to have built at once six new p.a.y.e. combination cars.

At the last session of the Legislature, authority was given the company to construct and operate lines for the transmission of electric current for light, heat and power throughout Kings county; and power was also granted to develop and operate water powers in that county. Your directors propose to extend the electric light service during the present year to Rothesay, Milford and Crouchville. We have acquired all the property, franchises and privileges granted to the Carleton Electric Light and Power Co.

At the last session of the Legislature, authority was given the company to issue bonds or debentures for $250,000. It will be necessary to sell these bonds to provide for capital expenditure.

Your directors have been conducting negotiations with the Provincial Government for crossing the new cantilever bridge, to be erected at the falls. The terms proposed to us have been too onerous, but we hope to arrange a fair settlement.

We are about completing arrangements with the Dominion Government for crossing the Intercolonial Ry. at Haymarket Square, so as to extend our railway service to the cemetery and Crouchville.

The directors for the current year, who were re-elected, are:—James Ross, President; Col. H. H. McLean, K.C., M.P., Vice President; R. B. Emerson, J. Manchester, J. J. Tucker, W. Downie, F. E. Sayre, F. R. Taylor, J. M. Robinson.

The New Orleans and Grand Isle Traction Co., Ltd., has been incorporated under the Dominion Companies Act with $10,000,000 capital stock and office at Toronto. The principal object, no doubt, is to acquire and operate the New Orleans Southern and Grand Isle Ry. and the Algiers Ry. and Power Co., which were referred to in our Feb. issue, pg. 88, and of which C. E. A. Carr, formerly General Manager, Quebec Ry., Light, Heat and Power Co., is General Manager, C. D. Warren, of Toronto, being President of the New Orleans, Southern and Grand Isle Ry.

Electric Railway Projects, Construction, Betterments, Etc.

Alberta Electric Ry—The Dominion Parliament has authorized the Alberta Electric Ry. Co. to change its name to the Alberta Interurban Ry. Co., and has authorized organization as soon as 25% of shares to the extent of $10,000 a mile of the section first proposed to be built shall have been subscribed, and 10% thereon paid in cash. The construction of the other sections of the line can only be undertaken on the same conditions.

We are officially advised that the prospectus prepared sometime ago was not issued, and a new one has been put out by the Land Traction Co. of Canada, which was incorporated under the Alberta ordinance 1417, on Sept. 15, 1911. The authorized capital of the L.T. Co. is $500,000, and the capital of the A.E. Ry. Co. is $10,000,000, with power to issue bonds at the rate of $30,000 a mile on 1,200 miles of railway. There have been put on the market $250,000 "A" shares of the L.T. Co. at par, and $450,000 of 30 year 5% (2% sinking fund) first mortgage bonds of the A.E. Ry. Co. with a bonus of one share of the A.E. Ry. common stock to each $100 bond. The L.T. Co. has acquired such share of the A.E. Ry. stock as has been thought fair and reasonable remuneration for the work it has done and has arranged to do, and the balance of the A.E. Ry. stock is held by trustees for future construction. The directors of the L.T. Co. are:—J. Breckenridge, S. E. Beveridge, W. R. Wood, W. A. Lowry, and C. S. Drummond, Calgary, Alta.

The first section of the line proposed to be built extends from Calgary passing through Rocky View, Yankee Valley, Irricana and Carbon to Red Deer, and we are advised that the location surveys are practically completed. A large number of the local improvement district councils have already passed the formal resolution required for the free use of the highways for the railway.

A general meeting of the shareholders has been called to be held at Calgary, April 16, for organization purposes, and to enter into a contract with the Land Traction Co. for the construction of the first section of the line, and to authorize the issue of the mortgage bonds in respect of the same. (Mar., pg. 147.)

Berlin and Bridgeport Electric Ry.—The general plan for the extension of the line, for which legislative sanction is being asked, shows a route via Bloomingdale, connecting with Conestogo with a spur of about a mile, crossing the C.P.R. by an overhead bridge at Montrose, and thence to Elora and Fergus, Ont. The distance between Bridgeport and Elora by the proposed route will be about 15 miles. It is proposed to have a switching connection with the C.P.R. at Montrose. (Mar., pg. 147.)

British Columbia Electric Ry—We are officially advised that the line under construction on the Saanich Peninsula, Vancouver Island, runs north 23 miles from Victoria to Deep Cove, near the head of the peninsula. There will be a branch to Union Bay. Both these points are on the sheltered waters of Saanich Inlet. At Union Bay the company has secured the extensive tract of land, known as Meadlands, which it is proposed to develop as a residential and pleasure resort, and a wharf is to be built. It is quite possible that a ferry service may be established to the mainland, as well as a line connecting with the various islands, but at present the company has no plans in this direction. A contract for building the first 18 miles was let to Moore and Pethick, in Nov., 1911. Grading is being gone on with.

Press reports state that work will be started at once on the projected cut off of 3.5 miles from Highland Park to New Westminster, and that the work will be finished in six months. It is said it will be double tracked, with a maximum gradient of 2.7%.

Burrard, Westminster Boundary Ry. and Navigation Co.—W. McNeill, Assistant General Manager of the Western Canada Power Co., is also President of a railway company with the above title, which proposes to build an electric railway from Vancouver to Mission, B.C. The plans which have been filed with the Dominion Railways Department show a line, starting from Main and Keefer streets, Vancouver, east to Nanaimo St., across Hastings townsite, via Burnaby to Port Moody, on by the projected C.P.R. yards at Coquitlam, crossing the Pitt River, and continuing along the Dewdney trunk road to the Stave River falls, where the Western Canada Power Co.'s plant is situated, and then southerly to the Fraser River at Mission. There will be some heavy grading and embankment work to provide an easy and uniform gradient. It is proposed to build the section of the line from Mission to Pitt River first, and it is expected to have this completed by Mar. 31, 1913. It is estimated that the bridge crossing the Pitt River will cost $750,000. The Western Canada Power Co. has just completed the installation of the first two units of a 54,000 h.p. hydro-electric plant at Stave River Falls. (May, 1911, pg. 409. See also Western Canada Power Co., Mar., pg. 149.)

Calgary Municipal Ry.—Work on the construction of the extension to the site of the C.P.R. new shops at Maharg, Alta., was started Feb. 26. (Mar., pg. 147.)

Cape Breton Electric Co.—We are officially advised that the company will make surveys during the summer for extensions to New Waterford, N.S. At present is not possible to give any definite statement as to what construction may be done. (Mar., pg. 147.)

Coteau Power Co.—We are officially advised that surveys are being prosecuted vigorously both at the point where it is proposed to develop power, and for the location of the projected lines of railway in the Okanagan district, B.C. (Mar., pg. 147.)

Edmonton Radial Ry—It is proposed to build during this year new lines and extensions on five streets, the total length of which will be 5.09 miles.

The city commissioners have decided to erect the new car barn on the site of the present barn at Syndicate Ave. and Gallagher St. The new building will be built over and around the present barn, which will then be torn down and taken away. The estimated cost is $60,000. (Mar., pg. 147.)

Forest Hill Electric Ry.—Application is being made to the Ontario Legislature to incorporate a company with this title to build an electric railway from the northern boundary of Toronto, on Forest Hill road, northerly and northwesterly to two miles north of Eglinton Ave.; from Eglinton Ave. southerly along Bathurst St. to the northern boundary of Toronto; along Eglinton Ave. from Yonge St. to Dufferin St., and branches. Mills, Raney, Lucas and Hales, Toronto, are solicitors for applicants.

The Galt, Preston and Hespeler Electric Ry.'s franchise in Galt, Ont., has been renewed for 10 years. (Dec., 1911, pg. 1171.)

Halifax Electric Tramway Co.—We are officially advised that the company is building a second track on the loop line, a length of 5.5 miles. Some of the work has already been done, and there remains about 3.3 miles of the second track to be laid. The work proposed to be done this year will be on Oxford St., Quinpool Road, Windsor St., Almon St., and Agricola St. It is expected to have the work completed by the summer of 1913. It is intended also this year to extend the track from the corner of Cunard and Gottingen streets, along the latter street for nearly a mile.

It is also proposed to enlarge the two car barns during this year. At the power house a new 1,500 k.w. steam turbine, 80% power factor, with all necessary auxiliaries, is to be installed. (Mar., pg. 147.)

Hamilton, Grimsby and Beamsville Electric Ry.—At the annual meeting of shareholders, Feb. 27, President Dixon stated that the directors were not in a position to say when the projected extension from Beamsville to St. Catharines, Ont., would be gone on with. (Mar., pg. 147.)

Hamilton Radial Ry.—Survey parties have been at work since Feb. 20, between the end of the track at Oakville, and a point of junction with the Toronto and York Radial Ry. at Port Credit, or an extension of the Toronto Suburban Ry.

Hamilton, Waterloo and Guelph Ry.—New York engineers who have been going over the route, completed their work Mar. 15, and it is reported that construction will probably be started within a month. The engineer who will have charge of construction for McArthur Bros., who are undertaking the financing, was expected to be in Hamilton Mar. 30, to make final arrangements for construction.

Hull Electric Co.—We are officially advised that the company will build an extension from the main line to the Ottawa Racing Association's track, a distance of over half a mile, as soon as arrangements have been completed. The extension will have a double track, with a loop at the race course end to permit the use of single end cars. (Dec., 1911, pg. 1069.)

Humber Valley Electric Ry.—The provisional directors named in the application to the Ontario Legislature for the incorporation of a company with this title are:—R. H. Smith, C. M. Garvey, F. Regan, W. G. Jackson, Toronto. The company proposes to build an electric railway from Dundas St., in Lambton Mills, southerly along the west bank of the Humber River, to the Lake Shore road, and thence easterly to Sunnyside Ave., Toronto. Power is asked to connect with existing railways. The Legislature has approved of the principle of the measure, and proposes to defer its coming into operation until Jan., 1913, to give the city time to decide whether it will build the line. (Feb., pg. 91.)

Kawartha Transportation Co.—The applicants to the Ontario Legislature for the incorporation of a company with this title are: L. H. Grahame, E. R. Tate, C. W. S. Dunn, H. G. Fitzgerald, Lakefield, Ont.; L. M. Hayes, Peterborough, Ont. They propose to build electric railways from Peterborough through Lakefield to Stoney Lake, and thence to Apsley; from Peterborough to Chemong Lake, and from Peterborough to Rice Lake, Ont. (Feb., pg. 91.)

Ladner, B.C., to Huntingdon, Wash.—Press reports state that the International Railways and Development Co. has under consideration a proposition to build an electric railway from Ladner to New Westminster, B.C., and thence to Blaine and Huntingdon, Wash.

London and North Western Ry. of Canada.—Press reports state that a syndicate of English and Belgian capitalists is negotiating for the control of this company, as well as of other companies having electric railway charters west of London, Ont., with a view of

completing through lines from London to Windsor and Sarnia, and giving connection to all towns in the district. (Mar., pg. 148.)

London Street Ry.—Bids will shortly be asked for the fitting up of an additional steam plant for power production. (Mar., pg. 148.)

Maharg Electric Ry—The Alberta Legislature last session incorporated a company with this title, to build an electric line radiating from Maharg, Alta. C. A. Owens, G. O'Grady, J. Ruse, Calgary, are provisional directors. (Mar., pg. 148.)

Medicine Hat, Alta.—At a meeting of the city council, Feb. 29, notice was given that at the next meeting a bylaw authorizing the building of a municipally owned electric railway would be introduced. (See Medicine Hat Electric Ry.)

Medicine Hat Electric Ry.—The Alberta Legislature has incorporated a company with this title to build from Medicine Hat to Dunmore, returning by a different route into the city; and for another line to Elkwater Lake. The provisional directors are:—A. F. Krappel, D. W. Brown, W. Overplank, Medicine Hat, Alta. (Feb., pg. 148.)

Montreal.—The section in the Montreal city bill, before the Quebec Legislature, authorizing the borrowing of $5,000,000 to build a system of underground railways, was abandoned in committee, Mar. 8. (Mar., pg. 148.)

Montreal and Southern Counties Ry.—A bylaw granting a franchise through the municipality of Laprairie, Que., has been approved by the taxpayers, and a bylaw granting a franchise in Granby, Que., is being considered by the town council.

The railway committee of the Granby, Que., city council has approved the plans of the company's proposed line from Montreal to that city. W. B. Powell, Vice President, is reported to have stated on his return from Granby, Mar. 15, that petitions had been received from Pauline and Abbotsford, asking that branches be built from the Montreal-Granby line to serve them.

Montreal Tramways Co.—We are officially advised that track was laid on Sherborne St. East, from St. Lawrence St. to Cadieux St., 0.10 of a mile, in Jan. The construction was temporary, but the line will be put in a permanent condition in the spring.

President Robert is reported to have stated, Mar. 14, that the company is prepared to go on with an extension of lines in the city, even before a contract is signed by the city council. The company is not prepared to build lines into open fields in order to please land speculators, but is anxious to build lines in the city to accommodate the people and to provide an adequate service. If the council will get down to business, the company is ready to start building the lines at once.

Morrisburg and Ottawa Electric Ry.—The Ontario Legislature is being asked to grant an extension of time for the building of this projected railway from Ottawa to Morrisburg, Ont. G. D. Kelley, Ottawa, is solicitor for applicants. (Dec., 1911, pg. 1171.)

Niagara, Welland and Dunnville Electric Ry.—The Ontario Legislature is being asked to extend the time within which the lines authorized by chap. 10 of the statutes of 1910 may be built, and to increase the capital stock to $500,000, and the company's bonding powers to $30,000 a mile.

The directors and officers are: President, H. C. Schofield, M.P.P.; Vice President and Managing Director, C. J. Laughlin, jr.; Secretary-Treasurer, H. Rooke; other directors, W. W. Near, W. W. Butler; Superintendent, T. F. Swayze.

A press report, Mar. 6, says that negotiations are in progress with an English firm for the building of the line, a short piece of which has already been built in Welland. (Mar., pg. 148.)

Nipissing Central Ry.—It is expected that work on the extension from Haileybury to New Liskeard, Ont., will be started before May 1. (Mar., pg. 148.)

Ottawa and Lake McGregor Ry.—The provisional directors named in the bill before parliament providing for the incorporation of a company with this title are: N. McK. Retallack, W. S. Mackenzie, J. C. Cote, Ottawa; G. Clement, Angers, Que.; J. A. Duquette, Perkin's Mills, Que. (Mar., pg. 148.)

Ottawa Electric Ry.—The city council and the O.E. Ry. have agreed that the Preston St. extension shall be built as soon as the street is prepared by the city; that the Bank St. line will be extended; and that a line will be built on Wellington St. from Bank St. to Mackenzie Ave. as soon as the Government gives the desired permission. Other proposed extensions are still under discussion. (Mar., pg. 148.)

Porcupine Rand Belt Electric Ry.—The provisional directors named in the application to the Ontario Legislature for the incorporation of a company with this title are:—S. F. Adalia, H. A. Rowland, F. Regan, W. H. Best, Toronto. It is proposed to build an electric railway from the eastern boundary of Ontario in McGarry tp. westerly and southerly to Ladner city, thence westerly to the headquarters of the Montreal River, and on to the eastern bank of the Mettagami River at Kenogamisse Lake, with branches. Authority is also asked to connect with the Temiskaming and Northern Ontario Ry., and any other railway that may be built through the country traversed. (Jan., pg. 39.)

Port Arthur and Fort William Electric Ry.—The taxpayers of Port Arthur, Ont., have passed bylaws authorizing the building of a second track on the Arthur St. line from Bay St. to Algoma St., and on Bay and Algoma Streets; to extend the street railway from Hill St. westerly along Dawson Road to Algonquin Ave., and to build a siding at the fair grounds.

In connection with the power asked for from the Ontario Legislature to build lines outside the city limits, we are officially advised that for several years there has been talk of extending the line into the townships of McIntyre and Oliver, and it is now desired to have power to do so when the proper time arrives.

The Manager of Public Utilities of Fort William, Ont., reporting as to the street railway, gave details of the work done during 1911. The total expenditure was $80,793.90, or, adding departmental and miscellaneous expenditures, $84,498.55, and deducting credits, $73,997.22. Four double truck, double end cars had been purchased at a cost of $28,101.19. The city now owns 12 double truck closed cars, one double truck single car, and two single truck cars. There are in the city 3.4 miles of double track and 6.2 miles of single track, altogether 13 miles of line calculated as single track. The total expenditure on construction has been $390,863.01, and the city has a balance of $37,136.99 of the $428,000 of debentures sold, unexpended.

Regina Municipal Ry.—A bylaw providing for the expenditure of $400,000 additional upon this line is under consideration by the Regina, Sask., city council. It has been decided that the work left uncompleted in 1911 shall be finished, and that a further six miles of track will be laid during the current year. (Jan., pg. 39.)

St. Thomas Street Ry.—The committee of the St. Thomas, Ont., city council having charge of the operation of the street railway has had the question of improving the lines under consideration. The committee is of opinion that the citizens would defeat any bylaw calling for any larger immediate expenditure than $20,000, and the City Engineer was directed to prepare estimates showing what could be done with that amount. (Mar., pg. 149.)

Sarnia Street Ry.—We are officially advised that the company proposes to build an extension to Lake Huron Park pavilion, Sarnia, Ont., owing to the increasing business to the park.

Plans are being prepared for a new car barn and machine shop. The building will be of concrete, with steel girders for roof and concrete. The building will be equipped with all the latest appliances, and will have accommodation for 20 double truck cars.

A contract has been placed for two new generators for the power house, which are expected to be set up early in April. (Mar., 1911, pg. 261.)

Saskatoon Electric Railway and Power Co.—The Saskatchewan Legislature has incorporated a company with this title to build an electric railway in Saskatoon, and also to take over an agreement made with H. M. E. Evans, of Edmonton, and the Saskatoon Power Co. The S.P. Co. is incorporated by chap. 154 of the statutes of Canada of 1907-08, and the bylaw of the city of Saskatoon adopting the agreement was approved, July 6, 1911. The Legislature also confirmed the agreement with the city council.

The Legislature inserted clauses in the act under which the company cannot transfer its charter and franchises without the consent of the city; nor extend its lines outside the city limits without the consent of the city, the municipality concerned, and the Lieut.-Governor-in-Council. (Jan., pg. 39.)

Sherbrooke Ry. and Power Co.—The power transmission line to Stanstead, Que., 32 miles, has been completed, and power was turned on Feb. 28. Press reports state that arrangements are being made for the building of an electric railway between Sherbrooke and Stanstead, and that the first section of the line to be built will be between Sherbrooke and North Hatley. (Jan., pg. 39.)

The Springhill Fruit Lands Co. is considering a proposition for the purchase of a storage battery electric car and the making of an arrangement for its operation over the St. John Valley Ry., when it is built, between Fredericton and Springhill, N.B., about five miles. F. deL. Clements, Springhill, N.B., is President.

Sudbury-Copper Cliff Electric Ry—The provisional directors named in the application to the Ontario Legislature for the incorporation of a company with this title to build the lines mentioned in our last issue are:—Jos. Bell, W. Cochrane, J. Mackey, D. M. Morin, L. Laforest, Sudbury, Ont. (Mar., pg. 149.)

Three Rivers Tramway Co.—Application is being made to the Quebec Legislature for the incorporation of a company with this title, to build a tramway to be operated by electricity in the city of Three Rivers, and in the surrounding parishes. The provisional directors are: R. Ryan, N. Lamy, F. A. Verette, J. F. Bellefeuille, O. Beauclacet, C. Bourgeoise, Three Rivers. The city council has passed a bylaw granting a franchise for the building of an electric line along certain streets in the city. The plans approved show lines covering the principal streets of the city, and extending to Ile St. Christophe, in the St. Maurice river. (See Three Rivers, Que., Jan., pg. 40.)

Toronto City.—The Toronto city council, Mar. 19, referred back for further consideration, a recommendation of the board of control to employ Ford, Bacon and Davies, New York, at a cost of $30,000 in addition to certain expenses, to make a report on a metropolitan system of street railways for the city. It was intended that the experts employed should report upon the civic car lines now being built, and also on the handling of the Toronto Ry. system when the franchise expires in 1921. (Mar., pg. 149.)

Toronto Suburban Ry.—Plans have been filed in the York county registry office for the extension of the line now terminating at Weston, Ont., to Woodbridge, 7.97 miles; for the extension of the line now terminating in Lambton Mills, to Islington, 2.54 miles, and from that point in the direction of Georgetown as far as mileage 15.12.

A deputation from Guelph waited on the management recently, and was informed by W. H. Moore that the company expected to have its line completed from Toronto to Guelph by the fall. It was not proposed to take over the People's Ry. scheme at Guelph, but the company would be prepared to aid the Guelph Radial Ry. in building a line out of Guelph north and south.

Representatives of the Stratford city council and of the Stratford Ry., who also interviewed the management, state that they were informed that it was desired to take over the Stratford charter, with a view of making it a centre for radial lines designed as feeders for the Canadian Northern Ry. lines in Western Ontario when built. Some further negotiations having taken place, A. Waddell, one of the directors of the S. Ry., is quoted as having stated, Mar. 4, that he was only waiting orders from Toronto to sign the transfer of the company's powers to the Mackenzie, Mann and Co. interests.

Work has been started on the construction of the extension of the line from Weston to Woodbridge, Ont., and the work will be pushed forward to completion as soon as the frost is out of the ground. The present line from Keele St., which is 4 ft. 10¾ ins. gauge, will be converted to standard 4 ft. 8½ ins.

On the proposed extension from Lambton to Guelph, right of way agents are out between Islington and Meadowvale, and it is expected that construction will be started soon.

Application is being made to the Ontario Legislature for authority to build an additional line from some point on the company's located line through Toronto tp., Peel county, to Brampton, thence easterly to a junction with the company's present line near the G.T.R. station at Davenport, Toronto. (Mar., pg. 149.)

Watrous Radial Ry.—The Saskatchewan Legislature has incorporated a company with this title to build an electric railway within the town of Watrous and into surrounding municipalities. N. B. Wilks, Watrous, is one of the provisional directors.

The Legislature has also authorized the Watrous town council to grant a franchise for a street railway within the town, and also to guarantee the bond of a company building such a railway.

Winnipeg Electric Ry.—We are officially advised that the company is negotiating under its Winnipeg, Selkirk and Lake Winnipeg Ry. charter, with the municipalities interested, for the building of a line to Stonewall and Stony Mountain, Man. It has not been decided from what point on the present line the new line will start, or what route will be followed. The new line will be about 20 miles long, and it is expected that construction will be started this year.

The company is applying to the Manitoba Legislature to amend its powers in several particulars.

The Winnipeg board of control passed a resolution Mar. 14, calling upon the company to construct about eight miles of new tracks this year.

Electric Railway Finance, Meetings, Etc

British Columbia Electric Ry.—Gross earnings for Jan., $517,247; working expenses, $313,408; net operating earnings, $203,839; renewal funds, $37,935; net earnings, $165,904; approximate income from investments, $25,000; net income, $190,904; against $368,754 gross earnings; $218,428 working expenses; $150,326 net operating earnings; $29,770 renewal funds; $120,556 net earnings; $20,000 approximate income from investments; $140,556 net income, for Jan., 1911. Aggregate gross earnings for seven months ended Jan. 31, $3,318,641; net earnings, $1,170,091, against $2,360,402 aggregate gross earnings; $970,452 net earnings, for same period 1910-11.

Calgary Municipal Ry.—Earnings for Feb., $37,366.75, against $19,383.21 for Feb., 1911.

Cape Breton Electric Co.—Gross earnings for Jan., $28,327.44; operating expenses, taxes, etc., $17,495.31; net earnings, $10,832.13; interest charges, $4,495.83; balance, $6,336.30; sinking and improvement funds, $1,140; balance, $5,196.30, against $27,442.73 gross earnings; $15,289.56 operating expenses and taxes; $12,153.17 net earnings; $4,152.50 interest charges; $7,640.67 balance; $1,141.67 sinking and improvement funds; $6,499 balance, for Jan., 1911.

Dominion Power and Transmission Co.—An action has been entered at Hamilton, Ont., by C. W. Moodie, and some other shareholders against the directors. The plaintiffs ask for damages for alleged breach of trust in procuring and permitting the acquisition by the company of its properties for a fraudulent and excessive consideration; an order to recover from the individual defendants and the company all profits made by defendants in connection with the acquisition by the company of its properties; an order to recover from them all fees as salaries received by them in excess of services rendered; a declaration that the stock of the company, issued in pursuance of the transactions complained of is not fully paid up; an injunction against the continuance or repetition of the alleged wrongful acts; an account in respect of the above matters and the appointment of a receiver. This action has been threatened for some time, the shareholders who are bringing it having complained that the directors withhold dividends on preferred stock and used them in connection with the company's business without interest.

Edmonton Radial Ry.—During Feb. the revenue was $25,101.92, and 613,351 passengers were carried. It is stated that when the report for the month is fully prepared, a conspicuous item will be the minimum amount of current used per car mile. The system of metering the current used by each car and offering a bonus for economy is expected to show its effect on the monthly power bill.

Grand Valley Ry.—The proceedings in the courts at Toronto for the appointment of a receiver for this company are stated to have arisen in respect of $125,000 of bonds issued on the Brantford St. Ry., prior to the amalgamation, and it is stated that this is the first step to the reconstruction of the company. A Brantford press report states that the present interests have secured sufficient capital to carry out the financial reconstruction of the company, and that there is no prospect of the Brantford St. Ry. being taken out of the G.V. Ry. control and taken over by the Brantford city council.

Hamilton Grimsby and Beamsville Ry.—Following are the officers and directors for the current year:—President, J. Dixon; Vice President, J. Dickenson; other directors, J. Moodie, W. C. Hawkins, J. V. Sutherland; Treasurer, J. Knox; Secretary, G. D. Fearman. It was reported at the annual meeting, Feb. 26, that the total earnings for the year 1911 were $121.000 and that about $37.000 was expended upon maintenance.

Montreal St. Ry.—Passenger earnings for Jan., $412,826.23; miscellaneous earnings, $5,135.70; total earnings, $417,961.93; operating expenses, $267,369.52; net earnings, $150,392.41; city percentage of earnings, $24,143.04; interest on bonds and loans, $15,959.84; rent of leased lines, $661.37; taxes, $5,000; total charges, $45,764.25; surplus, $104,828.16; expenses per cent of earnings, 63.97, against $363,147.35 passenger earnings; $6,997.25 miscellaneous earnings; $370,124.60 total earnings; $239,982.64 operating expenses; $130,141.96 net earnings; $18,352.08 city percentage of earnings; $15,495.86 interest on bonds and loans; $607.30 rent of leased lines; $4,700 taxes; $39,155.44 total charges; $90,986.52 surplus; 64.84 expenses per cent. of earnings for Jan., 1911; passenger earnings for Feb., $388,748.03; miscellaneous earnings, $5,247.44; total earnings, $393,995.47; operating expenses, $270,123.42; net earnings, $123,872.05; city percentage on earnings, $25,555.64; interest on bonds and loans, $15,724.04; rent leased lines, $661.37; taxes, $5,000; total charges, $46,941.05; surplus, $76,931; percentage of expenses to earnings, 68.56, against $326,628.34 passenger earnings; $4,109.33 miscellaneous earnings; $330,737.67 total earnings; $227,604.44 operating expenses; $103,133.23 net earnings; $21,024.29 city percentage of earnings; $15,642.58 interest on bonds and loans; $607.10 rent leased lines; $4,700 taxes; $41,973.97 total charges; $61,159.26 surplus; 68.82 percentage of expenses to earnings, for Feb., 1911. Aggregate total earnings for five months ended Feb. 29. $2,105,765.24; operating expenses, $1,298,599.44; net earnings, $807,165.80; total charges, $205,781.19; surplus, $601,384.61; percentage of earnings to expenses, 61.67, against $1,830,922.44 aggregate total earnings; $1,135,988.40 operating expenses; $694,934.04 net earnings; $182,782.64 total charges; $512,151.40 surplus; 62.04 percentage of expenses to earnings, for same period 1910-11.

Quebec Ry., Light and Power Co.—The directors have decided not to pay any further dividend on the common stock for the present, but to devote the surplus earnings to betterments and the creation of a surplus.

Regina Municipal Ry.—Passenger earnings for Jan., $5,154.95; miscellaneous earnings, $270; total earnings, $5,424.95; operating expenses, maintenance of way and structures, $736.41; rolling stock, $230.26; electrical equipment, $186.08; conducting transportation, $1,871.73; power, $1,025.25; general, $295.49; total, $4,345.22; net earnings, $1,079.73. Gross earnings per car mile, 26.746c; operating expenses per car mile, 21.423c; net earnings per car mile, 5.323c. Passengers carried, 114,067; cost of power per car mile, 5.054c.

Toronto Ry.—Gross earnings for Jan., $656,110; operating expenses, maintenance, etc., $326,672; net earnings, $329,438, against $590,418 gross earnings, $293,150 operating expenses, maintenance, etc.; $297,268 net earnings for Jan., 1911. Commencing with the foregoing figures for Jan., the company's return will cover the combined earnings, etc., of the Toronto Ry., Toronto and

York Radial Ry., Toronto Power Co., Toronto Electric Light Co., and the Electrical Development Co. of Ontario.

Winnipeg Electric Ry.—Gross earnings for Jan., $319,433; operating expenses, $175,412; net earnings, $144,021, against $346,144 gross earnings; $188,349 operating expenses; $157,795 net earnings for Jan., 1911.

Electric Railway Notes.

H. Doughty, Superintendent of the Regina Municipal Ry., resigned his position, Mar. 31.

The American Electric Railway Association's convention will be held in Chicago, Ill., Oct. 7 to 11.

The Regina city council has decided to order three additional cars for its electric railway, for delivery in Sept.

The Erie Rd. is reported to be about to electrify 208 miles of its New York suburban lines, at an estimated cost of $12,000,000.

The New Brunswick Public Utilities Commission has under consideration the fixing of rates for the Moncton Tramways, Electricity and Gas Co.

The Moose Jaw Electric Ry. has ordered three single end, semi-convertible, pay-as-you-enter car bodies, 31 ft. long over all, from the Ottawa Car Co.

The Toronto and York Radial Ry. has ordered five passenger cars and two express cars for its Metropolitan Division from the Preston Car and Coach Co.

J. B. Rannie, heretofore Traffic Superintendent, has been appointed Traffic Agent, British Columbia Electric Ry., Vancouver, and has been succeeded by Jas. Hilton.

Hon. L. P. Pelletier, Postmaster General, has resigned as director of the Quebec Ry., Light, Heat and Power Co., and has been replaced by Elsear Baillargeon, his nephew and legal associate.

The Halifax Electric Tramway Co., during 1911, added vestibules to both ends of 24 of its closed cars, at a cost of $2,500. It is purchasing for fall delivery four box cars, and for delivery by the summer of 1913, four open cars.

H. E. Grant, of the British Columbia Electric Ry. Co.'s light and power department, will read a paper on the education of central station employes, at the National Electric Light Association's convention at Seattle, Wash., in June.

The Ontario Legislature's private bills committee has struck out of a bill introduced in the interest of the town of North Toronto a clause which provided that no electric railway should transport freight on any highway in the town.

The Port Arthur and Fort William Electric Ry. has ordered two double end, semi-convertible, pay-as-you-enter car bodies 32 ft. long overall, and one double-end double truck semi-convertible pay-as-you-enter car body 33½ ft. long over all, from the Ottawa Car Co.

The Montreal Tramways Co. informed the Quebec Public Utilities Commission, Mar. 12, that all cars in the service had been equipped with emergency brakes, and all double truck cars were equipped with air brakes. The single truck cars were being got rid of at the rate of 50 a year, being replaced by 30 double truck P.A.Y.E. type cars.

The deal transferring the Algiers Ry. and Lighting Co.'s property to the Canadian syndicate that owns the New Orleans, Southern and Grand Isle Rd. was completed Mar. 1, and the property will pass to the New Orleans and Grand Isle Traction, Light and Power Co., incorporated in Ontario, Mar. 1, with a capital stock of $10,000,000. C. E. A. Carr, general manager, Algiers Ry. and Lighting Co. and New Orleans, Southern and Grand Isle Rd., and formerly of Quebec, says that no definite plan for the improvement on the property will be decided upon until it is formally transferred.

T. W. Casey, general manager, Prepayment Car Sales Company, New York, and formerly of Montreal, has returned from a trip through Europe in the interest of the International P-A-Y-E Tramcar Co., Ltd., of London, Eng. He reports a cordial reception among European electric railway officials and great interest in and willingness to discuss prepayment car operation as judged from the experience of the operation of this type of cars in the United States. The General Omnibus Co., of London, is changing some buses to prepayment operation. If these should prove practicable and successful a general conversion of all its buses is contemplated. The General Omnibus Co., of Paris, is also changing some of its buses operating between Paris and St. Germain to prepayment operation.

Gasoline Motor Car for Winnipeg City Power Railway.

The city of Winnipeg has bought a gasoline motor car for use on its railway between the C.P.R. station at Lac du Bonnet and the city power house at Point du Bois. The accompanying illustration of the exterior of the car shows its general features. It has a four-wheel steel frame truck with 10 ft. wheel base, standard gauge, and the total weight is about 22,000 lbs. Power is supplied by a heavy type four cylinder gasoline engine of special design, and with a conservative rating of 50 to 60 h.p. at 600 r.p.m. The transmission is of a gear type, and is so designed that there is no possibility of gear trouble in changing from one speed to another. There are three speeds in each direction, and two chains transmit the power from the gear box to the front pair of wheels. The maximum speed so far obtained is 42 miles an hour, but on good track this can be considerably increased. With this car the travelling time between Lac du Bonnet and Point du Bois has been decreased from one hour and a half (the schedule time of steam train) to 55 minutes, the present schedule. The gasoline consumption is from 7 to 8 miles per gallon. The car has hauled with ease a loaded 40-ton freight car, and has taken a 5% grade ¾ of a mile long on the high gear. There is seating capacity for 35 people, the body being divided into two compartments, the rear having reversible seats upholstered in rattan, and the forward containing engine and having ample room for light baggage and express. The forward compartment may also be used as a smoking compartment, as it is provided with drop seats. Steam heat is supplied from a small boiler at the front end of the car. Westinghouse straight air equipment is provided. The car was supplied by the Canadian Fairbanks-Morse Co., Ltd.

Gasoline Motor Car for Winnipeg City Power Plant.

Telegraph Lines in Canada.

In moving recently in the House of Commons for the appointment of a commission to investigate the systems of telegraph, etc., in Canada, with a view to submitting such data to the Post Office Department, J. E. Armstrong, M.P. for East Lambton, Ont., quoted the following figures relating to the operation and equipment of various telegraph companies in the year 1910-11:

The Dominion Government owns 8,406 miles of telegraph line and cables, 8,150 miles being land lines. There are 603 offices and 249,915 messages were sent in the year. The expenditure was $432,970.04, and the revenue $169,585.15, a deficit of $263,384.89.

The C.P.R. Telegraphs operated 12,257 miles of telegraph line, with 76,175 miles of wire, sending 3,431,493 messages. It has 1,372 offices.

The Great North Western Telegraph Co. operated 11,234 miles of pole lines, with 50,092 miles of wire, sending 2,907,495 messages, and has 1,183 offices.

The Western Union Telegraph Co. had 2,639 miles of pole lines with 11,024 miles of wire, sending 551,764 messages, with 217 offices.

The North American Telegraph Co. operated 605 miles of line, with 783 miles of wire, and sent 38,015 messages, with 83 offices.

The Grand Trunk Pacific Ry. operated 1,699 miles of pole lines, with 5,081 miles of wire, sending 71,154 messages, with 73 offices.

The Algoma Central Ry. had 130 miles of line, 174 miles of wire, and sent 3,639 messages with four offices.

The Temiskaming and Northern Ontario Ry. had 265 miles of pole line and 1,865 miles of wire, sending 131,106 messages with 22 offices.

The total mileage of pole line owned by all the companies in Canada was 28,729, and the line mileage operated by telegraph, telephone and cable companies was 145,997. Messages taken and delivered over all these lines, not including press messages, 7,134,665, and total number of offices 2,934.

Canadian Street Railway Association.

PRESIDENT, James Anderson, General Manager, Sandwich, Windsor and Amherstburg Ry.; VICE PRESIDENT, P. Dubee, Secretary Montreal Tramways Co.; SECRETARY-TREASURER, Acton Burrows, Managing Director, The Railway and Marine World.

ASSOCIATION'S OFFICE, 70 Bond St., Toronto.

EXECUTIVE COMMITTEE.—E. P. Coleman, Manager of Railways, Dominion Power and Transmission Co.; H. M. Hopper, General Manager, St. John Ry.; J. E. Hutcheson, Superintendent, Ottawa Electric Ry.; C. B. King, Manager, London St. Ry.; D. McDonald, General Manager, Montreal Tramways Co.; M. N. Todd, President, Galt, Preston and Hespeler St. Ry.

ASSISTANT SECRETARY, Aubrey Acton Burrows, Secretary and Business Manager, The Railway and Marine World.

OFFICIAL ORGAN, THE RAILWAY AND MARINE WORLD.

Marine Department

Fuel Oil and Its Installation on the G. T. P. Steamships Prince Rupert and Prince George.

By C. H. Nicholson, Manager, Grand Trunk Pacific Ry. Steamhips.

The adoption of oil as fuel for steamships' use is a question which involves the careful study and solution of many problems peculiar to each individual case. Some of these are:—The advantages to be gained in economy and efficiency; the abundance of the supply, means of securing proper delivery, storage facilities and convenience in fueling ships; quantities required to be carried, location of proper storage on board, ships' trim and stability, fresh water storage, etc.; and, not the least important, the system of oil burners to be adopted.

The advantages gained in the use of oil as fuel as against coal vary according to the conditions under which it is to be used, and are generally well recognized. Briefly enumerated, they are as follows: The quantity required to perform the same service is less both in weight and the space occupied, with a proportionate decrease in fuel bills. This is particularly true on the Pacific coast, where the oil supply is abundant, and coal is somewhat limited in quantity, high in price, and of comparatively poor fuel value. Such expenses as renewing of grate bars, stoke hold floor plates, slice bars, rakes, etc., which every coast engineer knows are considerable, are done away with.

It has been the experience also of ship owners who have changed from coal to oil that charges for boiler maintenance have practically disappeared. The constant opening of furnace doors for firing up, and the time required to clean fires on account of the large amount of ashes and clinkers, with the consequent inrush of cold air, and the resultant lowering of furnace temperature, cause an immense amount of contraction and expansion. This cannot but have a serious effect on joints and rivets, and as a consequence a large unnecessary expense for repairs, to say nothing of the rapid deterioration of the plant, with the ultimate necessity of replacing the boilers long before their time. I have known ships to carry a gang of boilermakers trip after trip, and when laid off for overhaul the principal expense would be boiler repairs. One superintendent engineer whose fleet made long off-shore voyages, told me it used to be a regular thing to have boilermakers waiting a ship's arrival in port, but since his line adopted oil fuel he "had not seen a boilermaker."

Another most important economy is the reduction in the number of firemen and trimmers required, with the consequent lowering in payroll and cost of subsistence. One man of ordinary intelligence on a watch, in oil burning ships with single stoke holds, will tend 18 fires and have an easy time of it, whereas with coal 18 firemen and six to nine trimmers would constitute the stoke hold crew of such a ship, and they would earn their money, too. The difficulty of securing so large a crew of efficient firemen is very often a serious one. This is greatly lessened with oil, as its use does not require nearly so many nor any more skilful men, and the cleanliness and lightness of the work appeals to them. Crews are easier to keep and are more useful on that account.

Because of the absence of smoke, cinders and coal dust, oil burning ships are not only cleaner, but the supplies required for scrubbing and painting are much less, and while the economies from such sources are difficult to calculate, they are appreciable nevertheless.

In point of efficiency the advantages are quite as marked. The calorific value of oil far exceeds that of coal. After deducting the percentage of moisture and ash from coal, the latter from experience having been found to run as high as 20% and 25%, the average run of coal will be found to represent 7,000 to 9,500 b.t.u., whereas oil will give as high as 18,500 b.t.u. The combustion of coal is most incomplete with very high stack temperatures, while with oil combustion it is practically perfect, and stack temperatures of from 400° to 450° F. are easily obtained. Boiler efficiency (under coal usually about 57%) is in consequence increased to

P203 C. H. Nicholson,
Manager, Grand Trunk Pacific Ry. Steamships.

something over 80%, especially where forced draft installations are found. The water evaporation is thereby increased. Instead of an evaporation of from 7 to 9 lbs. of water per pound of fuel with coal, from 15 to 16 lbs. of water per pound of fuel is secured with oil. The steam pressure is steady and easily obtained, a given speed is readily maintained, thereby adding greatly to the accuracy of dead reckoning, the safety of the ship and those travelling on her, as well as their comfort and convenience. When all these things are considered there seems little argument left in favor of coal as against oil, except the supply.

While it is difficult to calculate definitely the future oil supply, still there are no present indications of failure in this direction. It was reported a few months ago that there was in storage in California alone a quantity sufficient to take care of the world's consumption for seven months. The California and Texas oil fields are by no means exhausted new wells are being sunk constantly, and from indications in Alaska, Alberta and South America, other fields will be developed equally as important, so that notwithstanding the immense increase in consumption, the supply promises to be adequate, and the price will probably go lower rather than higher.

Fueling facilities are becoming more adequate, and ships may now take oil at all California ports, Portland, Ore., Tacoma and Seattle, Wash., and Vancouver, B.C. In a few instances oil barges are kept and will come alongside and fuel a vessel up while at her own pier, but in most cases it is necessary to proceed to a shore station for oil, at the expense of moving the ship and the loss of time entailed. For our own purposes, where a rigid schedule is maintained and time is a most important factor, it is desirable that the ships may be fueled, watered, freighted, and take on or discharge passengers, baggage and mails at one and the same time without requiring the ships to move from their berths. This has been accomplished by the erection on the new Grand Trunk Pacific dock, Vancouver, of an oil storage tank holding 32,000 bbls., a measuring tank holding about 1,000 bbls., and a pumping plant of 1,000 bbls. per hour delivery. An 8-in. pipe line leading down the dock, with two connections to the ship, enables both forward and after tanks to be filled at the same time. A contract has been made which calls for a constant supply of oil, having the required flash test and gravity. The pump house is of concrete, and the tanks stand on heavy concrete foundations laid on piles driven to 3 ft. centres, with retaining walls of reinforced concrete. The walls themselves form an outside tank with a capacity 10% greater than the steel tanks, and are circular in shape, with panels set in, making them more ornamental than otherwise. By the plan the rate of insurance on our own and surrounding property is not effected, and the maximum degree of safety from leaks or fire is obtained.

Individual requirements must govern the quantities required to be carried. The route the vessel is on and the frequency with which she can be fueled are to be considered. A handy rule is the i.h.p. developed, divided by 10, which will give the consumption in barrels per steaming day of 24 hours, or, generally speaking, 4 bbls. of oil will equal one ton of good coal, although on vessels with modern and well maintained equipment, 3½ bbls. will be nearer the actual consumption, including the usual auxilaries.

The location of oil storage on board is perhaps a more difficult problem. Double bottoms are frequently used in ships where they are required for water ballast only. The principal difficulties in such cases are those of proper venting arrangements, and owing to the low temperature of the sea water, and the density and low viscosity of oils required to stand British Admiralty and Dominion Government tests, it will be found necessary to fit steam heater coils to the suction pipes to secure a free and constant flow to the pumps. Such coils, from their location, are difficult to over-

haul, and are attended with the possibility of developing leaks and the consequent introduction of water into the oil.

In high speed vessels like the Prince Rupert and Prince George, questions of displacement, trim, stability and centres of gravity are very carefully worked out by the designer and builders, and it is most important that such conditions once established should not be disturbed. These being the only ships on the Pacific coast fitted with full hot and cold running water service in all staterooms they require far more than the average supply of fresh water. The double bottoms being utilized for this purpose, it became obvious if fuel oil was to be carried there that an equal amount of water storage must be provided elsewhere. It was decided that oil tanks built in the regular bunker spaces would create the least disturbance to the domestic and boiler feed water systems of the ships, the distribution of weights and other questions of trim and stability. Besides this the plan possessed the additional advantage of convenience in filling and venting arrangements without disfiguring the vessels' cabins or exteriors, and such tanks being located above the ships main tank tops no suction heaters were necessary. The space provided contains sufficient to carry the ships a round trip (about 1,700 nautical miles) at 18 knots an hour, with ample for port consumption.

These tanks, five in number, are built of heavy steel, and are well provided with fore and aft and 'thwart ship bulkheads to prevent swashing. In addition to the usual flanged fittings required by law, full sized gate valves have been provided on the inside of pipe openings, operated by spindles from the top of the tanks, which permits closing any pipe line in case of a break, and absolutely confining the oil to the tanks. The tank plans were approved by Lloyd's, the British Board of Trade, and Dominion steamboat inspectors before the contracts were let.

The filling arrangements are most complete and simple. The forward and after tanks can be filled separately, but in addition, the after filling pipe leads to an 8-in. manifold, by which not only can the filling of any tank be controlled, but being connected with the pumping system, any tank can be filled from any other or discharged overboard if necessary. This brings all working valves in one place and constantly under observation.

Lastly, on the system of burners adopted depends the entire efficiency of the plant, and to a large extent the economy to be obtained. As is well known, there are three methods of atomizing fuel oil employed, viz., by the use of compressed air, steam, or by mechanical process. The first entails considerable initial expense for compressors, etc., and the cost of operation; the second, while not so costly to install, uses a large amount of live steam, which is unreclaimed, and a consequent drain on the fresh water supply, and in addition, the roaring of the burners is disagreeable and a nuisance. The third, or mechanical system, consists of heating the oil to a high temperature, and putting it under pressure, from which, when escaping at the burners it bursts into a vapor and readily ignites. It is practically noiseless. After carefully considering all methods with the idea of procuring the very best, the mechanical atomizing system was decided upon as cheapest to operate and most efficient.

The particular system adopted after thorough investigation is not only very simple, but less costly to install than some others, and particularly well adapted to the forced draft, with which these ships are fitted. It consists of three specially designed heaters tested to 700 lbs. pressure, which can be used singly or in series, two being sufficient to carry the ship working under full power, the third being held in reserve. Pumps, strainers, etc., are in duplicate, one of each to be held in reserve for emergencies, thermometers, oil meter, fire brick quarl and adjustable metallic cone for regulating the supply of air. The burners are very simple as to design and arrangement for changing or cleaning. A burner can be taken out and changed in five seconds, and has various sized tips which can be changed as required, for increasing or diminishing the consumption. During a visit by the writer to San Francisco to inspect this system, a practical test was made, using a Scotch marine boiler with forced draft, an accurate record of stack and feed water temperatures were taken, and the quantities of fuel and water used were carefully computed. Very satisfactory results were obtained both as to evaporation and fuel consumption.

The contract for the tanks and for installation was given the B.C. Marine Railways, Ltd., at Esquimalt, B.C., and the s.s. Prince George was retired from service for the purpose of making the change, in Nov., 1911. Some delay was experienced in assembling the material, but the vessel went into service again March 3, relieving the s.s. Prince Rupert, which will be similarly changed and ready for service about April 15.

Much study and care has been given this installation in arranging the plans and working out the details, and it is considered the best and most complete yet made on this coast, this opinion being borne out by other steamship and oil men who have seen the work being done. It is confidently expected that when these ships are again in service, not only will the desired economy and increased efficiency be affected, but many improvements will be found possible under the new conditions, not the least of which will be clean and white painted stoke holds, smokeless stacks, and sootless decks, the latter features being a consummation devoutly to be wished, and which will be much appreciated by the travelling public.

Changes Suggested in Examinations for Masters' and Mates' Certificates for Inland Waters

The Dominion Marine Association adopted the following resolution at its annual meeting last year:—

"That the present system of examining candidates for masters' or mates' certificates is very unsatisfactory, and that the uncertainties and irregularities due to the discretionary powers now vested in individual examiners should be eliminated, and that in the opinion of this Association it would be advisable to have examinations conducted only at stated times and at stated places, and by at least two examiners present at the same time; and that the examination papers should be printed as required at Ottawa and sent sealed to the examiners; to be opened at the times and places specified, in the presence of the candidates; and that the written answers should be submitted to headquarters for judgment."

This resolution was re-affirmed at the Association's recent annual meeting and was personally urged on the Minister of Marine and Fisheries at that time by the Association's Counsel, F. King. While the matter was being presented, two points were emphasized in accordance with information received, which appeared during the discussion which ensued to have been either inaccurate or misunderstood. These were, first, that it was objectionable to have examiners paid by fees, and, secondly, that it was objectionable to have individual examiners pass upon the papers of candidates. The answer suggested by the Deputy Minister that the fees are remitted to Ottawa does not entirely dispose of the first objection, as it is still considered inadvisable that the examiners should deal with the fees in any way. It is said that in the case of certain examiners, candidates are referred to tutors, who for a consideration will coach a candidate for a few days prior to the examination. In this and in other ways there is room for dissatisfaction with the present system, so long as there are individual permanent examiners with discretionary powers of any kind. With regard to the second point, and the suggestion made by the Deputy Minister that the papers are passed upon in Ottawa rather than by the individual examiner, explanation was made during the interview to the effect that the Association's objection was largely aimed at the exercise of discretionary powers by the individual examiner in the oral part of the examination which it was admitted was dealt with exclusively by the individual examiner, and that in the second place it is not strictly correct to say that the candidates' answers are passed upon in Ottawa, the fact being, it appears, that the individual examiner makes a report upon the examination, which report is the subject of consideration at Ottawa, the views of the individual examiner receiving considerable weight in this manner.

The suggestion embodied in the above resolution seems one which is not open to serious objection, and would at least remove from the field of discussion the various items of dissatisfaction which have given rise to a fairly unanimous impression among vessel owners that the examinations are not conducted just as they should be.

It has been suggested that if the Department could devise some method of establishing or assisting schools for the instruction of candidates in some of the principal ports on the lakes, it would improve the situation a great deal and prevent the shortage of available material in the way of masters and mates which sometimes threatens when too many of the best men seek employment in the larger field and better paid positions on the United States side of these waters.

The further suggestion has been made and very special attention is called to it, that examiners for certificates on the inland waters do not necessarily require to be men of salt water experience. The conditions on the lakes are very different from those on the ocean, and a master's duties are largely the duties of a pilot so far as navigating his ship is concerned. Examinations for the lake and river trade should, therefore, be confined to questions which relate exclusively to the requirements of navigation in these waters.

Handling Vessel Lines at Canal Entrances.

On the Dominion Marine Association's urgent requests from time to time men have been provided by the Department of Railways and Canals at certain lock entrances on the St. Lawrence canals to receive and handle the lines of approaching vessels. Some time since the Association requested that men be provided at the entrances of all the St. Lawrence canals, at lock 4 in the Soulanges canal and at Cote St. Paul in the Lachine canal, but this request was not acceded to. It has now been repeated by the Association and it is most important that the request be granted. It is often difficult for a vessel to make a landing and get a man ashore for the purpose of handling the lines, and this is particularly difficult under adverse conditions of wind and current. More than one life has been lost in the efforts to get a line ashore, and that in the interests of the safety of vessels and of lock entrances, provision should be made for men to handle lines at all the points mentioned.

Important Official Ruling on the Coastwise Passenger Trade.

The United States Attorney General, G. W. Wickerham, has given an opinion on the subject of the coastwise passenger trade which is of great importance to Canadian vessel owners and which confirms in every particular the argument presented to the U.S. Department of Commerce and Labor by the Dominion Marine Association's counsel, F. King, when the first trouble arose in August, 1911, and which he renewed at Washington in December before Acting Secretary Cable and the Commissioner of Navigation. Subsequently, at the request of the Department of Commerce and Labor, Mr. King put his views in a brief, which was forwarded to the Attorney General, and he has since received letters from the Department of Commerce and Labor stating that the position its officials took last August, and which threatened to interfere very seriously with international passenger travel all along the border, will be reconsidered and that, unless Congress makes some change in the law, the future treatment of the matter by the department and by collectors of customs will be governed by the Attorney General's opinion. Mr. King has also been informed that in view of the Attorney General's opinion bill 20626 introduced in the U.S. House of Representatives in the interest of Pacific coast lines will be withdrawn and that they will not attempt any modification of the present law. It was proposed to exempt the Great Lakes and St. Lawrence River from the operation of the bill, but the present news will be gratifying all the same, particularly to British Columbia coast vessel owners. As the Attorney General's opinion referred to is of great importance we give it in full as follows: It is addressed to the Secretary of Commerce and Labor, under date of Feb. 12.

"I have had under consideration your letter of Dec. 27, 1911, in which you say that in the course of the administration and enforcement of the coastwise shipping laws of the U.S. your Department finds it necessary, prior to the opening of navigation on the St. Lawrence River and the Great Lakes during the coming season, to deal with a situation brought to its attention toward the close of the season last past, and to issue appropriate instructions to collectors of customs and other officers concerned.

"Your letter states that 'a custom has grown up within recent years on the St. Lawrence River and the Great Lakes, whereby foreign vessels of Canadian ownership have been permitted to take on passengers at U.S. ports to transport them on excursions through domestic and foreign waters, returning them to the port of departure. Sometimes these vessels clear from the American port for a Canadian port, in which case the vessel usually makes a call at the latter port long enough to obtain clearance therefrom for the former. When such calls are made at a Canadian port, the passengers are in some cases permitted to land for a short time, and in other cases no such opportunity to land is afforded; but in either case the voyage is practically continuous and the passengers virtually remain with the vessel until her return to the port of departure in the U.S. The traffic in question is essentially domestic, since it originates and terminates in the U.S., and is supported by the American public, and is only foreign in so far as it passes through foreign ports or waters and is permitted to move in foreign vessels.'

"Upon this state of facts you request my opinion—'whether the transportation by foreign vessels of passengers taken on board in the U.S. under the circumstances mentioned constitutes a violation of sec. 8 of the Act of June 19, 1886, as amended by sec. 2 of the Act of Feb. 17, 1898.'

"The amended statute provides: 'Sec. 8. No foreign vessel shall transport passengers between ports or places in the U.S., either directly or by way of a foreign port, under a penalty of $200 for each passenger so transported and landed.'

"The legislative history of this statute is set out in the opinion rendered you under date of Feb. 26, 1910, in the case of the Cleveland, and need not be repeated.

"It is manifest that the passenger transportation referred to by you—excursions from U.S. ports through domestic and foreign waters, sometimes touching at a foreign port, but returning to the port of departure—does not come within the terms of the statute, which deals only with transportation 'between ports or places in the United States, either directly or by way of a foreign port.' These words imply a transportation beginning at one port or place in the U.S. and ending at another port or place therein. So, too, the clause imposing a penalty of $200 for 'each passenger so transported and landed' implies landing at the port or place of destination.

"You state, however, that 'the traffic in question is essentially domestic, since it originates and terminates in the U.S., and is supported by the American public, and is only foreign in so far as it passes through foreign ports or waters and is permitted to move in foreign vessels.' But this is not sufficient to bring the transportation referred to within the Act. I know of no authoritative rule of construction which will permit a penal statute to be construed to cover cases not within its terms simply because it may be identical, or substantially identical, in principle with those embraced in the Act. The remarks of Mr. Justice Story in Taber et al vs. United States, where it was held that a whaling voyage was not a foreign voyage within the meaning of the statute, are very appropriate in this connection: 'And it is not decisive in a case of this nature, that the mischiefs to be guarded against and remedied by the Act of 1803, are equally as applicable to whaling voyages, as to voyages to foreign ports for the general purposes of trade. Where a penalty, or a provision in the nature of a penalty, is to be enforced, the general rule is, that the statute is to be construed strictly; and the language is not to be enlarged to cover a case standing upon similar grounds, if the ordinary interpretation of the terms would not reach it.'

"In the recent case of the United States vs. Baltimore and Ohio Southwestern Rd., the appropriate rules of statutory construction are thus sufficiently stated by Mr. Justice McKenna, in delivering the opinion of the Supreme Court: 'If, however, there be no ambiguity, the words of the statute are the measure of its meaning. If there be ambiguity, the character of the statute determines for a strict or liberal construction. A criminal statute is strictly construed. Courts are not inclined to make constructive crimes.'

"In the case before me, I am unable to perceive any ambiguity in the statute; certainly none which warrants the construction suggested by the statement that 'the traffic in question is essentially domestic, since it originates and terminates in the U.S., and is supported by the American public.' The answer to this suggestion is that Congress in the statute in question was not dealing with that particular kind of traffic, even if it may properly be classed as domestic, but with transportation of passengers 'between ports or places in the U.S., either directly or by way of a foreign port.' In other words, it was legislating with respect to what is generally termed coastwise traffic, whereas the transportation referred to by you is not coastwise, but outward, into foreign waters or to a foreign port. I am unable to perceive how the fact that passengers so transported are returned to the port of departure in the U.S. bring the case within the statute.

"In the case of the Cleveland supra, it was held that a tourist voyage around the world on a foreign steamship, the passengers embarking at New York and landing ultimately at San Francisco, was not within the Act in question. It was said in that connection that the return of the passengers to the port in California was a mere incident of the object of the voyage, and, so far as the nature of the commerce was concerned, 'precisely the same as if, after a voyage to Japan, they had been returned over the same route and relanded in New York'—the very case now presented and which was there considered as clearly not within the statute. In the case of Cleveland, the transportation came within the letter of the statute, since the tourists were actually transported from one port in the U.S. to another port therein, via a foreign port or ports. But that case was held not to be within the spirit of the statute, because the real object of the voyage was the trip around the world. In the present case the transportation referred to—from a domestic port to a foreign port or into foreign waters, and return—is, in my judgment, neither within the letter nor the spirit of the law."

Specifications of Steel Hopper Scows.

The following are the principal particulars of two steel hopper scows of 150 yards capacity each, for which the Dominion Department of Public Works received tenders to March 11:—Length of hull, inside of fenders, 75 ft.; beam, moulded, 26½ ft.; depth, moulded, 8¼ ft.; length of each hopper, 16 ft.; breadth of each hopper at top, 18½ ft.; breadth of each hopper at bottom, 8 ft. They are intended for use at Pictou, N.S., and are to be delivered there.

They are to have steel hull and wooden doors, fender strakes and hopper linings, to have three hoppers or pockets each, four watertight bulkheads, rounded bilges and the bottom at ends is to be carried up to deck in a circle. The material to be open hearth steel, ship quality, tested at the mill in accordance with English Lloyd's rules. Rivets to be of steel, soft and ductile, and must stand the usual Lloyd's tests.

The scantlings of the hull will be as follows: side frames, 3½ ins. x 3 ins. x 7.9 lbs.; angles, spaces, 24 in. centres; end frames, same size angles, spaced, 24 in. centres; deck beams, 4 ins. by 3 ft. by 8.5 lbs; angles, floors, 5 1-16 ins. by 3 5-16 ins. by 13.9 lbs.; Z bars. The shellplating, duckplating and hopper plating all to be 12.5 lbs., excepting the bilge end plates, which will be 15 lbs. The bows from frames 3 and 35 to ends and all around ends a 12.5 lbs. reinforced plate will be fitted outside of shell plating, forming a pocket between it and shell, and this pocket will be filled with cement. There will be two doors to each pocket, made of 8 in. thick maple. Hinges will be solid, without links. Doors tight enough to hold the finest sand without leakage.

On each hopper will be fitted on alternate sides a modern hand lifting mechanism so as to close the doors, wind up chains 1¼ in. and door bridles 1 in. The scows will be provided with anchor davit, anchor, chain, ladders, double headed towposts, checks, etc., and with improved chainhoist.

Earlier Opening and Continuous Operation of the St. Lawrence.

Among the things brought before the Minister of Railways and Canals during the Dominion Marine Association's annual meeting in Ottawa recently was the necessity for an earlier opening of the St. Lawrence canals and also their continuous operation during the season. It was urged that the special circumstances this year render it much more desirable than usual that the St. Lawrence canals be open for navigation at the earliest date at which cargoes can come down and get through the Welland canal. It was pointed out that heretofore the Department has reserved practically the whole of April for making repairs in the lower canals, and that while navigation may open as early as April 15, 20 or 25, vessels are debarred from entrance into Montreal harbor from the west until May 1. This year there are some 6,000,000 bush. of grain already afloat at Canadian Lake Superior ports waiting for the opening of navigation. Ice breakers have been used at Fort William to bring boats alongside of elevators for loading, in order to relieve the elevators and have the cargoes ready on board. If navigation at Sault Ste. Marie and the St. Mary's River happens to be open shortly after the middle of April, it will cause great hardship and inconvenience if the St. Lawrence canals are not ready for navigation at a suitable date immediately thereafter. It was urgently recommended that provision be made this year for opening these canals at the earliest date possible, having regard to the time at which boats may pass through the St. Mary's river.

It was also urged that the closing of the Welland and St. Lawrence canals for part of every Sunday during part of the season of navigation constitutes a very grave difficulty and hindrance to navigation, placing the Canadian route under a serious handicap with reference to United States competition, and rendering it very difficult indeed for most of the lines to live up to any kind of schedule time. It was pointed out that Sault Ste. Marie canal was opened continuously in order to meet the competition of the adjoining U.S. canal. It was also shown that the tolls were removed from this canal for the same reason that for years tolls were charged lower down on the route, while none were charged at Sault Ste. Marie. In 1903 this anomalous condition was changed and the canals to tide water were rendered as free as the ocean. It was urged on behalf of the association that the arguments which prevailed at that time applied with equal force to the present petition. Attention was called to the serious handicaps under which the St. Lawrence route already labors. A vessel pays 8% upon the insurable value of her hull to reach Montreal harbor, a substantial part of this being imposed for the extra risks of the upper St. Lawrence River. Montreal harbor facilities are such that one can find in them a large part of the reason for the export of Canadian grain via Buffalo. Last season lake freighters were so seriously delayed in Montreal harbor through lack of room in the elevator, which was being used for storage rather than for transhipping purposes, that some owners preferred to charter elsewhere whenever possible. It was submitted that the imposition of the further handicap in the way of closed canals was extremely discouraging.

It was pointed out that the canals are now open from and after the first or second Sunday in September in each year to accommodate the fal ltraffic, and that they remain open practically until daylight and after dark on Sundays throughout the whole year. It was, therefore, argued that so far as the principle of Sunday observance is concerned consistency might call for continuous opening or for complete closure from midnight to midnight throughout the year.

In answer to the suggestion that the Lord's Day Alliance were the objecting parties, it was stated that the effect of the present system is simply to tie vessels up at some point along the canal or river bank with no corresponding advantages whatever to the crews. It is understood that the Lord's Day Alliance has based its recent arguments strictly upon a claim for the consideration of employes being entitled to one day off in the seven. It is submitted that the crew of a vessel thus tied up have to do extra work at night in consequence and gain no special advantage. It is also a question whether they have to work much harder while a vessel is canalling than when she is tied up. As to the lock men, canals are now electrically operated and little or no labor is involved in putting a vessel through. The circumstances in any event justify employment of extra men or provision for extra pay.

It was pointed out that the Lord's Day Act itself contemplates the very thing for which the Association is asking. For instance, sec. 3, sub-sec. (h) provides for the continuance to their destination of trains and vessels in transit when the Lord's Day begins and for work incidental thereto. Sub-sec. (g) provides for the conveying of travelers and work incidental thereto. It is submitted that under these and other sub-sections such vessels should enjoy the same freedom as passenger trains and that similarly freight boats should enjoy the same freedom as freight trains.

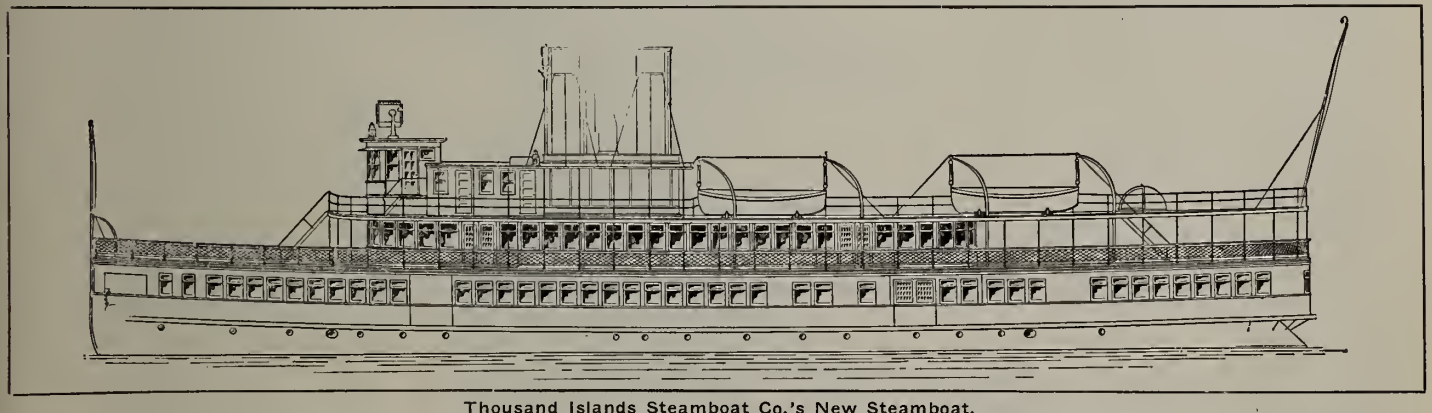
It was urged that the closing of the canals during certain hours on Sundays leads to violation of the rules and undue risks in the effort to race a boat through and prevent her being tied up. There were instances last year of racing such as this which were condemned by the Canadian Lake Protective Association.

It was also urged that under the conditions which have prevailed for the last year or two, great inconvenience has been occasioned in the Department, as well as to vessel owners, when necessity has arisen for the making of urgent pleas that the canals should be open on certain Sundays to relieve the congestion of traffic due to accidents or other special conditions. All this would be obviated if the Association's request were granted.

The Association's counsel, F. King, has received the Minister's promise that he will make every effort to facilitate an early, and, if possible, a continuous operation of the canals during the season.

Thousand Island Steamboat Co's New Vessel.

The steel passenger steamboat, which is being built at Toledo, Ohio, for the Thousand Islands Steamboat Co., which has its headquarters at Kingston, Ont., is illustrated on this page. She will be 172½ ft. long over all, 32 ft. beam moulded, and 9½ ft. deep from top of deck beams at side of hull to base line. Her draught will be about 6½ ft. She will be of the observation type, with the dining room on the main deck aft, the cabin upon the promenade deck, and the hurricane deck also available for passengers. Her appointments will be modern and adapted for the regular and excursion traffic in connection with the New York Central Rd., via Clayton, N.Y., and with capacity for 1,000 passengers. She will be equipped with twin screw propellers driven by two compound engines, cylinders 15 and 30 by 20 ins., 210 revolutions a minute. The engines will develop 1,000 h.p., 500 h.p. each. There will be one independent jet condenser; two Scotch boilers 12½ ft. diameter, 10½ ft. long, 1,240 horse power; four 45 in. inside diameter furnaces; allowed 150 lbs. steam; 3,246 ft. heating surface, 82½ sq. ft. grate surface. Hot air forced draft to insure best known economy. She will be equipped with a powerful searchlight for service in evening trips among the Islands, and her speed will be about 18 miles an hour. She is expected to be placed in service early in June. She will have capacity for 1,000 passengers.



Thousand Islands Steamboat Co.'s New Steamboat.

The company offered a prize of $25 for the most appropriate name for the new boat, the replies to be mailed by April 1, it being stipulated that the name be suggestive of the route and the territory to be served.

During Jan., one fatal and five non-fatal accidents were reported in connection with the navigation of Canadian waters. The fatality was the result of a fall.

Grand Trunk Pacific Steamships Dock at Vancouver.

Shortly after the advent of the G.T.P. steamships on the Pacific coast the officials realized the importance of securing terminals of their own in such an important centre as Vancouver, and after considering a number of propositions, finally decided, in the latter part of 1910, on the old Albion Iron Works site and foreshore facing it, on which they held an option. This property, before its acquisition by the G.T.P.R., presented the usual uninteresting and dilapidated, not to say disreputable appearance generally associated with discarded and early pioneer buildings. This the new owners soon started to demolish and improve, with the result that today at the foot of Main St. is to be seen one of the most modern and convenient docks on the Pacific coast. The work has been ably carried on under the supervision of Capt. C. H. Nicholson, Manager of G.T.P. Steamship Co., and F. T. Lucas, Resident Engineer of the company, and it is expected that operations will continue until another cargo pier is built for oceangoing steamships of the largest type at the eastern end of the property and a handsome terminal building is erected on the site facing Main St. The water terminals are at the foot of one of the main thoroughfares and in the centre of the city's population and business district, adjacent to the North Vancouver ferry.

The facilities afforded the travelling public and shipping merchants at this new wharf will be excellent. Passengers will be enabled to reach the steamships from the sidewalk of the main street of the city by a wide, covered overhead walk, electrically lighted, extending over the railway tracks along the approach to the pier into a commodious waiting-room, and thence over the warehouse to the passenger landing stages, which are reached by easy inclined approaches from the overhead walk and carried on pontoons, designed to be always at the same level as the boat's gangway. Passengers are therefore afforded the comfort of a clear dry approach from the street to the ship's deck, without the annoyance and interruptions of vehicular and rail traffic, also being entirely devoid of the dangers of grade railway crossings. The principal entrance to the dock for vehicles and drays is by the Gore Ave. crossing, and there is also a private entrance from Alexander St., a little west of Main St.

Off the waiting-room are the general offices of the G.T.P. Steamship Co. and ticket office, which are very commodious and well laid out and have a strikingly fresh and bright appearance.

The dock is about 870 ft. long from shore line to outer end, and for 350 ft. from the shore is 280 ft. wide. From this part a pier 100 ft. wide extends to the outer harbor line, giving a slip on the west side 515 by 60 ft., and on the east side a slip 550 by 130 ft. With the exception of the shore end, where the dock will be filled in, creosoted bearing piles are used throughout, the specifications for which called for piles to be first growth fir, a minimum of 9 ins. in diameter at the top and 14 ins. at the butts, penetration of oil to be 1 to 1¾ ins. under a 12-lb. treatment. The piles have been spaced at distances varying from 10 ft. centres at inner to 3½ ft. centres at outer end, depending on the penetration and depth of the water, with special provision for piles to carry the spur track. The dock is strongly braced, with brace piles at every bent, driven on a batter, and in addition is braced both laterally and longitudinally with 6 by 12 in. creosoted bracing; also a system of diagonal bracing between the caps is used. On the east side of the dock is a spur track from the C.P.R., depressed so that the car floor will be on a level with the warehouse floor. The dock is equipped with six adjustable slips, three on each side, worked by a worm, four of which are 11 ft. wide and two 8 ft. wide, railway tracks on east side being carried over slips by means of bascule bridges. At each slip is located a power plug for use of electric conveyors. Fender piles of tight bark fir are driven two at every bent, fastened to 12 by 12 in. stringers by means of ¾ in. bolts; they are spaced 5 ft. apart at sea end and clusters of seven were driven at outer corners and lashed with ¾ in. steel cable to act as dolphins.

Space has also been allowed for fuel oil tanks and pump house, which are now in process of erection. These consist of one storage tank, 76 ft. in diameter and 40 ft. high, with a capacity of 32,000 barrels, and one measuring tank 16 ft. in diameter and 24 ft. high of 1,000 barrels capacity, from which a 6-in. pipe line will lead along the base of the dock to the ship's side for the vessels supply of fuel oil, so that in future the regular passenger steamers of the line on which the oil burning system has been installed, and fuel oil tanks built, instead of suffering the delay of three or four hours to call at a coal port en route between here and Prince Rupert as has been the custom since the inauguration of the service, to the discomfort of everybody on board, will be enabled to receive their full supply of fuel for the round trip while lying at the Vancouver dock, and this process will be accomplished simultaneously with the freighting, loading and discharge of passengers and baggage.

On the west side of the approach to the pier, a carpenter and machine shop 34 by 140 ft. is being built, for which the machinery is already on the ground ready to install, which when completed will afford facilities for light repairs and general overhaul of the steamships of the line.

Changes Suggested in Certificates for Masters of Tow Barges.

It has been suggested to the Minister of Marine by the Dominion Marine Association, that a lower grade of certificate should suffice for the master of a barge which is used only as a tow barge. Except in the case of a broken tow line the sole duty of the barge is to follow the towing steamer, and the technical skill required in the case of an ordinary mariner is never exercised. Under the present system only the low class of men holding full certificates engage in services on tow barges, and they are not at all fitted for the service in question. The man who is required is one without a fund of technical knowledge, and yet at the same time skilled in the special business of a tow barge master, which involves, among various other things, skill in the way of managing his lines and his boat with reference to the towing steamer.

The only technical skill required from the master in the way of navigation would be such as emergency might require in the case of a broken tow line. For instance, he might have to know enough to hoist his sail and get the boat to anchorage. This, however, is a very limited matter.

The suggestion made by the Association is that its members would be able to procure splendid men for their services on tow barges, better qualified, in fact, than the material now available if a grade of certificates were permitted which would not require the technical knowledge now required by a master mariner on the great lakes.

Additional Dry Dock at Collingwood.

The specifications for the additional dry dock which the Dominion Government has entered into a contract to subsidize, at Collingwood, Ont., will be built in what was formerly known as the town slip, at the bottom of Hurontario St., and will be of the following dimensions—length over all, 420 ft.; width at coping level, 104 ft.; width at bottom of dock, 100 ft.; depth on the sill at low water, 16 ft. The construction will consist of a substantial earth cofferdam with a toe of concrete bags and stone on the lake side, the removal of the existing walls of the town slip, including masonry, crib work, rock and earth excavations, the excavation to the proper depths of the area occupied by the masonry, the dock proper, the entrance walls, wells, etc., masonry work, the fixing in place of all bottom timber, keel blocks, bilge blocks, entrance works, partly of concrete and partly of crib work with concrete superstructure, a caisson gate with a clear opening of 93 ft., the removal of the cofferdam and of all filling between entrance walls to a depth of at least 18 ft., the erection of a gantry crane with proper steel frame for elevated tramway, equipped with electric hoist and conveyor, electric lighting, excavation and construction for the laying of 46 in. piping to connect the dock with the existing pumping station, enabling the dock to be pumped in less than two hours, the providing of a locomotive crane, air pipe lines, air pneumatic tools, water pipe lines, air compressors, and generally all that may be required for repairing vessels. The whole of the concrete used is to be composed of one part of Portland cement, two parts sand and three to four parts of stone broken to pass through a 2-in. ring. The walls are to be 8 ft. wide at bottom and 3 ft. wide at top. The concrete bottom to be not less than 2 ft. and to conform to the rock foundation. The work will be done by day labor under the supervision of an engineer named by the Public Works Department, and carried out according to plans deposited with the Department, the whole to be in working order by Dec. 15. The subsidy granted is $9,208.96 a year for 20 years, being 3% of the cost of construction.

Stranding of s.s. Celtic.

The following judgment was delivered recently at Vancouver, B.C., by Capt. Jas. Gaudin, agent, Marine Department, concurred in by C. Eddie and J. Stewart, as nautical assessors, re the stranding of the s.s. Celtic on Noble island in the Goletas channel, Oct. 5, 1911, while en route from Vancouver to Prince Rupert and way ports.

The court finds that safe and proper compass courses were not set and steered from Masterman island, and that there was no allowance made for deviation, leeway or tidal stream; that a good and proper lookout was not being kept on board, and that the vessel was not navigated with seamanlike care by the first mate, S. Carlson, who assumed responsibility, notwithstanding his orders to call the master on any change of weather or doubt as to his position. The court also finds that his assertion regarding the inefficiency of the red sector of Scarlet Point light is not substantiated by other evidence, and suspends his certificate as mate of a passenger steamer in the coasting trade for four months from Dec. 13, 1911. It also finds that the master, A. N. Dick, has to some extent lost sight of the responsibilities of a shipmaster in depending too much on what he was told of the mate's abilities, and entrusting him with the navigation

of the vessel in such narrow waters; he is admonished to be more careful in future. The attention of the Marine Department is called to the unsatisfactory custom of vessels being allowed to proceed to sea without a properly situated and adjusted compass, whereby bearings can be taken all round, and disapproval is expressed at the slipshod manner in which the Celtic's log book was kept.

Plans for Welland Canal Enlargement.

An Ottawa press dispatch of Mar. 23 says:—"Engineers who for the past three years have been engaged in surveys of alternative routes for the new Welland Canal have submitted their report to the Minister of Railways and Canals, and J. L. Weller, superintendent of the canal, who had charge of the surveys, has been here in connection with the matter. Several propositions were looked into, careful surveys being made, test pits sunk and calculations figured out in connection with each.

"The plan which has been recommended by the engineers and accepted by the Government provides for the widening and deepening of the present canal from Port Colborne to a short distance north of Thorold, where the new cutting five miles long will start and run west of the present canal, crossing it and the G.T.R. en route and entering Lake Ontario at Ten-Mile Creek, three miles east of Port Dalhousie.

"The present canal will be deepened from 14 to 25 ft. in the stretches and 30 ft. in the locks and will be widened from 150 to 200 ft. The new section will be of similar dimensions. A very important feature of the work is that by reason of the dredging and deepening the number of locks will be reduced from 22 to 7. This, it is calculated, will save eight hours in the time now required for carrying boats through from Port Colborne to Port Dalhousie and is obviously a large consideration in favor of the project. The total estimated cost is $45,000,000. The plans provide for the work being carried ahead in such way that there will be a minimum of interference with navigation. It will be done, one side at a time, allowing the other side for the passage of boats."

Prosecution of a Mate on his Application for Master's Certificate.

The Court of Appeal gave judgment in Toronto, Mar. 19, in the case of the King vs. Gordon S. Wright, which was started by the senior County Court Judge of the County of York. Wright was charged with having on Mar. 12, 1910, at Windsor, Ont., fraudulently made use of a certificate of service to which he was not justly entitled, contrary to the Canada Shipping Act, and that he made a false representation for the purpose of obtaining a certificate of competency contrary to the Act. Wright was a mate on inland waters, and made application before a Government examiner at Windsor for master's papers. The misrepresentation which was charged arose out of the fact that the Government recognizes only one kind of mate. Wright held mate's papers, but served as second mate for a while, and then, for a few months immediately previous to his application to the examiner, served as first mate. In his certificates of service he stated that he had served as mate for over a year.

The County Judge held that there is nothing in the Act to indicate that service as a second mate is not worth as much as service as a first mate for the purpose of acquiring experience in order to become a master, so long as first mate papers are held during all the time. Both kinds of mates exist in reality, although not recognized by the Act. The County Judge found him not guilty, but at the solicitation of the Crown granted a reserved case on the questions (1) Was I right in holding that the use made by defendant of the document was not an offence under the first count; (2) Upon the evidence was I right in law in such a false representation as to constitute an offence under the second count.

The Court of Appeal answered the questions in favor of defendant and sustained his acquittal.

Bird's Eye View of Harbor Works at St. John, N.B., as they will appear when completed. Reproduced from The Sphere, London, Eng.

The Harbor Works at St. John, N.B.

The illustration on this page shows the extensive nature of the harbor works to be constructed at Courtenay Bay, St. John, N.B., by the Dominion Government, with some of the contiguous territory.

The contract provides for a 4,600-ft. breakwater, 9,900 lineal feet of quay walls, a Dreadnought dry dock, 1,000 ft. long, built to the latest British Admiralty specifications, and the reclamation of large tracts of land.

The contractors are Norton Griffiths and Co., Ltd., Montreal and Vancouver, of which W. Burton Stewart is Managing Director and P. R. Warren, Chief Engineer.

The illustration, which is reproduced from The Sphere, London, Eng., doubtless gives a good general idea of the harbor works, but there are some errors in the view of the surrounding country. The city shown as "Salisbury" is Moncton, N.B., the Intercolonial Ry. headquarters, "Port Duchene" should be Point du Chene. "Quaco" should be shown as St. Martins, the terminus of the St. Martins Ry. The starting point of the line to Montreal is incorrectly shown.

The Dominion Public Works Department will receive tenders to Apr. 9 for the machinery of a 3½ yd. dipper dredge.

G. W. Stephens, Chairman, Montreal Harbor Commission, has been appointed to represent the Dominion Government at the International Association of Navigation Congresses at Philadelphia, Pa., May 23-28.

Coast, Lake and River Officers for 1912.

The following appointments made by the principal navigation companies engaged in Canadian navigation, for their various steam vessels and tugs for the current year, have been officially reported to The Railway and Marine World by the managements. In the first column is given the name of the vessel, in the second, that of the captain, and in the third, that of the chief engineer.

ALGOMA CENTRAL STEAMSHIP LINE, SAULT STE. MARIE, ONT.

Agawa	W. C. Jordan	J. L. Smith
Leafield	A. McIntyre	L. B. Cronk
Paliki	J. A. Brown	W. T. Rennie
Thos. J. Drummond	R. H. Boyle	G. Sylvester

BAY OF FUNDY AND MINAS BASIN STEAMSHIP CO., MARGARETVILLE, N.S.

Brunswick	H. W. Moore	H. L. Rile.
Margaretville	S. Baker	A. Harris
Ruby L.	C. D. Baker	F. McGray

BOUCHARD BROS., QUEBEC, QUE.

Lady of Gaspe	E. Bouchard	R. Casey

BRAS D'OR STEAMBOAT CO., LTD., NORTH SYDNEY, N.S.

Marion	L. A. Moore	W. R. Coleman

BURNHAM, MORRILL AND CO., HALIFAX, N.S.

Mary Jane	B. McMillian	W. Barss
Robie M.	R. A. Hines	J. McArvil

BUTLER FREIGHTING AND TOWING CO., LTD., VICTORIA, B.C.

Grainer	M. Pike	A. Pike

CALVIN CO., LTD., GARDEN ISLAND, ONT.

Cornwall	W. Phelix	T. Gray
Frontenac	J. Harris	T. Compeau
India	C. Beaupre	T. Smith
Parthia	D. Lefavre	G. Sauve
Prince Rupert	P. Sullivan	R. Veech
Simla	C. Coons	D. Simons
W. Johnston	.....	C. Lalonde

CANADA ATLANTIC TRANSIT CO., LTD., MONTREAL.

Arthur Orr	J. Simons	D. E. Mance
George N. Orr	H. Jaenke	J. B. Wellman
Kearsarge	W. Baxter	A. P. Williams
Newona	W. J. Moles	.....

CANADIAN FISHING CO., LTD., VANCOUVER, B.C.

Celestial Empire	D. Barry	P. Vint
Flamingo	A. Freeman	W. Britton

CANADIAN LAKE TRANSPORTATION CO., LTD., TORONTO.

Arabian	J. Denton	J. Morris
Corunna	T. H. Johnston	W. A. McLaren
Kenora	W. Brian	W. Byers
Nevada	J. E. Mann	W. Linton
Regina	P. McKay	C. J. McSorley
Tagona	J. S. Moore	W. H. Taylor

CANADIAN NORTHWEST STEAMSHIP CO., LTD., PORT ARTHUR, ONT.

Neebing	J. Ewart	R. R. Foote

CANADIAN PACIFIC CAR AND PASSENGER TRANSFER CO., LTD., PRESCOTT, ONT.

Charles Lyon	G. M. Hazlett	W. Henry

C.P.R. BRITISH COLUMBIA COAST SERVICE, VICTORIA, B.C.

Beaver	C. E. Seymour	J. Carmichael
Charmer	J. Ritchie	J. M. Greenshields
Czar	F. R. Springall	S. R. Roberts
Joan	W. L. Gilchrist	C. H. Waller
Nanoose	T. S. Guns	A. Alexander
Otter	J. Shaw	W. Harris
Princess Adelaide	C. Campbell	T. Moffatt
Princess Alice	R. A. Hunter	J. Petticrew
Princess Beatrice	L. P. Locke	J. E. Hill
Princess Charlotte	T. O. Griffin	J. A. Heritage
Princess Ena	G. D. Robertson	G. Kearsley
Princess May	John McLeod	W. Oliver
Princess Mary	.....	R. Moffatt
Princess Royal	D. Brown	J. Thaw
Princess Victoria	P. J. Hickey	Jas. Wallace
Qualicum	J. Manson	J. H. Purdy
Queen City	G. J. Hawes	S. Stewart
Tees	E. Gillam	B. Osborn

C.P.R. BRITISH COLUMBIA LAKE AND RIVER SERVICE, NELSON, B.C.

Aberdeen	J. B. Weeks	J. W. Anderson
Castlegar	M. P. Reid	T. W. Bracewell
Columbia	W. H. Wright	N. Hawthorn
Hosmer	F. L. Orr	W. Jacobs
Kokanee	L. McKinnon	D. H. Biggam
Kootenay	G. Robertson	T. F. McKechnie
Kuskanook	W. Seaman	J. G. Cameron
Minto	A. Forslund	J. Fyfe
Moyie	O. J. Alfsmo	D. McLeod
Okanagan	G. L. Estabrooks	J. Grey
Proctor	J. Fitzsimmons	P. H. Pearse
Sandon	G. Graham	R. H. Hale
Slocan	W. Kirby	H. Colbeck
Valhalla	J. Ferguson	W. J. Liver
Whatshan	J. Dougal	J. Russell

C.P.R. DETROIT RIVER CAR FERRIES, WINDSOR, ONT.

Michigan	R. Brown	F. Merril
Ontario	J. Carney	A. McDonald

C.P.R. UPPER LAKE SERVICE, PORT MCNICOLL, ONT.

Alberta	F. J. Davis	C. Butterworth
Assiniboia	L. Pyette	A. Cameron
Athabasca	J. McCarmel	W. Lockerbie
Keewatin	M. McPhee	W. Lewis
Manitoba	J. McIntyre	J. Aston

HUGH CANN AND SONS, MULGRAVE, N.S.

John L. Cann	J. B. Scott	W. McKay
Malcolm Cann	J. R. Durkee	D. E. Read
Robert G. Cann	W. M. Morris	J. Cummin

CAPE BRETON ELECTRIC CO., SYDNEY, N.S.

Hygeia	A. McLeod	W. J. Scott
Pawnee	J. Brown	A. Campbell
Peerless	I. H. Lewis	C. Campbell

CENTRAL CANADA COAL CO., LTD., BROCKVILLE, ONT.

Samuel Marshall	W. A. Tulloch	F. A. Pringle

CHARLOTTETOWN STEAM NAVIGATION CO., LTD., CHARLOTTETOWN, P.E.I.

Empress	A. Cameron	J. A. Rowe
Northumberland	A. MacLeod	C. Cuming

COAST STEAMSHIP CO., LTD., VANCOUVER, B.C.

British Columbia	G. Foellmer	J. Ellison
Celtic	H. S. Nelson	J. Middlemas
Clansman	M. F. McDonald	A. Anderson
Fingal	J. Finlay	M. Learreta

CRYSTAL STREAM STEAMSHIP CO., LTD., ST. JOHN, N.B.

Sincennes	F. Mabee	J. Williams
Majestic	F. Day	G. Blewett

DOMINION ATLANTIC RY., YARMOUTH, N.S.

Boston	A. Simms	W. E. Sutherland
Prince Albert	D. W. Holmes	A. McInnes
Prince Arthur	E. J. Kinney	J. Ross
Prince George	A. W. McKinnon	L. C. Newell
Prince Rupert	A. G. Potter	J. Pendrigh
Yarmouth	A. W. MacDonald	D. Kingston

EASTERN MANITOULIN ROYAL MAIL STEAMSHIP LINE, LITTLE CURRENT, ONT.

Bon Ami	E. Mackie	R. A. Johnston
John Haggart	W. G. Smith	S. Clark

FARRAR TRANSPORTATION CO., LTD., COLLINGWOOD, ONT.

Collingwood	F. Scott	D. McLeod
Meaford	J. N. Sbeats	John Smith

FOLEY, WELCH AND STEWART, VANCOUVER, B.C.

Conveyor	J. Shannon	N. A. Chalmers
Distributor	J. P. Douglas	J. Physick
Omineca	T. J. Jackman	A. Forbes
Operator	C. Myers	D. Martin

GASPE AND BAY CHALEUR STEAMSHIP LINE, QUEBEC, QUE.

Gaspesian	P. Blouin	N. Protomastro

GRAND MANAN STEAMSHIP CO., LTD., GRAND MANAN, N.B.

Grand Manan	J. A. Ingersoll	W. Gray

GRAND TRUNK PACIFIC COAST STEAMSHIP CO., LTD., VANCOUVER, B.C.

Escort No. 2	.....	J. C. Scott
Henriette	D. Donald	R. A. Gray
Prince Albert	D. MacKenzie	E. C. Brand
Prince George	F. T. Saunders	I. O. Handy
Prince John	C. W. Wearmouth	E. N. Valentine
Prince Rupert	B. L. Johnson	D. H. Ferrier

F. E. HALL AND CO., MONTREAL.

Carleton	E. Groulx	E. Scott
Iona	P. Emond	F. Patterson
Sindbad	J. O. Grey	W. H. Jennison

HALL AND ELIGH, LTD., OTTAWA, ONT.

Roberval	P. Eligh	N. Contois

W. HANNA AND CO., PORT CARLING, ONT.

Mink	J. J. McCulley	.....
Numinko	W. Board	S. W. Lambert

INLAND LINES, LTD., HAMILTON, ONT.

Donnacona	R. Alexander	F. Wilson
Dunelm	C. R. Albinson	G. E. Wilson
Dundee	J. Woolner	E. Shaw
Dundurn	R. Cooney	A. L. Black
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Empress of Fort William	J. Wilson	J. A. Murphy
Empress of Midland	J. L. Baxter	J. Dee
Glenellah	G. Mackey	W. A. McWilliams
Midland King	W. Cunningham	J. McGregor
Midland Prince	J. Tindall	J. Pickard
Midland Queen	W. Lavigne	J. Thorburn
Neepawah	W. W. Allan	J. C. Carr
Rosedale	G. Motley	F. Goodwin
Stadacona	J. Cannally	C. H. Menmuir
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Ionic	J. D. Montgomery	J. H. Louden
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Quebec	L. A. Demers	J. Hamelin
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Rapids Prince	P. Putnam	W. Chipman
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Scotia	J. McDonald	D. Suillvan
Selkirk	—. McMasters	W. C. Vey
White Horse	W. Turnbull	P. Larssen

Canadian Notes to Mariners.

The Department of Marine has issued the following:—

10. Feb. 15. 22. Nova Scotia, Cape Breton island, east coast, Great Bras d'Or, off McNeill beach, Seal reefs, red conical buoy to be replaced by gas buoy. 23. Nova Scotia, Cape Breton island, east coast, Great Bras d'Or, Man of War point, lighthouse established.

11. Feb. 20. 24. British Columbia, Vancouver island, west coast, Quatsino sound, Entrance island, hand fog horn at light station. 25. British Columbia, Strait of Georgia, sandheads of Fraser river, change in position of gas and whistling buoy, change in position of lightship.

12. Feb. 23. 26. Quebec, Chaleurs bay, Bonaventure river, wharf increased in length, light moved to end of wharf. 27. Quebec, Saguenay River, Riviere du Moulin, front range light, correction. 28. Quebec, River St. Lawrence, channel between Hare island and Hare Island south reef, change in position and color of buoy.

13. Mar. 4. 29. Ontario, River St. Lawrence, Wolfe island, Quebec point, lighthouse rebuilt. 30. Ontario, Lake Ontario, Welland canal entrance, Port Dalhousie, change in characteristic of back range light. 31. Ontario, Lake St. Clair, Mitchell bay, range lights established.

14. Mar. 6. 32. Ontario, Georgian bay, Nottawasaga island, period of flashes of light. 33. Ontario, Lake Huron, north channel, Badgeley island, range lights established.

15. Mar. 7. 34. New Brunswick, Bay of Fundy, Chignecto channel, Fort Folly point, change in color of lighthouse. 35. Nova Scotia, south coast, entrance to Halifax harbor, Sambro outer bank, change in position of light ship. 36. England, west coast, Bristol channel, King road, new range lights established. 37. England, south coast, Spithead approach, St. Helens fort, intended alteration in character of light.

16. Mar. 18. — 38. New Brunswick, River St. John, Hampstead, light pole replaced by tower. 49. Nova Scotia, Cape Breton Island, east coast, Sydney harbor, southeast bar, change in position of lighthouse. 40. Canada, Hudson Bay, Port Nelson, March point, description of beacon.

17. Mar. 20.—41. Nova Scotia, Bay of Fundy, Minas basin, Cobequid bay, Spencer point lighthouse, correction. 42. Nova Scotia, southwest coast, intended change in position of Blonde rock gas and whistling buoy. 43. Nova Scotia, George bay, off northern entrance to Gut of Canso, whistling buoy established. 44. Quebec, Restigouche river, Oak point gas buoy, change in color of buoy, change in characteristic of light. 45. Quebec, Gulf of St. Lawrence, Anticosti lightship, characteristic of fog alarm.

The Loss of the s.s. Renwick.

Following is a summary of the judgment in the matter of the total loss of the Renwick Co.'s s.s. Renwick, operated by the Port Hood Richmond Ry. Coal Co., occasioned by a collision with the s.s. St. Pierre Miquelon, off Country Harbor, N.S., Dec. 27, 1911, delivered by L. A. Demers, Dominion Wreck Commissioner, and concurred in by Capt. N. Hall, Halifax Port Warden, and Capt. J. W. Harrison, Superintendent, Furness, Withy and Co.

The court having carefully weighed the evidence, which is exceptionally contradictory, finds that the s.s. Pierre Miquelon is alone responsible for the collision resulting in the total loss of the s.s. Renwick and three of her crew. Capt. Lacerdair, of the St. Pierre Miquelon, was bound, according to the elementary laws of humanity, to lower a boat and proceed to the rescue as well as make thorough searches in the vicinity of the wreck, and his unpardonable neglect in this respect will be brought to the attention of the French consul in order that he may advise his Government. The captain and second officer of the s.s. Renwick are exonerated from all blame in so far as the collision itself is concerned, but the court cannot overlook the fact that very little effort was made to ascertain if all hands had mustered before leaving the wrecked ship, and in view of this neglect and his subsequent action in not even attempting to search for bodies, Capt. Chapman stands censured, and Chief Engineer E. Meehan, for similar neglect in regard to his staff, is warned that in a like instance he should assure himself that the men under his charge are out of danger.

The Necessary Carrying of Men on Tugs and Wrecking Steamboats.

The present law re carrying men on tugs and wrecking steamboats without passenger licenses is continually being broken, and necessarily so in a great many cases where boats without passenger license require to carry men other than the master and crew. An instance may be given of a tug boat which has disposed of its raft of logs and requires to take back to the starting point the men who worked the raft during its progress. If these men are not carried back by the tug it would sometimes be necessary to pay railway fares, etc., for them. Another case is that of the ordinary wrecking vessel which takes extra men to the scene of disaster to engage in the work of rescue, lightering or other operations, and has no license to carry men other than its actual crew.

It has been suggested to the Minister of Marine by the Dominion Marine Association that the definitions of "passengers" and "passenger steamboats" in the Canada Shipping Act should be limited by the re-insertion of the words "carried for hire." so that if a party has not paid for his passage he will be on the same footing as a member of the crew, and in this way, if no passage money of any kind is paid, the vessel will be exempt from the ordinary requirements applicable in the case of a passenger steamboat. This would be perfectly fair to all parties.

If, on the other hand, the Minister feels that protection must be afforded to the men other than the crew who permit themselves to be carried, the members of the association would not consider it unreasonable to have provision required for lifeboat accommodation, and would also be content with certain limited requirements in other respects such as might be considered absolutely necessary. Provision should, however, be made for cases of emergency in order that men might be carried irrespective of the requirements of the law where the safety or protection of life or property required such carriage to take place.

Atlantic and Pacific Ocean Marine.

The Russian East Asiatic Steamship Co.'s s.s. Lituania arrived at Halifax, N.S., Mar. 3, from Libau. This is the first steamship sent to Canada by this company, which proposes to operate a fortnightly service all the year round.

It is reported from Kingston, Jamaica, that the C.P.R. is negotiating for the establishment of a fast steamship service between Canada and Jamaica, and asking for a subsidy of $300,000 a year, half from Canada and half from Jamaica.

With reference to the appointment of F. S. MacGregor as Assistant General Passenger Agent, Allan Line, Toronto, as mentioned in our last issue, we are officially advised that Mr. MacGregor continues also to act as Travelling Agent for Ontario.

The Dominion Government recently presented R. G. Richards, master of the British s.s. Glenmay, with a silver cup, in recognition of his services in rescuing the crew of the Lunenburg, N.S., schooner Renown, which was abandoned at sea Oct. 5, 1911.

The Dominion Government has continued the arrangement with the Allan Line for the service between Montreal and Havre, France, for the forthcoming season. It is reported that the company will this year operate the steamships Ionian, Sicilian, Corinthian and Lake Erie in this service.

Furness, Withy and Co.'s s.s. Hochelaga, recently launched at Middlesbrough, Eng., of which mention was made in our last issue, will, on completion, together with her sister vessel Lingan, also under construction at Middlesbrough, be chartered to the Dominion Coal Co. Both vessels are being built specially for the coal trade.

The Canadian Northern Steamships, Ltd., s.s. Royal Edward was delayed a week at Bristol, Eng., recently owing to the coal strike throughout Great Britain. The s.s. Royal George, which has been laid up for the greater part of the winter, has been thoroughly overhauled, and it is anticipated that her speed will be materially increased this season.

An official of the Japanese Government railway bureau, who arrived at Victoria recently, is reported to have stated that unless a sum, practically

equal to the value of the hull, be spent on the C.P.R. s.s. Empress of China, which was wrecked off the Japan coast some time ago, and which is now docked at Uraga, it will be impossible to make her seaworthy. In his opinion, after an examination of the hull, the only course is to scrap her, as the engines appear to be the only parts which are not damaged to any extent.

In connection with the proposed fast service between Canada and Great Britain, which it was recently stated in England would be a joint scheme in which the principal steamship companies in Canada and British capital would be concerned, Sir Thos. G. Shaughnessy, on his return from the southern States, Mar. 10, is reported to have stated in Montreal that the C.P.R. would be connected with the scheme in its entirety, or not at all, and that although favoring Halifax as a winter port, he considered that the St. Lawrence route should be used in the summer.

The Donaldson Line s.s. Letitia, recently launched at Greenock, Scotland, is of the following dimensions—length between perpendiculars, 470 ft.; breadth, 56 ft. 8 ins.; depth, moulded, 39½ ft. to shelter deck. She has been designed chiefly for the immigrant service, and is of the highest class at Lloyds. The accommodation for second class passengers is arranged on the bridge, shelter and upper decks, for about 300. The third class passenger accommodation, for about 600, is arranged on the shelter, upper and main decks. The machinery consists of two sets of triple expansion engines, driving two screws.

At the recent annual meeting of the Union Steamship Co. of New Zealand, at Dunedin, the chairman, in referring to the Canadian service, said that it may be looked upon as an established route, and having regard to the enormous growth of the population in Canada, it was necessary to look to the future, and it had been decided to build a large passenger vessel of the highest class for the mail service. The company had placed a contract for the construction of a vessel at Clydebank, Scotland, the dimensions of which would be—length, 522½; ft. beam, 66 ft.; depth, 37½ ft.; gross tonnage, about 13,500 tons. She will have accommodation for 278 first class, 224 second class, and 202 third class passengers, and will be equipped with combined reciprocating and turbine engines for a speed of 17 knots an hour. Four of the boilers will be fitted for oil burning and six for coal burning, and the bunkers and ballast tanks will be built with a view to using oil entirely if the experiment with the four boilers proves satisfactory and oil is obtained at a reasonable cost in Australia or en route. She is expected to be ready for delivery in December, and should be placed in service early in 1913.

Maritime Provinces and Newfoundland.

The assets of the Miramichi Pulp and Paper Co., Chatham, N.B., which are to be offered for sale by public auction, Apr. 23, under an order of the Chancery Court, included the steam tug Edith and other vessels.

The Reid Newfoundland Co. is reported to have placed orders for two new vessels, to be built at Newcastle, Eng., for its Port aux Basques to Sydney route, with a view to operating a daily service between these ports.

The French Government has entered into a contract with the Newfoundland Produce Co., St. John's, Nfld., by which the latter will run its s.s. Sagona between Halifax, N.S., and St. Pierre, Miquelon, for a subsidy of 90,000 francs a year.

The Beaver Dredging Co., Ltd., has been incorporated under the Dominion Companies Act, with $300,000 capital and office at Lancaster, N.B., to carry on a general dredging business. The incorporators are G.S., L. La T., and H. Mayes; C.B., and T. A. Lockhart, St. John, N.B.

The Atlantic Dredging and Construction Co. is applying for incorporation under the New Brunswick Companies Act, with $250,000 capital and office at Loggieville, N.B., to carry on a general dredging and construction business; the incorporators being R. O'Leary, Richibucto; F. W. Sumner, Moncton; T. Nagle, St. John, and F. Ryan, Sackville.

The British s.s. Isleworth, from Boston, Mass., to Louisburg, N.S., in ballast, ran on the rocks off Chebucto Head, near the entrance to Halifax harbor, Mar. 13, and became a total loss. She had previously lost three of her four propeller blades in the ice, and in the high sea and fog was unmanageable. She was a new vessel, on her way from Great Britain to take up a charter for the Dominion Coal Co.

The Dominion Coal Co.'s s.s. Bonavista, which ran ashore at Blacks Cove, on the Bay of Fundy, off Long Island, just west of the Digby Boar's Head light, Mar. 16, is reported to be a total wreck, and, it is stated, was not insured. She was built at Newcastle, Eng., in 1884, and was equipped with engine of 160 n.h.p., driving a screw. Her dimensions were—length, 240.4 ft.; breadth, 33.5 ft.; depth, 18.3 ft.; tonnage, 1,306 gross, 837 register.

The litigation between the St. John River Steamship Co. and the Crystal Stream Steamship Co., in connection with the use of what is known as the Star Line wharf, at Indiantown, St. John, N.B., was closed, Mar. 8, when $1,000 damages were awarded to the Crystal Stream Steamship Co. for dispossession and use up to the present time, and $11.50 for 23 days' use, to the St. John River Steamship Co., which is to pay all costs. It is stated that an appeal may be entered.

The Consolidated Pulp and Timber Co., Ltd., has been incorporated under the New Brunswick Companies Act, with $5,000,000 capital and office at St. John, to carry on a general pulp and paper manufacturing business, to operate tramways, steam and other vessels, etc. Among the properties taken over is the St. John Forwarding Co. The incorporators are—N. M. Jones, Bangor, Me.; D. Morrice, Hon. R. Mackay, Montreal; T. McAvity, A. H. Hannington, H. W. Schofield and C. S. Hannington, St. John, N.B.

The decision of the Dominion Wreck Commissioner in the enquiry into the loss of the Renwick Co.'s s.s. Renwick, operated by the Inverness Ry. and Coal Co., and the s.s. St. Pierre Miquelon, which occurred in Dec., 1911, exonerates the master of the s.s. Renwick from blame in connection with the collision, but censures him for not standing by to save, if it were possible, all the members of the crew, three of whom were drowned. The officers of the s.s. St. Pierre Miquelon were made responsible for the collision, and the Renwick Co. has entered action for $48,000 damages for the loss of the vessel.

The improvement works at Courtenay Bay, St. John, N.B., the contract for which was recently awarded to Norton Griffiths and Co., cover an area of about 400 acres, which will be enclosed by a breakwater 4,570 ft. long, averaging 20 ft. wide at the top and 150 ft. at the bottom. The area so enclosed will be dredged to 32 ft. below low water, and on the city side of the bay a large tract will be reclaimed for railway terminals. Berthing accommodation will be provided for 22 vessels, up to 800 ft. long, and about 4,734 ft. of wharves will be built. A dry dock 900 ft. long, which is also included in the contract, will be built on the eastern side of the bay. P. R. Warren, engineer in charge for the contractors, is reported to have said recently that construction of the breakwater would be proceeded with first so that dredging might be commenced at the earliest moment.

Province of Quebec Marine.

J. A. Masse has been appointed Superintendent of the Montreal harbor yard.

The Department of Railways and Canals will receive tenders to Apr. 1 for the leasing of the Tate dry dock on the Lachine canal for five or ten years.

The St. Lawrence Navigation Co.'s s.s. Mahone sailed from Riviere du Loup, Mar. 3, for Seven Islands, and returned, calling at Trinity Bay, Bersimis and Escoumains, Mar. 8.

Capt. L. O. Belanger, who was for 35 years in the Richelieu and Ontario Navigation Co.'s service, and for 15 years as master of the s.s. Quebec, died at Montreal, Mar. 10, aged 73.

Two tugs are under construction at the Tate dry dock, on the Lachine canal, one being for the superintendent's service and the other for dredging on the canal. The first one is 93 ft. long, and the other, 60 ft. long.

The Ungava Exploration Co., Ltd., has been incorporated under the Dominion Companies Act, with $1,000,000 capital and office at Toronto, to carry on a general exploration and development business and to own and operate vessels, wharves, docks, etc.

The Marine Department is making surveys for the placing of five new range lights in the St. Sulpice channel, St. Lawrence River, thus making it possible for tows and light draught vessels to use the north channel, instead of obstructing to some extent the main ship channel.

A number of shipping companies have forwarded a memorial to the Dominion Premier, protesting against the proposal to build the projected Quebec dry dock on the Beaupre Flats at the mouth of the St. Charles River, instead of at St. Joseph de Levis, as at first decided. They also suggest that the dock be not less than 110 ft. wide and 40 ft. deep at high water.

The Quebec Transportation and Forwarding Co. is having a steam tug built at Quebec. Following are the chief dimensions—length, 110 ft.; breadth, 23 ft.; depth, 10½ ft. She will be equipped with fore and aft compound surface condensing engines with cylinders 20 and 40 ins. diar., by 30 ins. stroke. A new boiler has been installed in the company's tug Florence.

Work on the construction of the floating dry dock for the Montreal harbor is reported to be progressing at Barrow-in-Furness, Eng., where it is being built by Vickers, Ltd. It is anticipated that it will be completed early in the summer, when it will be towed across the Atlantic, and placed in position in the basin, which is being prepared at Maisonneuve. The trip across is expected to be accomplished in a month.

A deputation representing the Shipping Federation of Canada waited on the Dominion Government recently to urge the building of a dry dock at Levis. A. A. Allan, President, stated that more than a dozen vessels now plying on the St. Lawrence route were too large for any dry docks at present existing in the vicinity, and pointed out the necessity of adequate dock accommodation in order to keep down insurance rates.

Ontario and the Great Lakes.

Capt. B. Todd, of St. Catharines, a well known navigator on the Great Lakes, died at Buffalo, N.Y., Mar. 15, aged 58.

The Niagara, St. Catharines and Toronto Navigation Co.'s steamboat Garden City has had new boilers installed.

The Brockville Transportation Co.'s steamboat Senator Derbyshire is having her hull and machinery generally overhauled.

G. M. Arnold, heretofore Chief Engineer, Niagara Navigation Co., has been appointed Dominion steamboat boiler inspector at Toronto.

The Northern Navigation Co. will, it is stated, not make calls at Sault Ste. Marie, Mich., this season, as heretofore, on account of the raising of the wharfage rates for the season.

E. L. Cousins, Engineer, Toronto Harbor Commission, is on a tour of the harbors along the U.S. Atlantic coast, being accompanied over a portion of the route by J. G. Sing, Consulting Engineer for the commission.

The Canadian Lake and Ocean Navigation Co. has entered four actions against insurance companies for $37,995 for the loss of the s.s. Turret Cape, which was wrecked on Cove island, Lake Huron, Nov. 17, 1911.

Capt. D. A. Kiah, who died at Detroit, Mich., Mar. 2, was for some time a resident of Collingwood, Ont., and was master of the Chicago, Ogdensburg and Lake Champlain Line's steamboat Canada, then operating between Collingwood and Chicago.

The headquarters of the C.P.R. Upper Lake Service will, we are officially advised, be changed from Owen Sound to Port McNicoll as soon as navigation opens. All the vessels of the Upper Lake Service will sail from Port McNicoll, and one of them will call at Owen Sound on its way up.

The Minister of Railways and Canals, in response to questions in the House of Commons recently, stated that 375,239 tons of coal and 488,366 bush. of wheat passed through the St. Lawrence canals during 1911, in Canadian or British bottoms, and 381,235 tons of coal and 1,235,434 bush. of wheat in U.S. bottoms.

Owen Sound taxpayers, by 1,794 to 85, have passed a bylaw ratifying the agreement granting a bonus of $10,000 a year for 20 years, the taking of $50,000 common stock and granting exemption of taxation for 10 years, to a company for the construction of a dry dock and shipbuilding plant at an approximate cost of $1,500,000.

The Montreal and Cornwall Navigation Co.'s s.s. Brittanic has been overhauled and repairs made, including the installation of a new combustion chamber in the boiler, and new bulwarks. The steamboat Filgate, which was considerably damaged by fire last year, is also being repaired and will be operated during the coming season.

The St. Clair and Erie Ship Canal Co.'s bill, extending for two years the time within which it may commence the construction of its undertaking and expend 10% of its capital stock thereon, and for five years the time for the completion and putting in operation of same, was read a second time in the Senate, Mar. 13.

The Inter-American Steamship Co., Ltd., has been incorporated under the Dominion Companies Act, with $50,000 capital, and office at Toronto, to carry on a general shipowning, shipping and navigation business. The incorporators are—G. M. Clark, R. W. Hart, M. Gordon, G. M. Miller and C. H. C. Leggott, Toronto.

Press reports from Sault Ste. Marie state that the Sault Dry Dock and Shipbuilding Co.'s charter has been acquired by F. H. Clergue and associates, who were formerly connected with the Lake Superior Corporation. It is stated that work on the construction of the dry dock and shipbuilding plant will be commenced as soon as the weather permits.

The Merchants Mutual Line, Ltd., Toronto, has recently placed orders for the construction of two steamboats for general lake traffic. One of these vessels is being built at Port Arthur and the other was ordered at Glasgow, Scotland, on the recent visit of J. W. Norcross, General Manager, to Great Britain.

It is reported that the underwriters have given the contract for the raising of the s.s. Turret Cape, which went ashore on Cove island, Lake Huron, towards the close of navigation last year, to the Reid Wrecking Co., Sarnia, Ont., who have taken the work on the "no cure, no pay" basis, with the intention of taking the vessel to Collingwood for overhauling.

The city of Toronto's tug, G. R. Geary, was launched, Mar. 7, being named after the mayor and christened by his mother. The tug was built by Polson Iron Works, the dimensions being—length 70 ft., beam 15 ft., draft 7 ft. She is equipped with high pressure single cylinder engine, with cylinder 18 ins. diar., by 20 ins. stroke, and with Scotch marine boiler.

The Algoma Central Steamship Line's steamboat Paliki is being overhauled at Collingwood. Her two Scotch boilers are being replaced by one boiler of similar type, 15½ by 10½ ft., with three furnaces, each 47 ins. diar., and the bushing of the high pressure cylinder of the engine is being changed. The new boiler will carry 180 lbs. of steam, instead of 160 lbs., as in the old boiler.

Capt. W. Tate Robertson, one of the pioneer captains of the upper lakes, died at Owen Sound, Mar. 17. He was born at Chatham, Ont., in 1863, and was for some time purser on the old steamboat Francis Smith, and subsequently captain. He retired from navigation service in 1902, since when he was for a period deputy consul for the U.S., and for the past three years harbor master at Owen Sound.

Press reports state that an additional steamboat service will be operated between Toronto and Lewiston, N.Y., on the Niagara route this summer, to be known as the People's Line, and that wharfage accommodation is being arranged for at Niagara-on-the-Lake, Lewiston and Queenston. H. W. Crawford, who last year ran a steamboat between Toronto and Olcott, N.Y., is said to be the promoter.

The Inland Lines has been having a number of its vessels overhauled. The Midland King is having her between deck beams moved for convenience of unloading. The Dundurn is being fitted with new steam steering gear, and the hull of the Rosedale is being repaired, a number of plates being taken off and re-rolled, and about 20 plates being replaced, consequent on damages received in the St. Lawrence canals last season.

The Northern Navigation Co.'s vessels will this season be improved by the addition of several conveniences for the comfort of passengers. The steamboats Majestic, Germanic and City of Midland are having electric push buttons fitted in all the staterooms and other parts of the vessels, and annunciators and bell boys will be provided. Running water is also being put in on the steamboats Germanic and City of Midland, and a new pantry and new lavatories on the latter vessel. The Huronic's hull and machinery are also being repaired.

The Montreal Harbor Commissioners, Mar. 12, considered the case to be presented by Canadian navigation interests before the U.S. Secretary of War, at Washington, Mar. 27, against the request of the Chicago sanitary district for permission to divert from 4,000 to 10,000 ft. of water per second of the water flow of Lake Michigan, for a drainage canal. The proposed canal will be 28 miles long, 200 ft. wide and 28 ft. deep, and it is estimated that one-sixteenth of the total low water flow of the lake would be taken, which would lower the level of the lake by from 4½ to 6 ins., thus materially reducing the carrying capacity of vessels operating on the Great Lakes, and thereby enhancing the cost of carrying cargoes. The Minister of Marine appointed John Kennedy, Consulting Engineer of the Montreal Harbor Commission; J. Stewart, of the Hydrographic Department, and V. W. Forneret, St. Lawrence Ship Channel Engineer, to examine the whole situation and report in time to permit of the presentation of Canada's case.

The Port Colborne and St. Lawrence Navigation Co., the incorporation of which we announced in our last issue, has purchased the St. Lawrence and Chicago Steam Navigation Co.'s steamboat Algonquin, which it will operate between Montreal and Port Colborne, and it has also purchased the steamboat Cataract, which it proposes to remodel as a lighter to take care of the freight at Montreal. The Algonquin was built at Glasgow, Scotland, in 1888, and is screw driven with engine of 150 n.h.p. Her dimensions are—length, 245 ft.; breadth, 40.1 ft.; depth, 20.6 ft.; tonnage, 1,806 gross, 1,172 register. The company is closely allied to the Maple Leaf Milling Co., and has the following officers and directors:—President, H. Shaw; Vice President, Cawthra Mulock; other directors, C. W. Band, J. S. Barker and W. D. Robertson.

Manitoba, Saskatchewan and Alberta.

The Standard Shipping Co., Ltd., Winnipeg, is applying to the Manitoba Legislature to confirm the increase of its capital stock from $5,000 to $50,000.

The Lake Winnipeg Shipping Co. has applied to the Winnipeg city council for a lease of the ends of Broadway and Water St., on the Red River, for the construction of a dock.

The South Harbor Sand Co., Ltd., has been incorporated under the Manitoba Companies Act, with $50,000 capital and office at Winnipeg, to carry on a stone quarrying and sand business, to operate vessels, and carry on a general transportation business in freight and passengers. A. J. Andrews, C. A. Millican, R. Hall, W. H. Hall and M. W. Julien, Winnipeg, are the incorporators.

With reference to the report mentioned in our last issue, that the Hudson's Bay Co. had made arrangements for the construction of two boats at Athabasca Landing, Alta., during the coming summer, we are officially advised that one of them will be 120 ft. long and the other about 160 ft. One will be operated on the Slave River and the Lesser Slave Lake, and the other on the Athabasca River.

The Hudson Bay Navigation Association has been formed at Grand Forks, N.D., by a number of the mayors of towns and cities in the Red River valley to secure recognition of the importance of the Red River as a possible waterway to the sea, by way of the Hudson Bay. It is stated that the question of improving the Red River between Winnipeg and Grand Forks will be taken up at a meeting of navigation men, to be held in Winnipeg in the summer.

A report which has been submitted to the U.S. Congress with reference to the proposals to improve the navigation of the Red River, so as to make a

through waterway to Hudson Bay, states that the construction of large storage reservoirs in the vicinity of the Red River is not necessary nor desirable in the interests of navigation. It is pointed out that the district drained by the river is covered with a network of railways, which in some cases offer better shipping facilities to elevator centres than the water routes, and that no increase in expenditure is warranted by present or prospective commerce on the Red River to the north.

The bill to incorporate the Winnipeg and St. Boniface Harbor Commissioners, introduced by the Minister of Marine, and read a first time in the House of Commons, Mar. 13, provides that the limits of the harbor shall include all the waters within the cities of Winnipeg and St. Boniface at the time of the passing of the act, and that the board shall consist of five members, three being appointed by Winnipeg and two by St. Boniface, each holding office for three years, and being eligible for re-appointment. The Manitoba Legislature has amended the Winnipeg city charter, permitting it to guarantee the commission's first mortgage bonds to the extent of the value of the works and improvements carried out, on the authority of a bylaw passed by the ratepayers.

British Columbia and Pacific Coast Marine.

The California Steamship Co., Ltd., has changed its registered office from Vancouver to Victoria.

The Union Steamship Co.'s s.s. Chelohsin, which was recently built in Ireland, made her first trip from Burrard Inlet, at the end of February, attaining a speed of 12 knots an hour.

The G.T.P. Coast Steamship Co.'s s.s. Prince George, which has been equipped with oil burning apparatus, was returned to service early in March, and made her first trip from Victoria to the north, Mar. 3.

The Merchant Service Guild of British Columbia has been formed, with headquarters at Victoria, consisting of officers in the merchant service on the coast, for the protection and guidance of masters and mates.

The Minister of Marine has decided that sick mariners' dues shall be collected once only in each voyage, in the case of vessels arriving from overseas, the term voyage being deemed to include outward and homeward passages.

The Dominion Government has awarded the mail contract for the Gulf Islands to the C.P.R. This service was formerly carried out by the s.s. Iroquois, which was wrecked last year, since when it has been performed by the B.C. Packers' Association.

L. Coste, Dominion Government engineer, has reported favorably on the proposal to construct a breakwater 1,000 ft. long at Victoria, at a cost of about $1,250,000, in preparation for the anticipated increased business on the completion of the Panama canal.

Work is reported to have been commenced on the construction of the bulkheads for the dock project at North Vancouver. The Norton Griffiths Steel Construction Co. are the contractors, while the dredging will be done on completion of the bulkheads by the Puget Sound Bridge and Dredging Co.

The Skeena River Syndicate, Haysport, Skeena River, is having a number of vessels built at Vancouver, specially designed for the fishing business on the river, the first of which was launched recently. The dimensions are—length 70 ft., breadth 16 ft., depth 8½ ft., schooner rigged with auxiliary engine of 50 n.h.p.

Press reports from Victoria recently stated that the C.P.R. had placed a contract there for the construction of a vessel 232 ft. long for its Vancouver Island service, are most likely erroneous. Probably the report refers to the s.s. Princess Sophia, which has been built in Scotland, and, at the time of writing, is on her way to the coast.

Capt. B. Johnson, of the G.T.P. Steamship Co.'s s.s. Prince Rupert, has prepared a paper on the peculiar tidal conditions prevailing in the Seymour Narrows, for the Department of Naval Service. In his opinion these have been responsible for several strandings and wrecks, the variations of rise and fall along the coast ranging from plus 23 ft. to minus 0.6 ft.

The formal transfer of the Canadian Mexican Pacific Steamship Co.'s stock to J. H. Welsford, President, Union Steamship Co., was reported to have been made, Mar. 1. T. H. Worsnop, President of the first named company, will remain with the new company as a director, and will act as joint manager with J. Beazley, of the Canadian-Mexican line. It is stated that a vessel is under construction in Great Britain, especially for the Mexican service.

Press reports state that the C.P.R. will commence on June 1 a weekly service between Victoria and Skagway, and that it will this season run a vessel direct between Victoria and Prince Rupert, calling at Goose Bay, instead of allowing its Queen Charlotte Islands and Skagway vessels to call at Prince Rupert as last season. The s.s. Princess Royal, which has been lying up for some time, will, it is stated, be hauled out on the ways at Esquimalt to have her hull scraped and to be generally overhauled.

The Pacific Coast Steamship Co. is receiving tenders for the construction of two steamships for its Puget Sound-San Francisco service, which, it is stated, will replace the present smaller steamships now operating between Victoria and San Francisco. The dimensions given are—length 417 ft., breadth 48 ft., depth 29 ft., tonnage 5,250 gross, 2,401 register; 5,000 i.h.p., bunker capacity 880 tons; dead weight cargo 2,817 tons, measurement capacity 3,367 tons. The engines must be suitable for a speed of 18½ knots an hour, and both vessels must be ready for service in 12 or 15 months.

Collection of Freight Rate Statistics from the Inland Marine.

It is the Department of Railways and Canals' intention to give effect this year to at least one important change in statistics relating to traffic on Canadian inland waters. These statistics are said to be satisfactory as far as they go; but they are defective in not disclosing the freight rate per ton per mile. For this reason it is quite impracticable to make a comparison between water and rail rates, and it is proposed to correct the situation.

The Comptroller of Statistics has notified all statistical officers in the canals service that each vessel's report must hereafter show the freight rate actually being charged on cargo. He gives the assurance that this information will be received in strict confidence by the Department, that it will not be published, but will merely be run into totals, so as to show the rate per ton per mile on the aggregate traffic passing through the canals.

The matter has been carefully considered by the Dominion Marine Association, and its Counsel, F. King, has notified the Comptroller that the members of the Association have no objection to giving instructions to the masters of their vessels to furnish the statistical officers with the rates on all bulk cargoes carried, as the Association is desirous of doing everything possible to further the Department's work in improving navigation and navigation methods, and realizes that statistics are very essential in a great many ways. In regard to the package freight trade, which is increasing very rapidly, an enormous number of manifests in the case of each cargo would have to be dealt with to get at an average rate, and consideration would have to be given to a number of charges of varying kind and extent which would be made against the rate shown in each individual manifest. To get over this difficulty it is suggested that owners would have no serious objection to furnish from these offices the net results, either of the season, or possibly each trip, of each vessel.

The Association's Counsel has also pointed out that care will have to be taken to distinguish between cases where a rate is free to the vessel and where there are unloading or discharging or other expenses to be made against it.

Dominion Marine Association.

PRESIDENT, F. Plummer, Toronto; COUNSEL, F. King, Kingston, Ont.

Great Lakes and St. Lawrence River Rate Committee.

CHAIRMAN, W. F. Wasley, Gravenhurst, Ont.
SECRETARY, Jas. Morrison, Montreal.

International Water Lines Passenger Association.

PRESIDENT, A. A. Heard, Albany, N.Y.
SECRETARY, M. R. Nelson, New York.

The Shipping Federation of Canada.

PRESIDENT, A. A. Allan, Montreal; MANAGER, AND SECRETARY, T. Robb, 526 Board of Trade, Montreal.

Ship Masters' Association of Canada.

GRAND MASTER, Capt. J. H. McMaugh, Toronto, Ont.; GRAND SECRETARY-TREASURER, Capt. H. O. Jackson, 376 Huron St., Toronto.

Among the Express Companies.

The Canadian Northern Ex. Co. has opened a waybill office at Ridpath, Sask.

The Board of Railway Commissioners has defined the collection and delivery limits for express companies in Fernie, B.C., and has extended the limits for Lethbridge, Alta., rescinding its order 15082 of Sept. 8, 1911, which fixed previous limits.

G. Kennaugh, who was charged with conspiring with J. D. Chilman, now serving sentence in connection with the recent robbery of the Canadian Ex. Co.'s office at Hamilton, Ont., has been acquitted. It is stated that an appeal for pardon will be made in Chilman's case.

The Board of Railway Commissioners issued order 16090, Mar. 8, adding another rule to the conditions of carriage and directions to agents in Express Classification 2, as follows:—A shipment tendered at a common point, which cannot be carried to its destination except through a connecting company, which connecting company also has an office at the common point, must be refused, and the shipper referred to the company which can give the through service, unless having been notified of the charges by the joint route, he requests acceptance and specifies the route in writing, in which case the shipment may be forwarded at the sum of the local rates to and beyond the transfer point specified by the shipper. The transfer point must be endorsed on the agent's receipt, and the shipper's written request attached to the waybill.

Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time we wish our readers to distinctly understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

The Canada Iron Corporation has ordered for its ore mine near Bathurst, N.B., a 300 h.p. Robb-Armstrong horizontal Corliss engine and a 72-in. return tubular boiler.

The C.P.R. has ordered two Robb-Armstrong vertical enclosed compound engines direct-connected to 175 k.w. electric generators supplied by the Canadian General Electric Co., to be installed in the Hotel Vancouver, and to operate at 400 revolutions a minute. Each engine is to be equipped with a pressure oiling system which will maintain oil on all the bearings under 15 to 20 lbs. pressure per square inch.

Clark, Lyford and Sterling, a new firm of forest engineers, have opened offices in Philadelphia, Pa. The members are J. F. Clark, Vancouver, B.C.; C. A. Lyford, Montreal, Que., and E. A. Sterling, Philadelphia. Messrs. Clark and Lyford are also members of the firms of Clark and Lyford, Vancouver, and Lyford, Clark and Lyford, Montreal. Mr. Sterling has resigned his position as Forester of the Pennsylvania Rd., which he has held for the past five years. This organization is making a specialty of timber estimates and forest maps, and is prepared to examine and report on timber properties anywhere.

P. A. Hinds, the Ohio Brass Co.'s travelling representative in Canada, who was knocked down by an automobile in Toronto towards the end of February and badly injured, and who was taken to the General Hospital, where two operations had to be performed, is convalescing satisfactorily, but it is likely to be some little time before he is able to resome duty. He left Toronto Mar. 21 for Muncie, Ind. The Ohio Brass Co. has issued a circular to its Canadian customers, asking them, until Mr. Hinds is able to travel again, to send enquiries and orders direct to it at Mansfield, Ohio, where they will receive prompt attention. A salesman will be sent from Mansfield or one of the branch offices to care for special enquiries.

Stuart, Drinkwater and Hingston, Ltd., has been incorporated under the Dominion Companies Act, with office in Montreal. The new company will represent for Canada the Brush Electrical Engineering Co., dealing in its complete line of electrical machinery, electric rolling stock and electric supplies. It will also represent A. W. Penrose and Co., of London, Eng., manufacturers of the Penrose electric elevators. The company will take over the Canada Ford Co., Ltd., of which company C. A. Stuart is President; K. E. Drinkwater, Vice President, and H. R. Hingston, Secretary-Treasurer, these three constituting the sole shareholders of the companies. Mr. Stuart commenced his business career with the Bell Telephone Co. of Canada, being Assistant Purchasing Agent until the company disposed of its Manitoba plant to the Provincial Government, when he went west to conclude the arrangements. Almost immediately after his return to the east, he entered into partnership with E. H. Ford and K. E. Drinkwater, under the name of the Canada Ford Co., H. R. Hingston joining the firm later. In Sept. last Messrs. Stuart, Drinkwater and Hingston acquired the interests of Mr. Ford, who retired from the business. Mr. Drinkwater started his business life with Allis-Chalmers-Bullock, Ltd., leaving it to join the Canadian Fairbanks Co., which company he left to enter into partnership with Mr. Stuart. Mr. Hingston's entire business career has been with the Canada Ford Co.

Transportation Conventions in 1912.

May 7-10.—Air Brake Association, Richmond, Va.

May 10-11.—American Association of Demurrage Officers, San Francisco, Cal.

May 14.—Railway Industrial Association, Kansas City, Mo.

May 14-17.—Master Boiler Makers' Association, Pittsburgh, Pa.

May 15.—Freight Claim Association, Buffalo, N.Y.

May 15.—American Association of General Baggage Agents, New York City.

May 15.—American Railway Association, New York City.

May 20-22.—Railway Storekeepers' Association, Buffalo, N.Y.

May 21-23.—Association of Railway Claim Agents, Los Angeles, Cal.

May 22-25. — International Railway Fuel Association, Chicago, Ill.

June 12-14.—Master Car Builders' Association, Atlantic City, N.J.

June 16-18.—Wood Preservers' Association, Chicago, Ill.

June 17-19.—American Railway Master Mechanics' Association, Atlantic City, N.J.

June 18.—Train Dispatchers' Association of America, Louisville, Ky.

June 18-21.—American Association of Freight Agents, Detroit, Mich.

June 24.—Association of Railway Telegraph Superintendents, New York City.

June 25, 26.—Association of Transportation and Car Accounting Officers, Bluff Point, N.Y.

June 26.—Association of American Railway Accounting Officers, Quebec, Que.

July 23-26.—International Railway General Foremen's Association, Chicago, Ill.

Aug. 15.—International Railroad Master Blacksmiths' Association, Chicago, Ill.

Aug.—Travelling Engineers' Association.

Sept. 10-12.—Roadmasters' and Maintenance of Way Association, Buffalo, N.Y.

Sept. 10-13.—Master Car and Locomotive Painters' Association of United States and Canada, Denver, Col.

Oct. 7-11.—American Electrical Railway Association, Chicago, Ill.

Oct. 15-17.—American Railway Bridge and Building Association, Baltimore, Md.

Oct. 17-19.—American Association of Dining Car Superintendents, Denver, Col.

Nov. 6-10.—Association of Railway Electrical Engineers, Chicago, Ill.

Nov. 15.—American Railway Association, Chicago, Ill.

Dec. 12-13.—Association of Transportation and Car Accounting Officers, Louisville, Ky.

The P. Lyall and Sons Construction Co. has been organized under the Dominion Companies Act, with a total capitalization of $4,300,000, and office in Montreal. An issue of $1,250,000 of 20-year 6% first mortgage gold bonds, with 25% bonus of common stock, was placed on the market recently at 96. The directors are: P. Lyall, W. Lyall, T. Lyall, J. N. Greenshields, R. Mackay, H. W. Beauclerk, Montreal. The company has been licensed to do business in Ontario, using a capital not exceeding $40,000, G. G. McCullough, Toronto, being its attorney.

Telegraph and Cable Matters.

The C.P.R. Telegraph Department has opened offices at Eau Claire and Grand Valley station, Ont.; Bergen, Man.; Druid, Silton, Holdfast and Keddleston, Sask.; Standard, Alta., and Galloway, B.C.

The Dominion Government has established wireless telegraph communication between Pictou, N.S., and the Magdalen Islands. The service, which at present will be limited to the sending of news, weekly, will be operated by the Post Office Department.

The British Government has accepted the Marconi Wireless Telegraph Co.'s terms for the erection of long distance wireless telegraph stations at London, Egypt, Aden, Bangalore, Pretoria, Singapore and other points, to link up the various scattered parts of the empire. The Government will pay the company $300,000 for each station and 10% of the receipts for 28 years.

The British Postmaster General in a speech in London, Eng., Mar. 13, is reported to have stated that, before long, the Government would obtain control over all the cable business. It is stated in the dispatch that this statement is understood to have reference to the lapsing of landing licenses at an early date, and which can only be renewed on the condition that the Government shall have control of the rates to be charged.

Following on the leasing of the Anglo-American and Direct United States Cable companies' systems by the Western Union Telegraph Co., the eight trans-Atlantic cables of the three companies have been consolidated under one management, and are known as the Western Union Cable System. The European headquarters are at the Anglo-American Bldg., New Broad St. London, Eng., and the American headquarters at the Western Union Bldg., 195 Broadway, New York. J. H. Carson has been appointed General Operating Manager, London, Eng.; T. W. Goulding, European Commercial Manager, London, Eng., and J. C. Willever, United States Manager, New York. Mr. Goulding was at one time in telegraph service at Winnipeg.

The Leahy Engineering and Contracting Co. has been incorporated under the Dominion Companies Act, with the capital of $20,000, and office at Montreal, to carry on a dredging and general contracting business. The provisional directors are: J. H. Leahy, G. Bourdeau, J. E. Morier, E. H. Godin, Montreal; J. G. de Lorimier, Westmount, Que.

The Canada Central Construction Co. has been incorporated under the Dominion Companies Act, with a capital of $300,000 and office at Montreal, to carry on a railway and general contracting business. The provisional directors are: F. Dufresne, St. Laurent, Que.; J. W. Le Pailleur, A. S. Laplante, R. Carignan, Lachine, Que.; J. A. P. Descarries, Montreal.

Western Canada Railway Club.—At the regular meeting in Winnipeg, Mar. 11, a paper on foundry practice, prepared by A. Knight, foreman at the Canadian Northern Ry. shops, was read in his absence through illness in his family, and J. G. LeGrand, Bridge Engineer, G.T. Pacific Ry., showed a series of lantern slides picturing bridge and other construction work on the G.T. Pacific Ry.

The International Supply and Construction Co. has been incorporated under the Dominion Companies Act, with a capital of $100,000 and office at Hull, Que., to carry on a railway and general contracting business, and to deal in contractors' plant and machinery. The provisional directors are: D. Chene, P. Wilson, H. P. Dupuis, I. V. Couture, Hull, Que.; W. J. Code, Ottawa.

Canadian Collieries (Dunsmuir), Ltd.—The report for the past year shows that the properties acquired included all the coal in and underlying some 1,900,000 acres of land, known as the Esquimalt and Nanaimo Ry. Co.'s land grant, together with the operating mines, railways, shipping docks and certain timber lands, in addition to other small areas not included in the land grant. During the year contracts were made for railway coal tonnage in Mexico, and this field is being thoroughly investigated to secure the best results possible. With the nearness to completion of the Panama canal the directors look forward to greatly increased business.

Electricity continues to be the supreme power for urban and suburban railway service, and note should be made of the fact that the Edison storage battery cars which have been operating during the past year in New York city have been giving reliable and satisfactory service. The application of electric traction to steam roads is not making the progress which was expected when the New York Central and the New Haven and Hartford installations had proved how reliable and punctual a service could be given. Figures of cost are difficult to obtain, but, as the report on the proposed electrification of Boston suburban roads showed, the first cost of these changes from steam to electric power is so great as to discourage investments of this character. There is a consensus of opinion that the alternating-current, overhead trolley will be used for long distance service, and the direct-current, third-rail system for terminal and suburban work.

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Packings	Packing Expander Ring	Asbestos Wood	Rail Bonds and Tools
Gaskets	Underground Conduit	Fibre Conduit	"Noark" Fuse Devices
Hair Felt	Leak-No Metallic Compound	Insulation	Fuse, Service & Subway Boxes
Cements	Fire Extinguishers	Metal Polish	etc., etc.

WRITE NEAREST BRANCH FOR CATALOG No. 252.

THE CANADIAN H. W. JOHNS-MANVILLE CO., LIMITED
Toronto, Ont. London, Ont. Montreal, Que. Winnipeg, Man. Vancouver, B.C.

THE GRAND TRUNK RAILWAY COMPANY OF CANADA.

NOTICE is hereby given, that the ordinary general half-yearly meeting of the Grand Trunk Railway Company of Canada will be held at the City Terminus Hotel, Cannon Street, London, E.C., on Thursday, the 18th April, 1912, at twelve o'clock noon precisely, for the purpose of receiving a report from the directors, for the election of directors and auditors, and for the transaction of other business of the company.

Notice is also given, that the transfer books of the company in London and Montreal will be closed from Saturday, the 16th day of March, to the day of meeting, both days inclusive.

By order,
ALFRED W. SMITHERS,
Chairman.
H. H. NORMAN,
Secretary.

Dashwood House, 9 New Broad Street, London, E.C., 9th March, 1912.

NOTICE.

The General Railway Signal Company, the owners of the exclusive rights to Canadian patents No. 92323, No. 96127, No. 96256, and No. 97758, issued to Young and Townsend, and covering methods of signalling electrical railways, wishes to call the attention of all possible users of the devices and systems covered by such patents, to the fact that it is prepared to sell and furnish, at short notice, [illegible] devices and to install such systems upon any railway in the Dominion of Canada.

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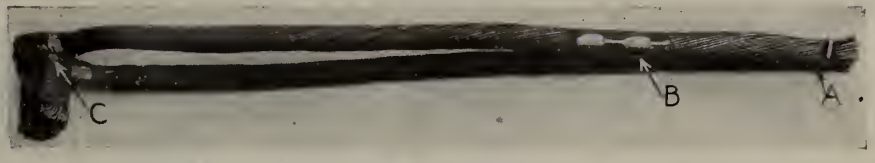

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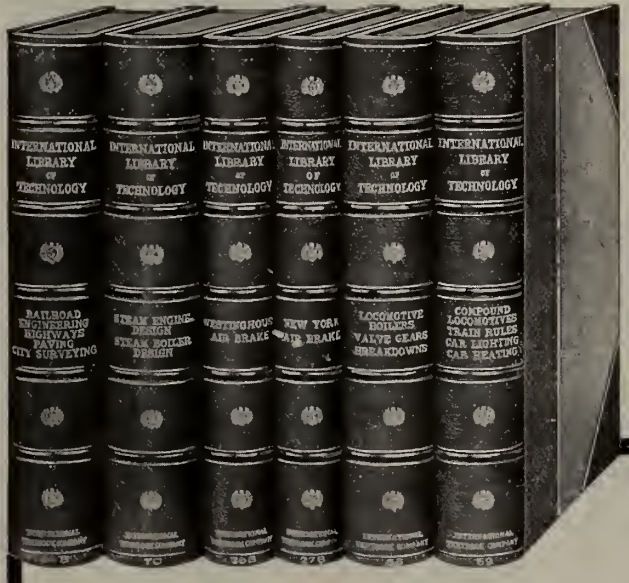

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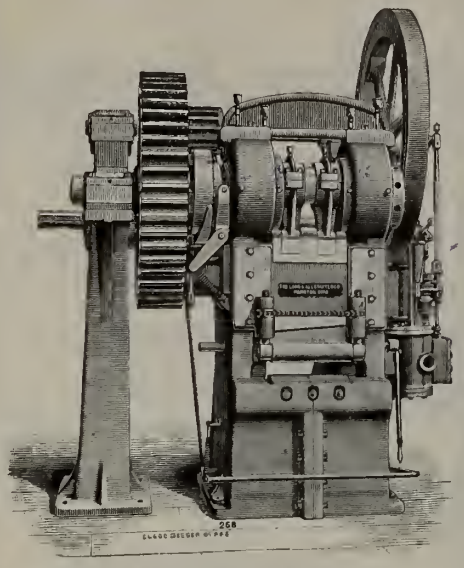

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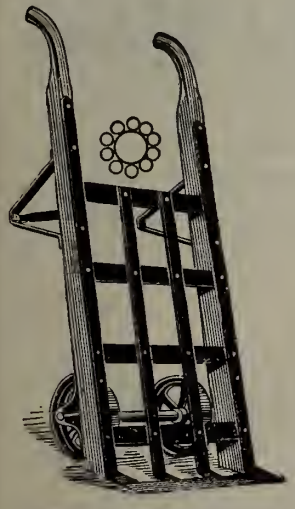

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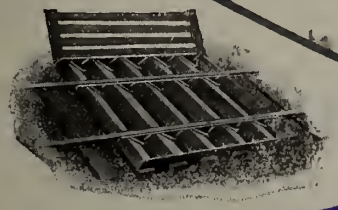

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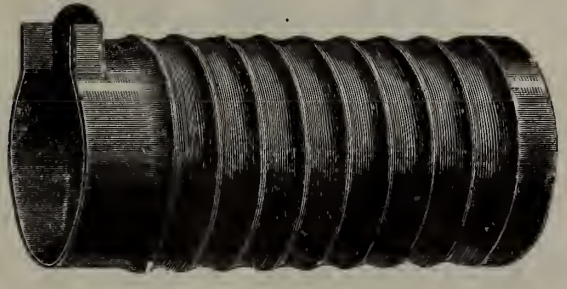

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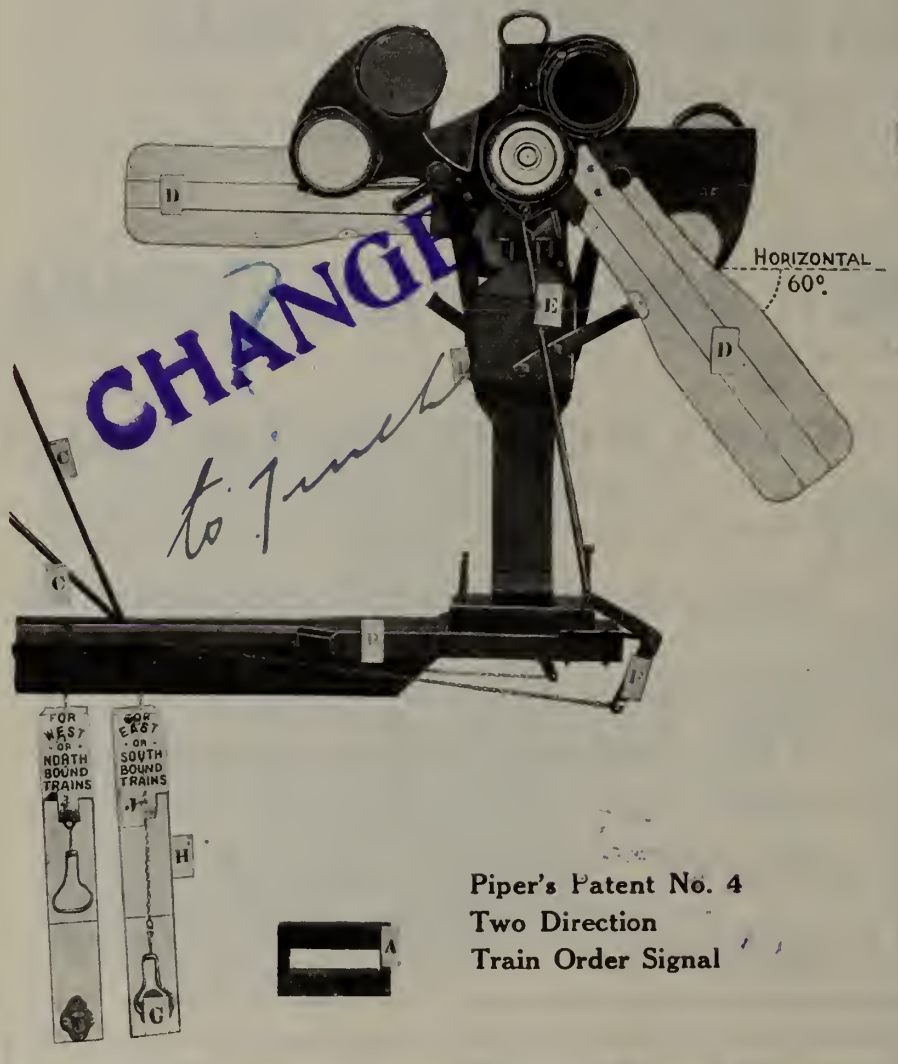

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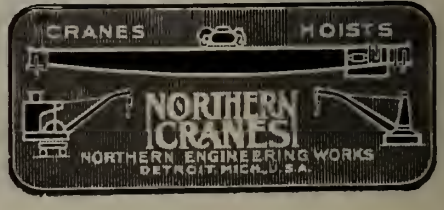

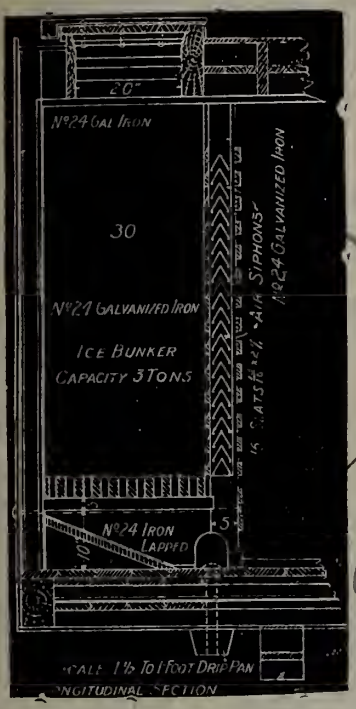

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Dominion Equip. & Supply Co..Winnipeg
Locomotives, Electric
Baldwin Locomotive Works..Philadelphia
Canadian Gen. Elec. Co., Ltd. ....Toronto
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Locomotives, Logging
Baldwin Locomotive Works..Philadelphia
Canadian Locomotive Co...Kingston, Ont.
Locomotives, Rack
Baldwin Locomotive Works..Philadelphia
Canadian Locomotive Co...Kingston, Ont.
Montreal Locomotive Works .....Montreal
Locomotives, Steam
Baldwin Locomotive Works..Philadelphia
Canada Foundry Co., Ltd.
Canadian Fairbanks-Morse Co...Montreal
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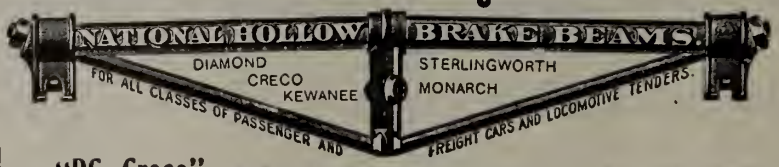

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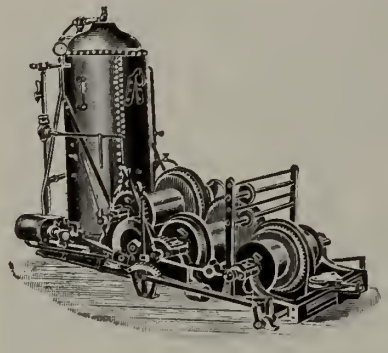

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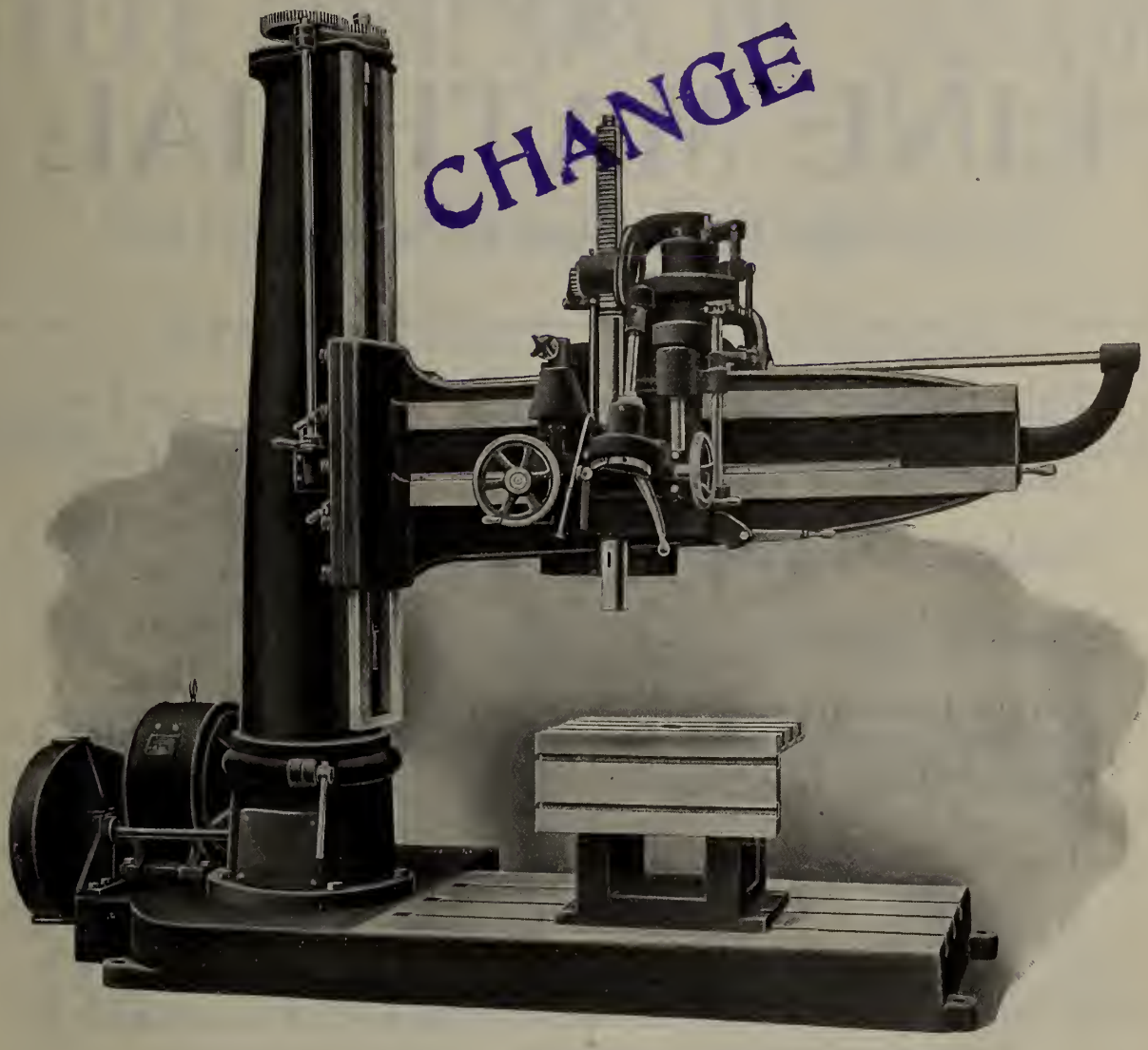

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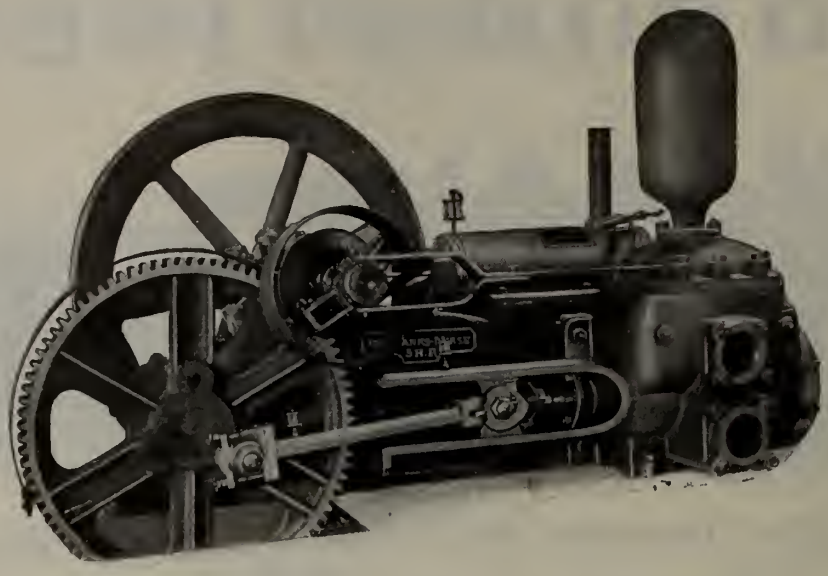

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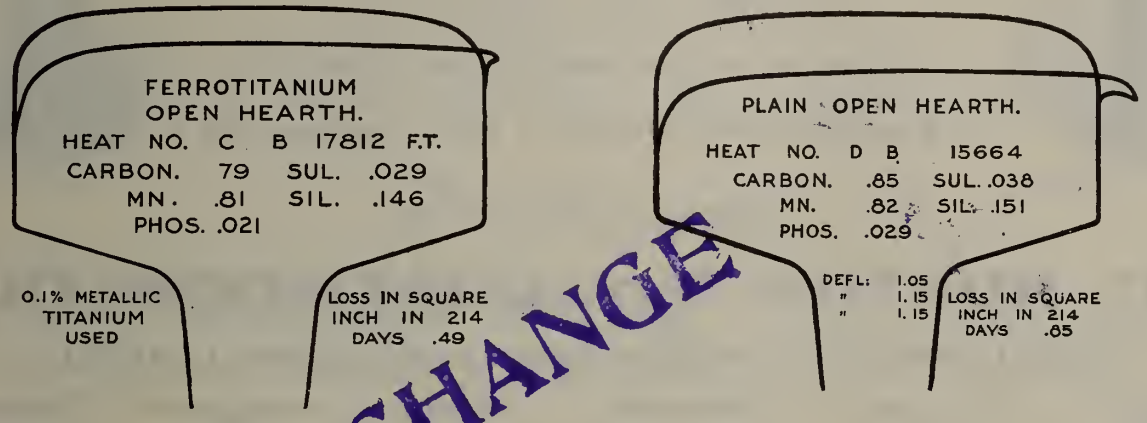
—Specify Titanium Rails on your curves and save money, as the Boston Elevated is doing. Read carefully these rail diagrams for part proof of Titanium superiority.



CONDITIONS OF TEST

All rails A.S.C.E. Section, 85 lbs. per yard.
Laid April 1st, 1911.
Measured October 31st, 1911.
In service when measured, 214 days.
Test rails laid alternately on high side of track.
Radius of curve, 100 feet.
Grade, 5 per cent. down.
Track elevation, 3 inches.

Average wear in square inch (for all rails)

	Open Hearth	Ferrotitanium
In 214 days,	.755	.537
Per 1,000,000 tons, (approximately)	.0686	.0488

Ratio of Wear
For all Rails
Ferrotitanium to Open Hearth
1 to 1.41

This is only one of many actual-service tests that have proved the superiority of Titanium Rails. And when you consider that they cost only about $2.00 more per ton than plain open hearth or Bessemer rails, you can easily see the advantage of specifying Titanium Rails—not only on curves, but also on every part of your road.

Ask us to send you Booklet No. 30 with diagrams giving detailed results of rail tests on leading steam and electric roads.

Titanium Alloy is made for Canadian consumption by Electro-Metals, Ltd., Welland, Ont.

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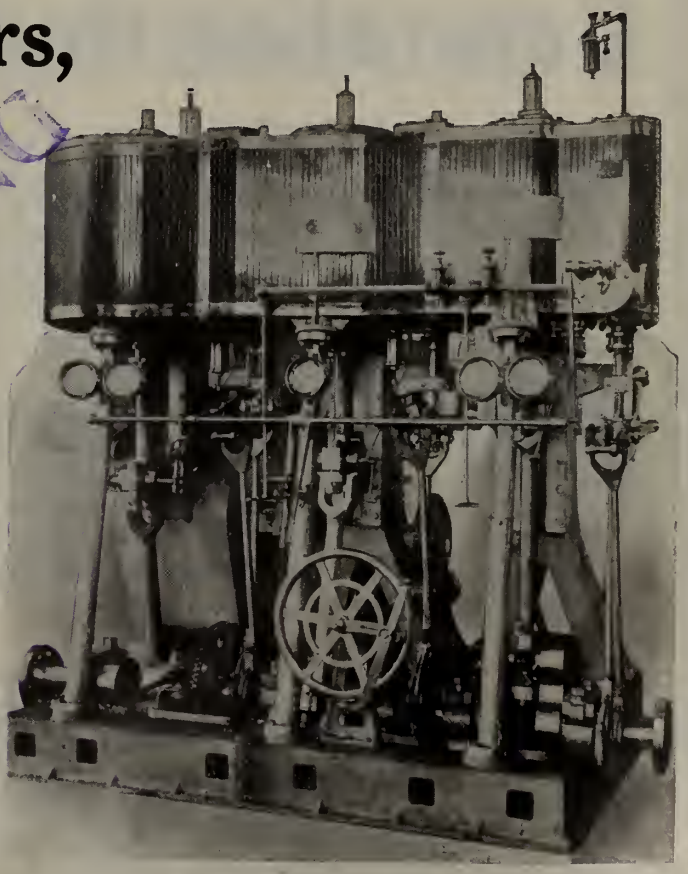

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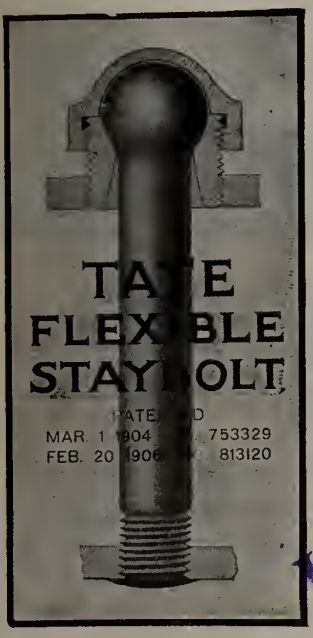

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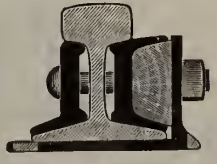
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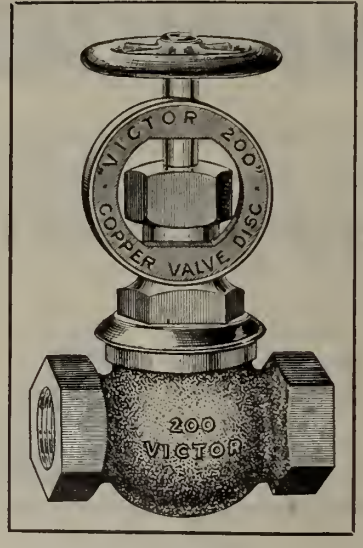

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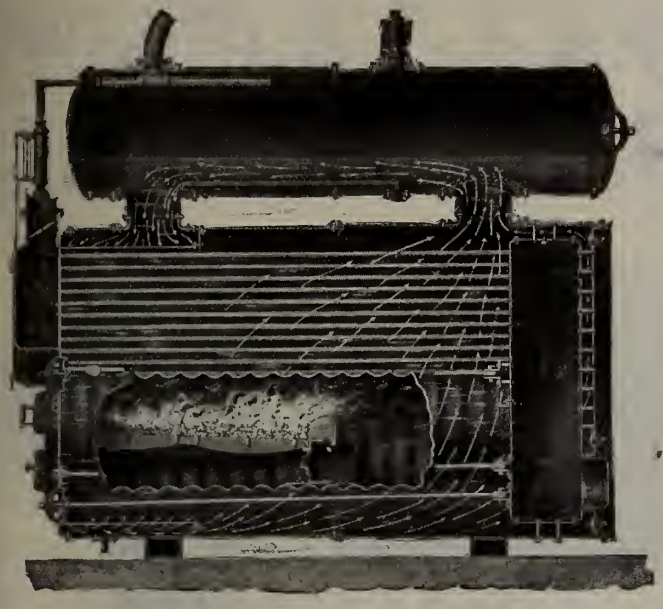

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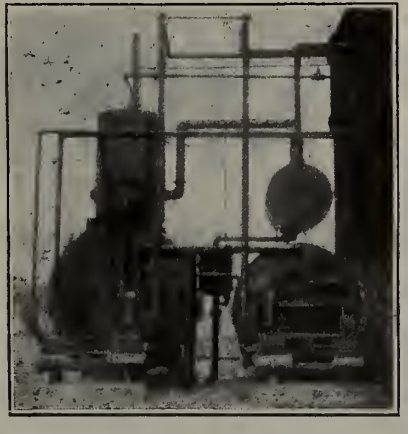

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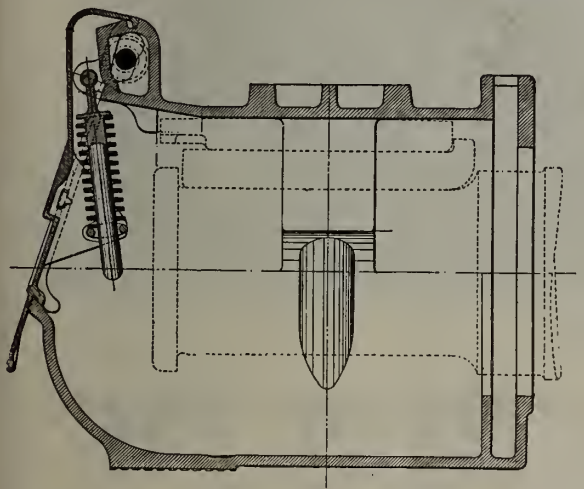

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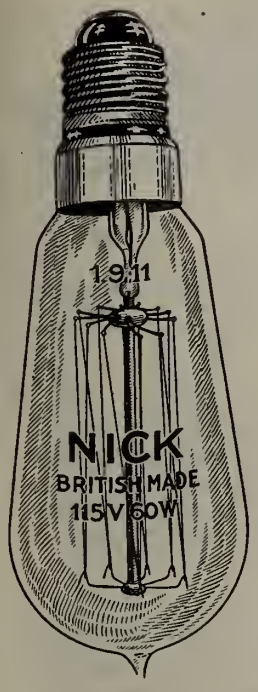

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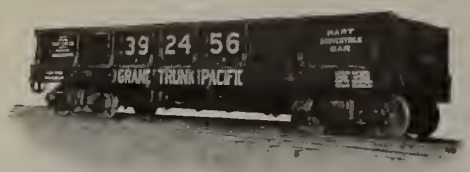

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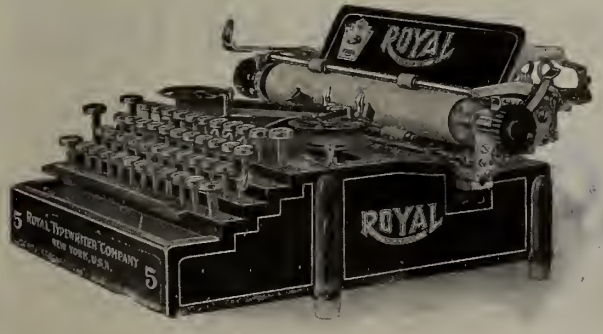

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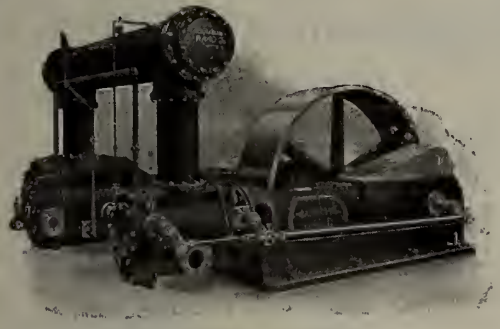

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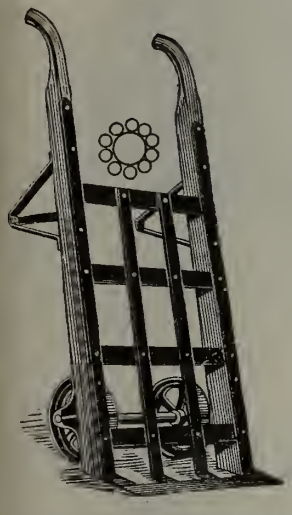

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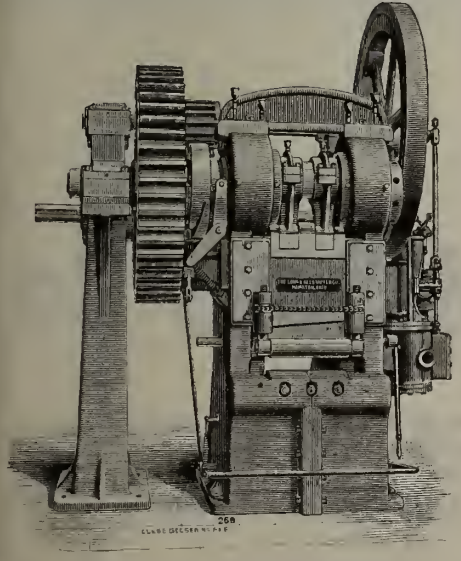

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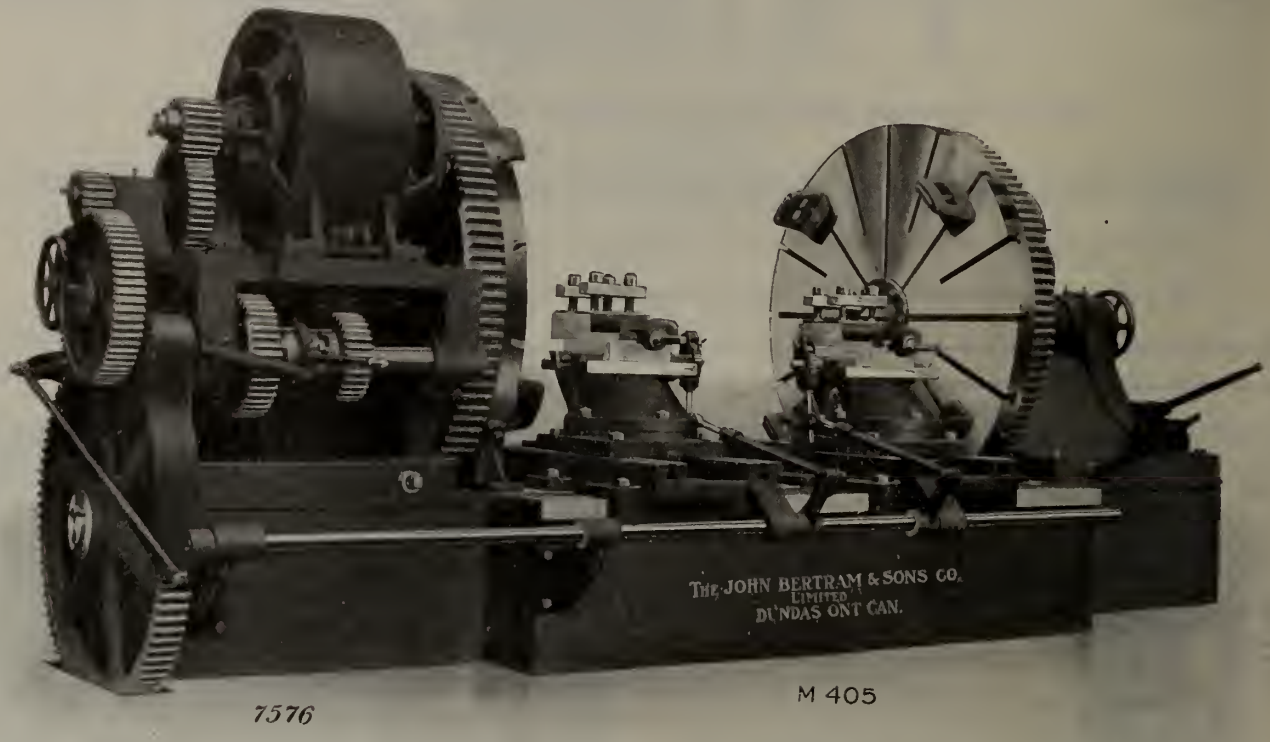

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The Railway and Marine World

May, 1912.

The Grand Trunk Railway Grade Separation Work at Toronto.

The grade separation work on the G.T.R. near the western outskirts of Toronto on the Toronto-Hamilton section of the main line is rapidly nearing completion, work for the spring having been resumed recently. At the rate in which the work is being pushed to completion it will be finished in July or August. This portion of the work includes only the section from Strachan Ave. westerly, the viaduct through the city forming another part of the comprehensive scheme of level crossing elimination along the Toronto waterfront

The section here referred to may be divided into two subdivisions, the first of these extends from Strachan Ave. to Sunnyside, consisting of one long cutting, at places as much as 27 ft. deep, and the second extends from Sunnyside to Mimico. the western terminus of the grade separation as at present contemplated. This second section is almost entirely elevated on an embankment, the highest point being about 16 ft. above the former level.

The construction work was simplified to a considerable degree by the fact that the new grade is to have four new tracks instead of the two through tracks of the former level. The wider right of way made possible the construction of the roadbed half at a time, the other half being used temporarily for the construction machinery.

The Railway and Marine World for Aug., 1911, contained profiles of the grades as they formerly existed, and as they are to be eventually with a short description covering the scope of the work. This profile, fig. 2, together with a brief recapitulation, is here given for the benefit of those not aware of the scope of the work which is being carried out by the G.T.R. in conjunction with the city under the Board of Railway Commissioners orders. In order to fully carry out the plan of level crossing elimination, it was found necessary to extend the separation work as far as Mimico, a total length of about six miles. The maximum gradients on the old line was 0.7%, while that of the work under construction is 0.4%.

At Dufferin St. the new rail level will be about 22 ft. lower than the old; at Dunn, Jamieson and Dowling Aves., it will be 25 ft. lower; in all these cases the highway is to be carried across at practically street level. At Sunnyside, the rail level is to be raised 4½ ft., with the highway carried on an overhead bridge with long approaches, a few hundred feet east of the present crossing. From Sunnyside to Ellis Ave., the track will be 14 ft. higher, with subways at Indian Rd., Howard Ave., Ellis Ave., Windermere Ave.. Jane St., Queen St., near the Humber River; Salisbury Ave. and Church St., Mimico. The tracks across the Humber will be carried on a 4-track deck girder bridge of two spans, the centre resting on a pier sunk in the centre of the river.

The section of the work extending from Strachan Ave. on the east to Sunnyside, as the profile in fig. 2 indicates, extends through a heavy cutting all the way. In the former construction the right of way through the major portion of the distance, carried only two tracks, the section near the easterly end along the frontage of the National Exhibition grounds. where there are several sidings, being the only part with more than the two. It was found that to maintain traffic and carry on the construction work the same amount of right of way would be required for two as for four tracks; it was therefore decided to obtain the additional right of way and finally build four tracks throughout nearly the whole of the length of this section. The width of the right of way was increased on the southerly side

As the prime requisite was that train service should in no way be interfered with, special provisions had to be made with this end in view. Close alongside of the northern fence of the right of way, two temporary tracks were laid, as indicated to the extreme right in fig. 3, and on to these the traffic was diverted. This left all the new right of way strip, together with a good portion of the old right of way, clear for the excavating operations. The plan adopted was first to dig a cut of sufficient width to depress two of the ultimate four tracks, and after the completion of these two tracks, to divert on to them the traffic from the temporary tracks on the edge of the embankment, and then proceed with the excavation through the ground on which the temporary tracks stood, for the depression of the two northerly tracks.

In view of the fact that the maximum cutting ran as high as 27 ft. and the capacity of the shovels was only 10 ft. deep at a setting, it was necessary to work the cuttings in three levels. Commencing at both ends of the cutting on the southerly edge, the shovels ate their way into the cutting, working towards each other. A temporary track on the north embankment of the steam shovel cutting was advanced simultaneously with that of the steam shovel for the accommodation of work trains. In this manner excavation on the three levels was pushed successively to completion. Up to July 1, 1911, there were two shovels at work, and from that time on until the close of the season, early in

Fig. 1. Looking West from Dowling Avenue Bridge, Dec. 1, 1911.

December, there were three. From 10 to 12 work trains were employed in removing the earth to the embankments under construction concurrently near the Humber end. The work at Dowling Ave, as it appeared June 18, 1911, is shown in fig. 3. It will be noticed that two levels had been partially put down. This illustration also shows the method of working to these levels, that on the left being the first to be lowered, followed by that in the centre, which will extend over the left portion, and finally lower these two levels to the proper depth. The temporary tracks on the embankment at the extreme right meanwhile divert the regular traffic.

Last autumn the double track cutting having been depressed to the required depth, the traffic from the upper temporary tracks was again diverted, this time on to tracks laid permanently at the bottom of the cut, as shown to the left in fig. 1, which is a view looking west towards Sunnyside from the temporary Dowling Ave. bridge. Work then proceeded on the depressing of the northerly half of the right of way, which is also to be seen in fig. 1. This shows the method of performing the work and illustrates the manner in which it was pushed, the two shovels working right up to each other, and fighting, so to speak, for the last shovelful.

Fig. 4 shows the same spot as that in fig. 1, and was taken at the same time, Dec 1, 1911, from a point a little further east. It illustrates the type of temporary bridge used to carry highways across the cutting while operations were in progress. A finished abutment for the final bridge is also shown. It will be noticed on the date mentioned, which was shortly previous to the suspension of work for the winter, the second pair of tracks had been nearly lowered to their final position, leaving but little excavation work to be carried on this spring.

The semi-finished cutting, looking east across Dunn Ave., on the same date, is shown in fig. 5. This also shows the temporary bridge, completed south side embankment and bridge abutment. The most interesting point shown in this illustration is the method of carrying the gas main temporarily across the excavation. A cable, carried on posts on each side of the bridge, supports at intervals the elevated pipe line. The clean-cut appearance of the slope as it will finally appear on completion, is well shown in this illustration by referring to the appearance of the right-hand embankment. This slope will later be covered with turf.

With the exception of that portion of the cutting along the face of the exhibition grounds, which section is shown in fig 6, the whole cutting has sloping earth embankments, battered 1½ to 1. At the exhibition grounds, however, the impossibility of procuring sufficient ground to give a sloping embankment, made necessary the use of a retaining wall, constructed of reinforced concrete of the form indicated. Some of the top moulds in place, with the method of raising the concrete by elevator, are shown in this illustration. The bridge abutment in the foreground is that for the Dufferin St. bridge, leading into the exhibition grounds, and in consequence is to be made larger and more elaborate than the balance of the overhead bridges through this South Parkdale district. A more simple method of carrying the gas main across is here shown. The easterly limit of the cutting is also shown in the distance. The portion shown is the only part of the cutting to have a retaining wall.

The westerly end of the long cutting skirts the edge of the lake, as may be noticed in the distance in fig. 7. In fact, part of this work only required the reduction of the face of the cliff above the shore, the major portion of the additional right of way being obtained by building outward over the shore.

Sunnyside, the point of division between the elevation and depression of the tracks, is to have an overhead bridge with long approaches. In fig. 7, a view looking easterly across Sunnyside, shows the present level crossing of the highway on the left The roadway for the new bridge is to be diverted so as to cross the tracks some distance further east, the northerly end coming out at the junction of King and Queen Sts. Forming part of this scheme, the roadway to the right in this illustration, is to be moved further in that direction, long approaches leading the roadway up to the bridge. As will be noticed to the right of the present highway, a trestle alongside of the road carries tracks leading from the cuttings further along, from which the work trains discharge their loads for building up the roadway approaches to the new bridge. The approach leads in a straight line to an abutment at the proper elevation, from which point the bridge curves off to the left over the tracks to the beforementioned point. The portion of the right of way in the immediate foreground in fig. 7 has not as yet been altered. When the highway is diverted to its final location on the right, the railway right of way will extend over the present position of the highway.

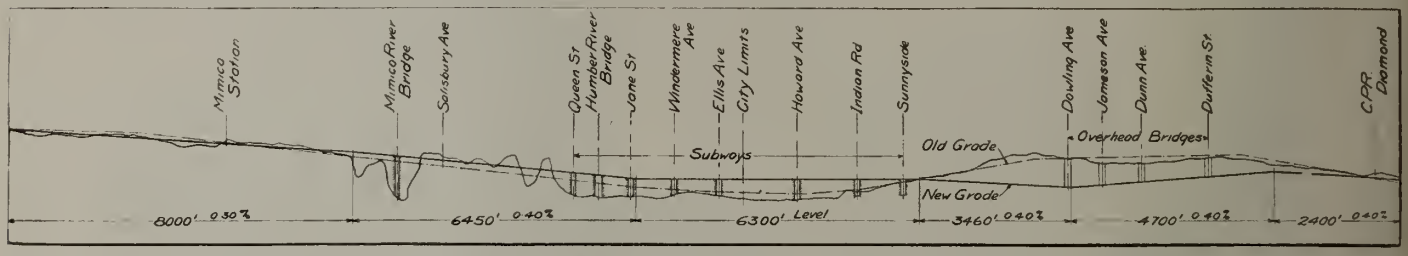


Fig. 2. Profile of G.T.R. Grade Separation Zone from Strachan Avenue, Toronto, to Mimico.

Fig. 3. Looking West, at Dowling Avenue, June 18, 1911.

From Sunnyside to Mimico there is one long embankment. Previous to this change in grades, there was a small double track embankment from Sunnyside to the Humber River. The first operation, therefore, was to extend the embankment sufficiently northward to receive two tracks on the same level, on which temporary tracks were laid to carry the diverted traffic With the exception of a short portion near Swansea, the elevated track is on an embankment. At the point mentioned, owing to the presence of buildings to the north cramping the right of way over towards the roadway, a concrete retaining wall of full height was required. Behind this wall and along this roadbed from Sunnyside to the Humber, the old embankment was raised by the excavated material from the easterly end of the work. This filling work was accomplished by means of a temporary trestle raised to the required height over the roadbed

At the Humber, a new four-track deck plate girder bridge, having 2 spans, was built, 100 ft. each. While this bridge was under construction the two main lines from the high level on either side of the Humber were carried across on the old truss immediately north of the new bridge by means of ramps.

Near Sunnyside, as mentioned before, and as illustrated in fig. 7, the two northerly tracks alone have been elevated in anticipation of the use of the present highway for part of the roadbed when the highway is diverted to its ultimate location. Fig. 8 shows how the southerly ends of the subway abutments have been left for final completion when the property for the completion of the two final tracks at this point is available. This illustration also shows the way in which the elevated tracks were temporarily carried across the highways before the steel bridges were finally placed. The manner of performing this latter operation and the type of subway bridge used are shown in fig. 9.

This work is under the charge of J. R. W. Ambrose, Assistant Engineer, and D. McCooe, Superintendent of Grade Separation.

Other illustrations in connection with this grade separation work, will be found on pages 213, 214 and 215.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.

Summary of the Year's Investigations of the Various Standing Committees.

During the past year the Association's various standing committees have been continuing their investigations along the lines followed in the past, and have made a number of studies of new subjects, looking toward the establishment of uniformity in maintenance of way standards and the outlining of good practice in the work of that department. A summary of the work of the committees is given in the following account. The action of the convention held in Chicago recently establishes certain of the conclusions and recommendations embodied in these reports as the approved practice of the association.

Fig. 4. G.T.R. Grade Separation. Dowling Avenue Bridge, Dec. 1, 1911.

Committee on Roadway

The work of this committee consisted of further investigations leading to the presentation of formulas of general application for the determination of waterway areas; a study of allowable unit pressures on roadbeds of different materials conferring with the committee on ballast; a study of tunnel construction and ventilation; and an investigation of agricultural drainage as affecting roadbeds. The first subject has been under consideration for several years and a considerable amount of data has been collected, and a general relationship also found between the best known waterway and runoff formulas. Since the previous convention the committee has directed its attention to the hydraulic features of the culvert, and reports progress, but does not go so far as to make any definite recommendation.

The committee has collected a considerable amount of additional data relative to the bearing power of soils, which is included in the report, and also presents a mathematical analysis of the action of pressures on soil composing a railroad subgrade based on Rankine's analysis of earth pressures. In this connection a form of field test of railroad subgrade material is suggested.

The committee has confined its attention to ventilation of tunnels in connection with the third subject. No definite conclusion has been reached, but the opinion is held that artificial ventilation is usually unnecessary in American steam railway tunnels of lengths less than 2,000 to 2,500 ft. The report states that probably the most efficient form of artificial ventilation for tunnels is to force air into one end by fans powerful enough to drive the smoke out ahead of the train. This system has been installed in several tunnels in this country, which are listed in the report. Experience with the clearing of smoke in several tunnels of the Louisville and Nashville Rd, is also discussed.

During the past two years the committee has collected information as to the drainage laws of various states, but finds that since they are frequently changing and difficult of useful application without reference to the companies' attorneys, it seems impracticable to employ them. Consequently the committee suggests that its further work along this line be directed toward the benefit to the roadway to be derived by the construction of agricultural drainage work.

Committee on Ballast

This committee has been engaged in work leading to the determination of the proper depth of ballast for uniform distribution of loads on the roadbeds; on the fixing of physical tests of stone for ballast; and in the preparation of a review of the use of gravel ballast.

Fig. 5. G.T.R. Grade Separation. Dunn Avenue Bridge, Dec. 1, 1911.

As a part of the investigation of the proper depth of ballast the committee presents references to published accounts of investigations of this subject, calling particular attention to the experiments recently conducted on the Pennsylvania Rd. From its study of the data available the committee concludes that with ties 7 x 9 in. x 8½ ft. spaced about 24 to 25½ in. on centres, a depth of 24 in. of stone ballast is necessary to produce uniform pressure on the subgrade and a combination of a lower layer of cinder ballast, 18 in. to 14 in. in depth, and an upper layer of stone ballast, 6 to 10 in. in depth, approximately 24 in. deep in the aggregate, with the same spacing of ties, will produce nearly the same result.

In regard to physical tests of stone for ballast, the committee reports an additional compression test, which the U S. Office of Public Roads will make for the railways, and which it presents for addition to the other tests adopted in 1910. The committee advises that the description of the physical test, together with instructions for providing samples and blue prints of machines used, may be obtained by writing to the Department of Agriculture at Washington.

In its review of the use of gravel ballast the committee presents the results of determinations by a number of railways of the percentage of sand, gravel, dust and clay in the ballast used. This information is tabulated in the report, together with brief statements of the practice of a number of roads and the results which are being obtained by them from the use of gravel ballast. A description of the new gravel-washing plant of the Richmond, Fredericksburg and Potomac Rd. is presented as an appendix.

In view of the wide variation found in the character of ballast which is reported to give good results, the committee considers further investigation of this subject desirable.

In the discussion on this report one point brought out as bearing on the experiment on the Pennsylvania Rd. to determine the depth of stone ballast and stone ballast underlaid by cinders, being the experience of the Santa Fe with deep cinder ballast, which was later replaced with slag, the latter requiring much subsequent attention due to the settlement of the cinders beneath it. It was pointed out that here the composite ballasting showed up well in experiment but not in practice.

It was decided to make the following additions to, or changes in, the association's approved practice:—

A definition of the depth of ballast as the distance from the bottom of the tie to the top of the subgrade.

A standard compression test for stone to be used for ballast, this test to be added to the physical tests of stone for ballast already adopted by the association.

In addition to the adoption of these recommendations, endorsement was given to the conclusions of the committee on its study of the necessary depth of ballast for even distribution of loads.

Committee on Ties

This committee has had under consideration the subject of size of cross-tie

required for present stresses; the advisability of tie renewals in continuous stretches as compared to single-tie renewals; and experience with metal, composite and concrete ties. A large amount of information has been collected on each of these subjects and is included in the report.

Replies to a circular asking opinions as to the size of ties were received from roads representing about one-third of the total mileage in the association. From extensive tabulations of this material in the report it is found that there has been an increase in the number of ties used per 30 ft. rail since 1905, the rail-bearing area now being about 40%, as against 35½% in the former year. It also appears that about 59% of the mileage reporting in the circular is of the belief that a 6 x 8 in. x 8 ft tie is too small and 96% of that mileage considers a larger tie desirable. It is found that 22 sizes of cross-ties are now in current use, with 47% of the mileage reporting using the 6 x 8 in. x 8 ft. size. It is pointed out that the sentiment is evidently in favor of a larger tie, but evidently the length has not been considered as much as the width and depth. Of the mileage reporting 18% uses a tie 8½ ft. in length and over 10% favors a tie 7 x 9 in. x 8½ ft., none favoring 6 x 8 in. x 8½ ft.

In connection with this discussion a table is presented which shows the superior strength of air-dried timber for ties as compared to that of green ties. A list of articles is appended relating to the size of cross-ties and the stresses to which they are subjected.

The committee draws the conclusion that it is not feasible to make a fixed rule for the size and spacing of ties based on the A, B and C classification of density of traffic due to the variation in the character of the subgrade, ballast, axle loads, tie timber and other considerations. In general, however, it is considered good practice for class A and perhaps class B roads to space ties 10 to 12 in. face to face, the width of tie being considered not so important with this spacing, provided that the minimum width of face of the ties is limited to 7 in.

The investigation relative to the advisability of renewals of ties in continuous stretches against single-tie renewals showed almost universal endorsement of single-tie renewals. Continuous renewals at station platforms, street crossings and similar places are favored by some. It is recognized that there would be advantages in continuous renewals in giving a uniform lift to the track and in reducing labor costs of renewals, but these are outweighed by the fact that single renewals keep the track as a whole in more uniform and safe condition and obtain the maximum life out of each tie.

As a result of its investigation of ties of other materials than wood, the committee presents a large amount of additional information in the form of brief reports from various roads using special forms of ties. From a study of this data the committee observes that the concrete tie, the combination concrete and metal tie and the combination asphalt and metal tie have not yet proved a success because of fracture caused by vibration, excessive weight and deterioration of asphalt filling. A combination tie of steel and wood is stated to give promise of developing an economic substitute, while the all-steel tie is believed to have proved satisfactory under heavy, medium-speed traffic. It is believed that the fastenings for these ties will be further improved.

The discussion of this report brought up the question of computation of actual stresses in ties under given wheel loads. The opinion was expressed and sustained that enough information is now becoming available to permit approximate assumptions and exact methods of design somewhat similar to those for bridges and abutments. The President explained that progress had already been made along this line in Europe and that it is proposed that the committee shall take up the subject.

Referring to the recommendation favoring single-tie renewals, Hunter McDonald gave some figures on an experimental mile of track laid in 1908, where he has applied the practice of renewals in continuous stretches, with the result that the maintenance account is so far about $200 a mile cheaper than for single-tie renewals. He believes that the continuous system has its merits, but that railway officials have become accustomed to single-tie renewals and are not willing to go to the expense of trying the other plan. C. A. Morse stated that the Santa Fe had 22½ miles of experimental track maintained on that basis and that it was expected the ties could all be renewed when the rail was renewed.

The recommendation of the practice of single-tie renewals in preference to renewals in continuous stretches was adopted.

The association endorsed the conclusions of the committee in reference to its study of the size of ties and its study of metal, composite and concrete ties as presented in the review mentioned above.

Committee on Rail

This committee has prepared a study of rail failures and presents in its report a large amount of tabulated and analytical data on rail failures for the year ended Oct. 31, 1910. It was found that the responses to enquiries were more complete than before and showed that most of the railways are now keeping a record of their rail failures. Eighty-three companies furnished statistics relating to about 11,750,000 tons of rail. The report included summaries by sections, weights and kinds of steel; classification according to position in the ingot and a comparison of the wear of special rail.

As a result of its study of this information the committee makes the observation that accurate and specific information is not furnished for the determination of the value of different sections of rail because of the variations in traffic and roadbed conditions and in the conditions surrounding manufacture. It is believed that the difference in quality of material may eliminate differences in rail sections, but it is pointed out that the matter of desirable features of rail sections should be kept in mind at the same time that the present efforts toward improvement of material are made so that when a good quality of metal is attained there will also be a desirable rail section. It is observed that a study of these statistics furnishes information relative to the difference between Bessemer open-hearth and alloy steels and shows a relation between broken rails and failure of head, web and base. It also shows a difference between rails of different mills when the sections and chemical composition are practically the same.

M. H. Wickhorst, engineer of tests of the committee, has made an investigation to throw light on the relationship of the size of ingots of Bessemer rail steel to the segregation of the metalloids, locations of pipes and blow holes, and the properties of the rails. It was found that under the conditions of the tests, the carbon, phosphorus and sulphur collected or segregated toward the interior and upper part of the ingot and that, in a general way, such segregation increased with the size of the ingot. The

Fig. 6. G.T.R. Grade Separation, Shoring Wall at Exhibition Grounds, Dec. 1, 1911.

Fig. 7. G.T.R. Grade Separation. Looking East at Sunnyside, Dec. 1, 1911.

manganese segregated to a much smaller extent, while the silicon showed little tendency to segregate. The elements which segregated showed a lowering in the top part of the ingot below the average composition of the steel, and this lowering extended downward along the sides. The "negative" segregation increased with the size of the ingot and extended down farther along the sides. There was a region of negative segregation in the interior and lower part of the ingot, but the lowering of the elements was not as great in this region. It appeared that the material was distributed in the rail bar about the same, relatively, as in the ingot from which it was rolled.

Another investigation has been made by Mr. Wickhorst to determine the influence of the temperature of rolling on the properties of Bessemer rails. It indicated that the ductility and deflection in the drop test were little influenced by the rolling temperature. The number of blows to break the rails was uninfluenced by the temperature of rolling. The yield point and tensile strength in the tension tests were little influenced. The elongation in the tension test decreased some as the temperature increased. The influence of temperature showed most prominently in the tension test, in the reduction of area, which decreased as the temperature of rolling increased. The size of the grain shown by the microscope increased with the temperature. It appears that the ductility in the drop test with the head of the rail in tension more nearly indicates the ductility of the interior metal as measured in the tension test than does the ductility in the drop test with the base of the rail in tension, which is usual in inspection work.

An analysis of U.S. Government investigations of rail ingots at the Watertown arsenal, embodied in the report of tests at the arsenal for 1909 has also been made by Mr. Wickhorst.

J. T. Richards, Chief Engineer of Maintenance of Way, Pennsylvania Rd., has prepared a study of the comparative wear of Bessemer, open-hearth and nickel-steel rails on that road, which is appended to the report.

The committee presents a set of rail specifications and reports progress on recommendations for a standard rail section.

In the discussion, E. Howard, of the U.S. Bureau of Standards, stated that he believes the rail tests have not yet covered some important points. Speaking of the influence of ductility and the indications of the drop test, he stated that these show principally that the metal is well worked, which is already established by the fact that it has become a rail. He thinks the drop test does not go quite far enough and that more information is needed on the elastic limit and also upon the fibre stresses in rails. He also pointed out that if a high ductility in a crosswise direction were required in the drop test there would probably be fewer base fractures.

He said that carbon may vary considerably in different parts of a rail and that it should be examined carefully for it. Chemical composition, he believes, should be determined by the physical requirements of fibre stress and rolling resistance, and that a steel harder than a mild steel is necessary, though not so hard as to be brittle. He favors medium carbon in a zone around 0.65 to 0.70. He stated that the rapid alterations of stress may produce a change in the properties, the wheel pressures producing internal strains which might result in failure. To illustrate, he cited the case of a steel cylinder in which very high internal strains were induced by tapping continually with a light hammer, the bore becoming enlarged.

Fig. 9. G.T.R. Grade Separation. Locating a Subway Girder.

A point of discussion receiving considerable attention was brought up by L. C. Fritch, suggesting that a test piece should be taken from each ingot. He believes that in addition to the present prescribed tests, a piece should be taken from the A rail of each ingot, nicked and broken. If it shows no interior defect the rails of the ingot should be accepted. Otherwise the A rails should be rejected and a test piece broken from the B rail, and so on. It was pointed out that some Canadian mills have voluntarily proposed a somewhat similar plan.

A set of specifications for steel rails was adopted, some paragraphs of which however, are not considered as final, in that sufficient information is not yet in hand to make these sections mandatory. These paragraphs include provisions for modification of carbon for low phosphorus, for the fixing of average carbon, for ductility and for permanent set.

Committee on Track

The work of this committee has been directed toward the preparation of general specifications covering material and workmanship for frogs, crossings and switches, including the use of manganese and other special alloys; specifications for track bolts, nuts, locks, tie plates, common track spikes and screw spikes; and the study of designs for main-line turnouts. Specifications for frogs, crossings and switches have been prepared and are included in the report. On the second subject the committee is formulating principles as to the functions, material and form of tie plates and track fastenings, but the work has not progressed far enough to be presented in the report. Work on the design of turnouts has been held in abeyance pending the adoption of standard numbers of frogs and lengths of switches.

Fig. 8. G.T.R. Grade Separation. Keele Street Subway, Dec. 1, 1911.

This matter of frogs and switches has been under consideration several years. In determining the length of switches the committee reports that provision should be made for the following general classes of turnouts: (1) Those to be operated over the divergent route at the maximum practicable limited speed; (2) main-line turnouts and cross-overs to be operated over the divergent route at low speed; (3) yard turnouts, and (4) turnouts requiring frogs of large angle. Bearing upon this is the question of economical cutting of the 33-ft. rail. Objections which were presented to the use of the full 33-ft. rail are that the length, being the same as that of the stock rail, is such that one joint of the latter must necessarily come near the point of the switch and the other joint ahead of and near the heel of the switch, often necessitating the clipping of the angle bars; and also the great length of laterally unsupported rail. On these points the committee is of the opinion that the location of the joints of the stock rail 40 in. ahead of the point and heel of the switch is not seriously objectionable, and that the clipping of the angle bars is not an expensive operation and does not seriously weaken the joint; also that switches 33 ft. and even 45 ft. long have been successfully used to such an extent that there seems to be little ground for apprehension on account of the length of laterally unsupported rail.

It is stated that the longest switch points should be used in those turnouts where the highest speed is desired, and that since these switch points necessarily get severe usage they should be made of the very best rail. These considerations lead the committee to the

opinion that the length of switch points for the four classes of turnout above mentioned should be respectively 33 ft., 22 ft., 16½ ft. and 11 ft.

A theoretical investigation of the rate of turning of a locomotive at the switch point and of the angle between the stock rail and a line passing through the truck centres of a car leaving the switch, indicates that an approximate balance between the deflection through the switch point and the deflection through the lead is attained when the switch angle equals one-fourth the frog angle. This proportion has been found to work out economically in practice. With a 6¼-in. heel distance and ¼-in. thickness of point, this relation between switch angle and frog angle would make the length of the switch in feet equal to twice the frog number.

The committee considers that the highest number of frog which is economically consistent with the longest switch point is desirable for turnouts of the first class and that frogs over no. 14 should have a 33-ft. point; 22-ft. points should be provided for frogs over no. 10 up to and including no. 14; 16½-ft. switch points for frogs over no. 6 up to and including no. 10; and 11-ft points for no. 6 and under, where they are required. Frogs nos. 8, 11 and 16 are believed to meet all general requirements for yards, main-track switches and junctions. It is believed that new work should be laid out as far as practicable for these three frogs, so as to effect the gradual elimination of frogs of other numbers, lessen the cost of manufacture and decrease the amount of stock carried.

Discussion of this report centred on the lengths of switch points and the numbers of frogs which were recommended. In further explanation of the committee's selection of frogs nos. 8, 11 and 16 to serve all ordinary purposes, the chairman stated that though the no. 11 and no. 16 were not yet in very general use, they meet the present tendencies for sharper frogs for high speeds and modern equipment, give the most economical use of rails, and serve practically the purpose of a number of other frogs now in use, reducing the stocks required. The lengths of switch rail selected were explained to make economical use of the rail, to make possible the exact determination of the quality of the rail, in that they are made from the standard 33-ft. rail which is marked as to its position in the ingot. It was argued that they meet the present tendency for longer switch points. It was stated that in France and Germany switch points longer than 33 ft. are in use.

The Association adopted a set of general specifications for frogs, crossings and switches, together with plans for nos. 8, 11 and 16 rigid frogs, no 11 spring frog and 11-ft., 16½-ft., 22-ft. and 33-ft. switches.

The recommendation was adopted that 16½-ft. switch points be used for frogs over no. 6, up to and including no. 10; 22-ft. points for those over no. 10, up to and including no. 14; 33-ft. points for those over no. 14 and 11-ft. points for no. 6 and under where they are required. Frogs nos. 8, 11 and 16 are recommended as meeting all general requirements for yards, main-track switches and junctions, and it is recommended that these three frogs be used in new work as far as practicable to effect the elimination of frogs of other numbers and thereby lessen manufacturing costs and decrease stocks carried.

Committee on Wooden Bridges and Trestles

This committee has been investigating the following subjects: formulas for use in determining the strength of sheet piling; equipment required for pile driving; special methods of driving sheet piles in cofferdams where conditions do not permit the use of ordinary equipment; experience on the bearing power of piles and on the practical results of the use of formulas; the use of guard rails for wooden bridges and trestles, fire protection of wooden trestles.

An experimental method has been devised for determining the distribution of pressure on sheet piling as an aid in the work of the committee, and it was hoped that experiments would be carried out during the past year, but so far it has been impracticable to make arrangements for such. The procedure suggested for these experiments was the construction of a strong open-top concrete box containing a vertical diaphragm of tempered spring steel across its middle, secured at the top and bottom against horizontal motion. Sand or other material to be tested is to be filled in this box and then excavated from one side of the diaphragm, templates being made to record the curve of the diaphragm due to the pressure of the sand. To determine the amount and distribution of the pressure, the diaphragm would then be removed from the box and placed horizontally, supported at its end at the same points as formerly, and loaded with metal strips in such way as to obtain the same curve as that recorded by the templates. The total pressure and centre of pressure could thus be determined experimentally and could be checked mathematically from the recorded curve of flexure. It is believed that this apparatus could also be used for testing such materials as semi-fluid mud and ballast, and that it could be used to determine the pressure on abutments.

No data is given in the current report on the second and third subjects under consideration In regard to pile-driving experience giving information on the practical use of formulas, the committee found that only a few roads kept records of their pile driving in form for use in its investigations. The committee is of the opinion that a pile-driving formula should be based on theoretical considerations, but that there are so many modifying conditions that the final formula must be more or less empirical. These modifying conditions may be obtained from actual experience and records, records of the behavior of piles during driving and after loading. Records of test piles loaded to failure are considered especially valuable.

A large amount of data has been collected in reference to guard rails, but is not considered to be in form to present recommendations.

In reference to the fire protection of timber bridges and trestles, the committee found that 62% of the 110,000 miles reporting adopted either full-ballast decks, floors protected by a thin covering of ballast or other light material or by sheet metal in such cases where fire protection was considered necessary.

Committee on Masonry

This committee has made a study of the waterproofing of masonry; methods of patching and repairing plain and reinforced concrete; methods of depositing concrete under water; and the unification of Portland cement specifications. Replies to a circular letter, which are abstracted in the report, show that waterproofing is being done throughout the country, but that the methods used are very much the same as previously reported. Some of the replies indicate that impervious concrete can be made without special waterproofing by using a suitable gradation of aggregates and cement and reinforcing the concrete to counteract temperature and shrinkage stresses and by using care in depositing to obtain a dense concrete.

It is observed that in using such materials as felt with coal tar, pitch or asphaltum, fair results are obtained when the weather conditions are favorable and when the work can be done without interference, working continuously until completed; but when such work is done at an unfavorable season, or at separate periods, or in separate sections, under difficulties, or where undue haste is necessary, the results have generally been unsatisfactory.

Relative to methods of patching and repairing concrete, the committee has found that most of its replies contain useful information. These replies are abstracted in the report and certain methods are described, together with comments on their service.

In its investigation of depositing concrete under water the committee finds that nine methods are being employed effectively.

In regard to the unification of Portland cement specifications, the committee has been represented during the year at several meetings of committees representing the U S. Government departments, the army, the American Society of Civil Engineers, American Society for Testing Materials and Association of Portland Cement Manufacturers. At these meetings agreement was reached upon all points excepting the use of the Vicat needle vs. the Gilmore needle in determining the time of set and the Vicat needle vs. the ball tests in determining normal consistency. The result has been that the Government's representatives have recommended the latter test in each case for the standard Government specification, which agrees with the present standard of the association, but uniformity among all those represented has not yet been attained on these points.

Discussion of the recommendations as to methods of patching concrete brought up the question of the use of patented compounds. The committee explained that such materials had not been definitely considered for strictly patching purposes, since their cost is stated to be much more than that of cement, and cement seems to answer satisfactorily. The opinion was expressed that information should be obtained on such special preparations if it is found that they meet conditions where plain concrete does not appear to answer, but it was pointed out that some such information is already included in the committee report.

The conclusions of the committee as to good practice in patching concrete surfaces were endorsed. The conclusions as to good practice in placing concrete under water were also endorsed.

Committee on Signals and Interlocking

This committee has prepared a new insulation-resistance table to be added to its revised specifications for various kinds of insulated wire and has prepared a report on uniform signaling, conferring with the American Railway Association. This latter report contains majority and minority recommendations. The majority presents a signaling scheme in which there are included, in addition to the fundamental positions of "stop," "proceed with caution" and "proceed," a number of supplementary indications covering cases where it is desired to give advance information as to the condition of the block ahead. The minority report provides for positions of the signal covering only the three fundamentals and the supplemental signals of "proceed at low speed" and "proceed at medium speed," the view being held that advance information should not be given and that each signal should have no relation to those in advance or in the rear, but should be observed as the train comes to it.

Committee on Records and Accounts

This committee has continued its study of forms, but has spent the greater part of its time this year in a study of economical ways of managing a storehouse so as to assure a minimum stock of materials at all times. This latter investigation has been based on the effects of storehouse management on the broader

economies of maintenance and operation.

From a study of the report of the Interstate Commerce Commission for 1909 it is found that the wages of labor of the classes whose efficiency depends to a great extent on having proper materials and tools represents about 29% of the total operating expenses, and that the interest on the total value of materials and supplies on hand. at 5%, amounts to about 2.2% of the wages of those employes. Assuming it possible to reduce the stock 50%, it is pointed out that the annual saving would be only 1.1% of the amount paid in wages, so it is believed that even a slight loss in the efficiency of the labor, through failure to secure materials and tools as required, will soon absorb much more than the amount saved by reduced investments in stock. It is therefore believed that the most important function of a storehouse is the prompt delivery of materials and tools so that delays to labor may be reduced to a minimum.

In order to facilitate prompt delivery the committee states certain general principles governing storehouse management, which include standardization of materials and instructions for their use in order to reduce to a minimum the number of items of material of the various classes carried in stock; classification for economical handling; proper stock account for prompt replenishment; notification of shipment in distribution; and efficient organization of the storekeeper's department.

Committee on Rules and Organization

This committee has continued its compilation of rules for the government of maintenance of way employes, which has been carried on for several years past, and has also given attention to the formulation of rules in the nature of specifications or instructions regarding the conduct of work. In the latter connection the committee presents instructions in regard to the maintenance of the proper cross-section of roadbed, the provision of drainage, ballasting, handling of ties, handling of rail and surfacing.

The discussion brought out a statement by E. R. Lewis, of the Michigan Central Rd., of experience with ties laid heart-side down and heart-side up, in which he differed from the committee, which stated that the former method is preferable He finds that the heart-side up gives better spike-holding power and produces less trouble from warping and checking, due to its denser wood. Further discussion led to the alteration of the committee recommendation to allow ties to be laid either way to obtain the best bearing.

Instructions for the conduct of track work were adopted as presented in the report with several minor changes. These instructions cover the maintenance of the subgrade, ballasting, placing ties, laying rail and surfacing.

Committee on Water Service

Investigation is in progress by this committee on the subjects of the design and relative economy of track pans; deep-well pumps; reinforced concrete for water tanks and supports; and water treatment.

Progress is reported on the study of track pans, and it is stated that extensive tests are in progress on the Pennsylvania Rd. at Atglen, Pa.

In its report on concrete for water tanks the committee makes reference to a number of cases of this type of construction and presents a discussion of the advantages of concrete for this purpose and the disadvantages which must be overcome in adapting it. General specifications are presented in the report for reinforced-concrete stand-pipe water tanks for railways, and sketches are given for a tank of this type and also for a concrete tank on a reinforced-concrete substructure.

Progress is reported on the investigation of water treatment and the report presents a paper giving an account of an experience with locomotive boiler corrosion, which followed a partial installation of water softeners, where small pumps were added to discharge soda ash in solution into the tanks.

In the discussion a set of specifications for steel water and oil tanks was adopted as representing good practice. They are intended for tanks requiring plates not more than $\frac{5}{8}$-in. thick and of open-hearth steel. Some changes were made in the specifications as printed in the report, the principal one being to eliminate for the present the parts referring to special steels.

Committee on Yards and Terminals

This committee has been investigating situation plans of passenger stations; development in mechanical freight handling; the design and operation of hump-yards; situation plans for engine terminals; and methods of handling baggage, express and mail at passenger terminals.

Reference is made to a number of installations for mechanical freight handling which are being studied, but it is pointed out that sufficient time has not yet elapsed since their installation to enable all points as to their utility to be determined, and consequently full report on the systems is held over for future presentation. A list of published accounts of freight-handling installations is included in the report.

The committee has prepared a typical situation plan for a division engine terminal and presents this with a discussion of the considerations influencing the planning of such a layout.

The committee reports progress on its other investigations, but is holding the data collected for future presentation.

In the discussion the following principles were adopted as governing the oil of lower grades; these are the same design of a division locomotive terminal: The locomotive terminal should be so located as to afford easy access to both main line and yards, with the fewest possible reverse or conflicting movements; and the facilities provided should be arranged to permit of the most direct and rapid handling of a locomotive in its terminal in the order of its needs.

Committee on Iron and Steel Structures

As a part of the work of this committee a further investigation has been made of secondary stresses by means of field tests. A special form of extensometer for measuring such stresses has been developed and manufactured and has been used for several weeks in the field. The instrument has been developed along the lines of the extensometers used in impact tests, but to secure sensitiveness the principal bearings were made with knife edges, and instead of using a pencil for securing a continuous record a ray of light has been utilized to make the record by allowing it to pass through a minute perforation in a disc at the end of a long lever, the path of this ray of light being photographed on a moving slip of sensitized paper. It is stated that the instrument has proved satisfactory in practical operation and that a very good record has been obtained. The sensitized paper was developed in the field so that results were quickly obtained. Several field tests were made, but the results have not yet been put in form for presentation.

Progress is also reported on the subject of instruction and guidance of inspectors in mills, shops and field, and it is expected that the results will be available within a few months.

On the subject of the design of built-up columns the committee reports that it is working with the joint committee of the American Society of Civil Engineers, and that a very comprehensive programme is planned which should add greatly to the present knowledge of the subject. Practical work on this subject has not yet been taken up.

The work of the committee along the line of specifications for the erection of steel bridges has resulted in the preparation of a set of such specifications, which are included in the report.

A set of specifications for the erection of railway bridges was adopted as presented in the committee report with some slight changes.

Committee on Electricity

The committee on electricity has directed its attention to the subject of clearances and transmission lines and crossings. As a result of its year's work on clearances a clearance diagram for third-rail lines is presented, and conferences held with similar committees of the American Railway Association, and the American Electric Railway Engineering Association lead the committee to believe that similar diagrams will be recommended to those associations. The clearance lines have been established from a study of the clearance diagrams of all principal railroads in the U.S. using third rail. Practically all of the mileage thus represented, with the exception of some interurban electric roads and elevated roads in cities, will clear with this diagram.

As the result of its work on transmission lines and crossings, which has been carried on in conjunction with committees of other interested technical associations and representatives of the telephone and telegraph companies, a set of specifications is presented and is included in the report.

Discussion on this report was chiefly in relation to details of the specifications for transmission lines and crossings, the specifications being adopted with certain revisions, bringing them into accord with those of other interested associations, and giving promise, it was explained, of thus attaining a uniform specification for this country.

A definition of third-rail gauge was adopted, stating that it shall be the distance measured parallel to the plane of the top of both running rails between the gauge of the nearest running rail and the inside gauge line of the third rail.

A standard clearance diagram was adopted, showing lines for equipment and permanent way structures adjacent to the third rail and for the third-rail structure.

A set of specifications for overhead crossings of electric light and power lines was adopted along lines which it is believed will make it conform to a uniform standard for this continent.

Conservation of Natural Resources

This committee has made an extensive investigation of tree planting and general reforestation and of coal and fuel oil resources, collecting information concerning the United States and Canada. A large amount of this material has been presented in the report as progress information. A review has been made of the subject of tree planting and to this there is appended a bibliography of articles pertaining to the U.S. timber sources.

Attention is drawn to the enormous consumption and waste and the loss by fire, and it is shown that experience abroad proves that damage by forest fires is preventable. The consumption of timber in the U.S. (not including fire losses) is 230 cu. ft. per capita, as against 37 cu. ft. in Germany and 25 cu. ft. in France.

As the result of its work on coal and fuel oil resources the committee presents a number of abstracts of important papers on the subject, together with statistical information and specifications, much of this material having been taken from reports issued by the Government.

Signs, Fences and Crossings.

The chairman of this committee explained that the investigations of fence

wire to secure a quality resisting corrosion had met with the co-operation of wire manufacturers and that a large amount of data had been collected which should warrant definite conclusions next year. Up to the present time it appears that wire galvanized after weaving has proved most durable. It was also stated that the tendency toward concrete fence posts was becoming very pronounced and should soon furnish valuable information, but that the period of service is as yet too short.

Relative to forms of flangeways at crossings it was stated that a special roller filler is being tried which should prove a distinct advance.

Discussion of railway signs pointed toward the desirability of uniformity throughout the country as both advantageous for the railways and the public. It was stated that the railways and the public utilities commissions of several States have already taken up this matter and that the railways should take some early action.

The report of the committee on signals and interlocking was presented as information and there was no discussion.

Committee on Wood Preservation

This committee recommended that ties should be grouped for treatment: (1) Those of the two general species of hardwoods and pines should be grouped separately; (2) heartwood and sapwood pine ties should be kept separate; (3) green and seasoned ties should be kept separate, and (4) ties of approximately the same period of seasoning should be put together for treatment. These recommendations were adopted.

The revised standard specifications provide that the oil shall be "the best obtainable grade of coal-tar creosote; a pure product obtained from coal-gas tar or coke-oven tar, and free from any tar (including coal-gas tar or coke-oven tar), oil or residue obtained from petroleum or any other source." At 38 degs. C., it must be liquid and of at least 1.03 specific gravity; it must give no distillate below 200 degs. C., not over 5% below 210 degs. not over 25% below 235 degs. and the residue above 355 degs. C. (if over 5% in quantity) must be soft. The oil must not contain over 3% water. Specifications were submitted also for oil of lower grades; these are the same as above, except that the distillate below 210 degs. and 235 degs. may be 8 and 35% for no. 2 oil and 10 and 40% for no. 3 oil, while the specific gravity for the no. 3 is 1.025.

Discussion of this report centred on the proposed revisions to the specifications for creosote oil. Objection was made to the presentation of a specification for a no. 2 and a no. 3 grade on the ground that it might lower the standards of quality of the treatment. The committee explained that this was done simply to meet a commercial condition which cannot well be avoided in that creosote meeting the no. 1 specification cannot be had in a great many cases. The no. 2 and no. 3 specifications, which differ from the no. 1 only in allowing slightly greater percentages of distillation, meet the needs of many cases and may offer some price advantages. It is stated, however, that where these grades are used it is desirable to inject a greater quantity per cubic foot. It was pointed out that there are cases where the use of such grades would be economical, because of the probability of ties wearing out in the track before they were made useless by decay.

S. R. Church, from the manufacturer's point of view, stated that any of these three oils would prove an effective preservative. He also observed that there is a constant effort among the manufacturers to improve quality.

The following principles governing the grouping of timbers for antiseptic treatment were adopted, which are expected to be supplemented by further conclusions made from future work.

Ties of approximately the same period of seasoning should be grouped together for treatment; green ties should never be mixed with seasoned ones.

Pine ties should be separated on the basis of heartwood and sapwood; it would also be advisable in some cases to group hardwoods on the same basis, but it is not generally practical to do so.

Grouping on the basis of species and families, as for example, red oaks, pines, beech, etc., if a further division into heartwood classes is made with pine is usually a satisfactory practice. From this it follows that red oak, beech, longleaf pine, loblolly pine and gum should be treated separately. Birch and hard maples and certain other combinations depending on the locality, can be grouped together to advantage.

The separation in the yard, on the basis the ties are to be grouped for treatment, is an essential and economical practice.

Changes in the adopted specifications for creosote oil, recommended by the committee, were approved as follows: The first clause of the standard specification was revised to state that creosote oil shall be a pure product from coal gas tar or coke oven tar and free from any foreign admixture, including coal gas tar or coke oven tar. A specification was also added for a no. 2 grade of creosote oil, differing from the no. 1 in that it permits greater percentages of distillation; and for a no. 3 grade, showing higher distillations than the no. 2.

Buildings.

The report consisted mainly of information in regard to various roof coverings (supplementing the report of 1911), and several drawings showing different styles of flashing used for roofs and walls, and methods of laying asbestos shingles.

Grading of Lumber.

The committee submitted definitions of defects and rules for the grading of lumber, which represent specifications for maintenance-of-way lumber, as it can be purchased in the market at present. Similar matter was presented at the 1911 meeting, but was not then adopted. The report was adopted without discussion.

Uniform General Contract Forms.

The association approved the recommendation that a two-page general agreement be used as a folder within which the other portions of a contract can be bound, thus permitting a concise contract form or a large contract form, according to the requirements of the case. A two-page form for this purpose was adopted as presented by the committee. A partial set of general conditions for a construction contract was also adopted, but the committee proposes to add other paragraphs in the future to make it complete.

Safety in Steel Rails.—A joint committee of railway officers and steel-rail manufacturers, organized to consider what can be done to make steel rails less liable to breakage and more durable, was held in New York city recently. It was conceded that improvements can and ought to be made by both sides. Every reasonable effort will be made promptly in this direction. A subcommittee of six was appointed, three representatives of the railways and three of the steel manufacturers to consider the whole subject matter and report their conclusion and recommendation at a future meeting of the general committee.

U. S. courts have recently decided cases for damages against the C.P.R. for forest fires in Maine in 1898, due to sparks from locomotives. The amounts awarded aggregate $139,400, being about half what was claimed.

Victoria Rolling Stock and Realty Co. of Ontario, Ltd.

Following are extracts from the report for the year ended Feb. 15, 1912, presented at the annual meeting in Toronto, March 6:—

The company has not issued any new debentures, and outstanding debentures against leases have been reduced by $160,000. The profit on the year's business, after charging up directors fees and expense account, was $30,488.09, out of which a dividend of 6%, or $14,400, has been paid, leaving $16,088.09 carried forward to profit and loss account, which now amounts to $50,500.11.

ASSETS.

Obligations on leases	$1,065,675 00
Debentures held by company and accrued interest	107,324 61
Cash in bank	71,833 83
Call loans	175,000 00
	$1,419,833 44

LIABILITIES.

Capital stock subscribed	$600,000 00	
Capital stock paid up		$ 240,000 00
Debentures outstanding		1,120,000 00
Interest accrued on same		9,333 33
Balance at credit of profit and loss account		50,500 11
		$1,419,833 44

PROFIT AND LOSS ACCOUNT.

Balance at credit of profit and loss account, Feb. 15, 1911	$ 34,412 02	
Rents received and accrued on leases and interest on advances and debentures held by company	82,664 21	
		$117,076 23
Interest paid and accrued on debentures		$ 49,996 83
Expense account		879 29
Directors' fees last year		1,300 00
Dividend account		14,400 00
Balance carried forward		50,500 11
		$117,076 23

MEMORANDUM RE ROLLING STOCK.

Original cost of rolling stock held under existing leases	$2,939,370 00
Amount paid in on account by railway companies in addition to interest	1,819,370 00
Total amount of the company's debentures outstanding	$1,120,000 00

The directors and officers for the current year, who were re-elected, are as follows:—President, Sir Edmund B. Osler; Vice President, W. D. Matthews; Managing Director, R. A. Smith; other directors, D. Coulson, Hon. J. S. Hendrie, F. G. Osler, D. C. Wilkie.

Improved Mikado Type Locomotive.—A forward step in locomotive design was recently made by the American Locomotive Co. in the construction of a Mikado (2-8-2) type locomotive for the Chesapeake and Ohio Ry. A very complete interchangeability of parts has been obtained between this locomotive, designed for heavy moderate speed freight service, and a Mountain (482) type locomotive built for severe passenger service in hilly country on the same road. Practically all the important parts are capable of an interchange, these including such members as cylinders, crossheads, pilot, pistons, bearings, springs, throttle, side rods, crank pins, trailing truck, and numerous other parts of equal importance. In all, there are nearly 60 main parts that are the same on both locomotives. This duplication of parts is said to have been made without any sacrifice in the efficiency of the newer locomotive. The principal change in the design, due to the shorter wheelbase, occurred in the boiler, which was shortened the desired amount through reducing the lengths of combustion chamber and smokebox, the tubes remaining as before.

Mackenzie, Mann and Co., Ltd., have ordered recently 75,000 tons of steel rails from the Dominion Iron and Steel Co., and 50,000 tons from the Algoma Steel Co., for use on the various Canadian Northern Ry. lines.

Simple Mallet Locomotive Built by the Canadian Pacific Railway.

In the March issue of The Railway and Marine World, a detailed description of a series of Mallet locomotives built by the C.P.R. for use in the mountain service on the British Columbia Division was given. It was mentioned that the fifth of the series was to differ from the other four in that it was to be simple with 20 x 26-in. cylinders on both frames, instead of 23 x 26-in. on the rear, and 34 x 26-in. on the front frames, as in the compounds. This simple Mallet is numbered 1955, the others running from 1951 to 1954.

The general design of this locomotive has been carried out on the same general lines as the compounds, except that the boiler was increased slightly to give a greater heating surface, and the valve gear was changed to suit the new single-expansion cylinders. The cylinders, steel castings as in the compounds described in the last issue, and similar in construction, are all made from the same pattern, both pairs having outside admission. This feature results in both the front and rear valve gears being duplicates. The valve travel was increased from 5½ to 6½ ins. in order to obtain a greater cut-off, the maximum being at 88% of the stroke.

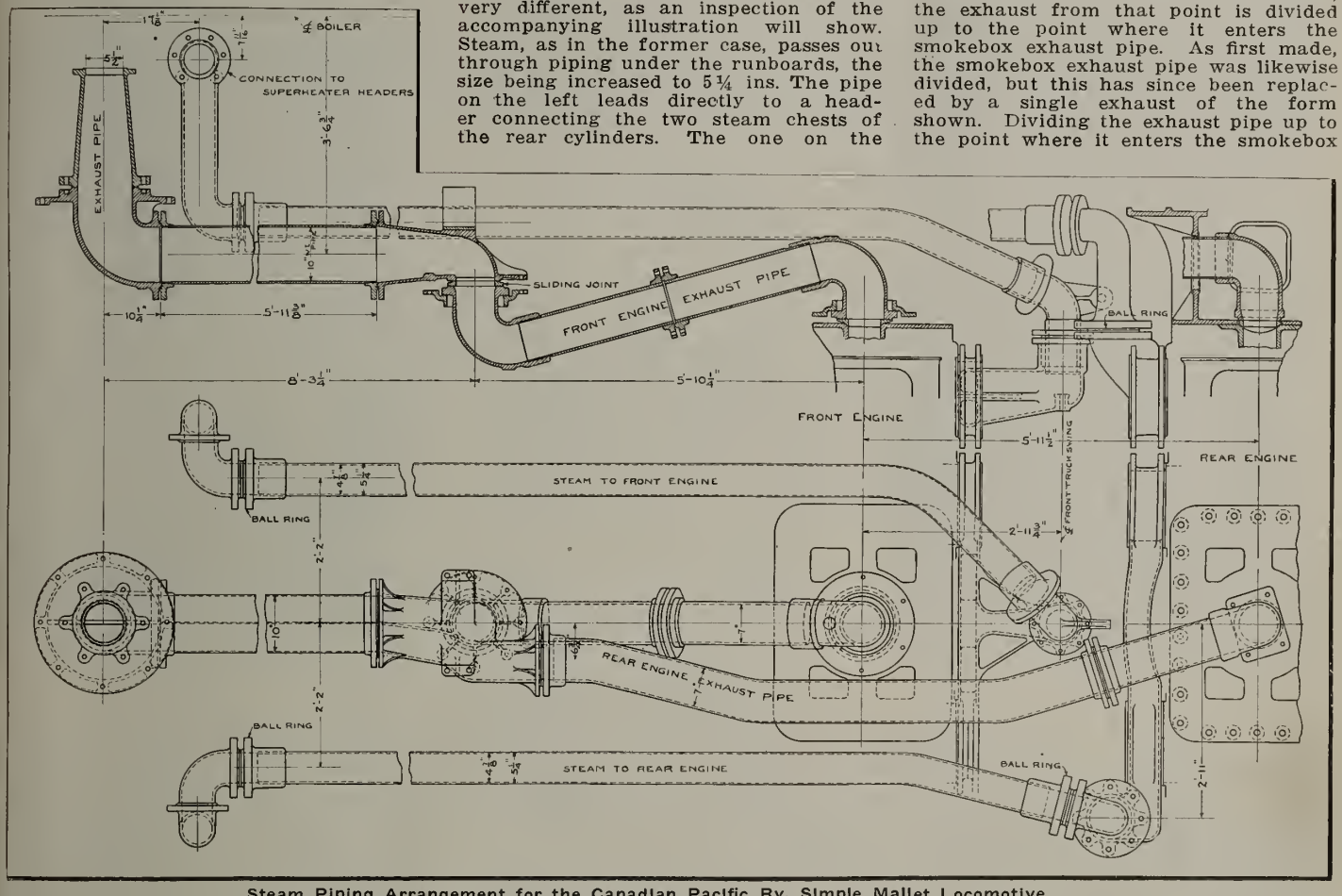
The arrangement of steam piping, one of the most prominent points of difference in these locomotives, is shown completely in the accompanying illustration. In the compounds, the steam passed back from each side of the superheater header through the smokebox sides to 5-in. pipes passing along under the runboard on each side to the high pressure cylinders located one on each side of the forward end of the rear frame. The high-pressure cylinders, being of the inside admission type, meant that the steam in exhausting from these cylinders, passed straight out through the valve body to a small header on the ends of the valve chambers, connecting then through a looped pipe to the low-pressure cross-over header. The connection between the two engines through this looped pipe, is through a swivel joint located directly over the point of junction of the two frames. From the low-pressure cross-over header the steam is passed into the low-pressure chests, which are of the outside admission type. The exhaust from these cylinders passes out from the valve chambers to a common exhaust pipe, 9 ins. diameter, leading to the exhaust pipe in the smokebox. This 9-in. pipe is designed to adjust itself to the different positions of the front truck by having the ends swivelled, one end in addition having a slip joint that allows the pipe to lengthen slightly when the engine is taking a curve.

The piping in this simple engine is very different, as an inspection of the accompanying illustration will show. Steam, as in the former case, passes out through piping under the runboards, the size being increased to 5¼ ins. The pipe on the left leads directly to a header connecting the two steam chests of the rear cylinders. The one on the right leads back to the swivel connection located directly over the point of juncture of the two frames, passing down into a cross-over header connecting the front cylinder steam chests. The four cylinders being of the outside admission type with the exhaust passage coming up through the top of the valve chest, make a good arrangement of exhaust piping, as the illustration points out. The exhaust from the rear engine passes through a 7-in. pipe leading over the front cylinders and under the boiler to a Y-connection. The front engine exhaust passes out from its cylinders in a similar manner to a pipe leading to the lower face of the Y-connection. The exhausts from both engines pass on into a 10-in. pipe divided down its centre by a ¼-in. plate, leading into the smokebox, exhausting at that point through a 5½-in nozzle.

The exhaust from the front engine is the only one requiring flexible connections, and as the relative movement of the connection on the boiler and that on the front cylinders is very slight, expansion joints capable of meeting a wide range of extension are not a necessity. Instead, sufficient extension can be obtained by having the faces of the elbows slide on the faces of the ball rings. The method of thus allowing the faces to slide within limits is obtained by a simple change in design. A large retaining ring, bored out 1½ in. larger in diameter than the flange of the elbow, is held in position by studs carrying small coiled springs, of 200 lbs. capacity each, between the flange and the nuts of these studs. This allows the joint to slip within the limitations set by the bore of the retaining collar, and at the same time maintain a steam-tight joint.

The front sliding joint connection is attached directly to the lower face of the Y-connection casting, the rear engine exhaust passing through a flanged connection face. As before mentioned, the exhaust from that point is divided up to the point where it enters the smokebox exhaust pipe. As first made, the smokebox exhaust pipe was likewise divided, but this has since been replaced by a single exhaust of the form shown. Dividing the exhaust pipe up to the point where it enters the smokebox exhaust pipe, has the advantage of making the draft more continuous, and what is more important, keeps it from losing strength. Were the exhaust of both cylinders to pass into the large volume of the 10-in. pipe, provided the latter were not divided, this pipe, from its volume, would act as a receiver, reducing the intensity of the draft.

The only other simple Mallet in America that is known to the writer, is one recently built by the American Locomotive Co., for the Pennsylvania Rd. This was claimed by the builders to be the only one then existing, and as far as known, none has since been constructed, other than the C.P.R. locomotive under discussion. The Pennsylvania locomotive is so different in construction from this simple Mallet as to make a fair comparison impossible. The C.P.R. locomotive was the first to be put into regular service, the other having been subjected to considerable experimenting before it was finally put into service.



Steam Piping Arrangement for the Canadian Pacific Ry. Simple Mallet Locomotive.

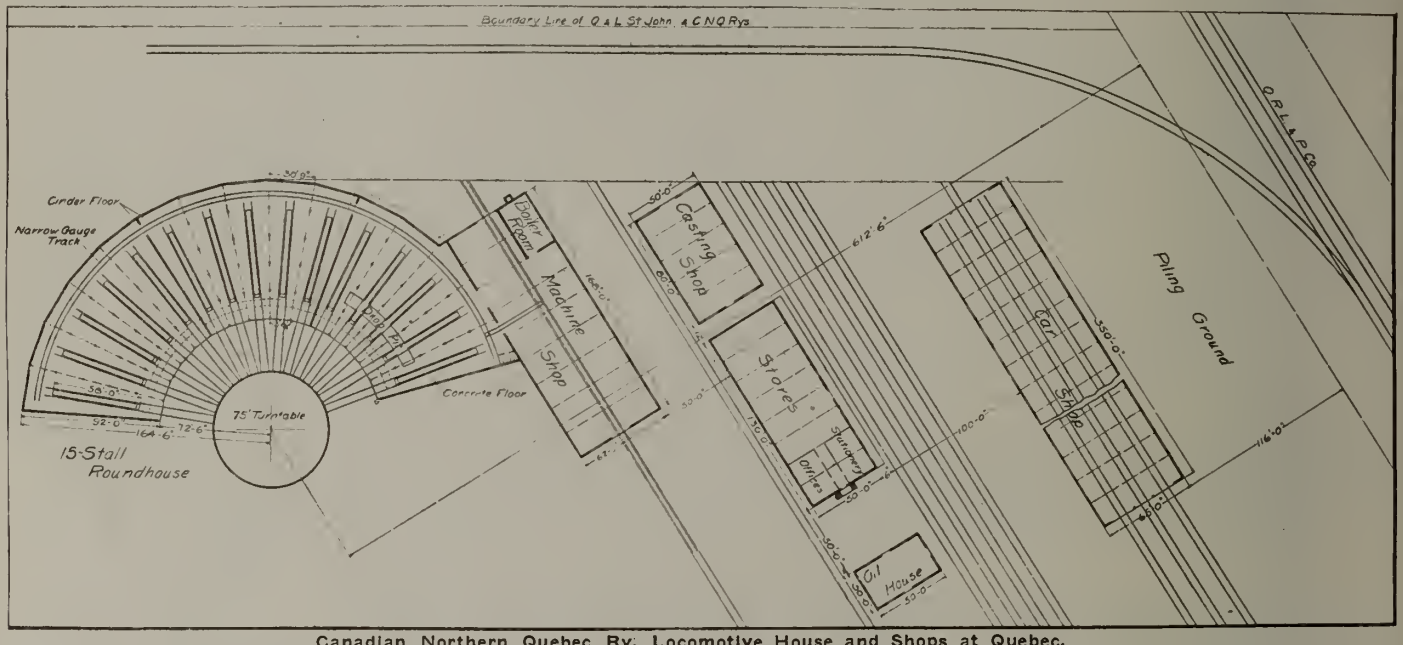
The C.P.R. locomotive was in regular service last October, while the Pennsylvania one, as far as can be ascertained, was not working before the end of November.

The writer is indebted to the C P.R. Motive Power Department for the information contained in the foregoing.

Canadian Northern Quebec Railway Locomotive House and Shops at Quebec.

The Canadian Northern Quebec Ry. is building a roundhouse and shops at Quebec for joint use with the Quebec and Lake St. John Ry. The location is on the outskirts of the city, just across the St. Charles River, at a point where the two railway lines come together in the old village of Limoilou, which was absorbed by the city a couple of years ago.

The site, which is practically level, occupies some 20 acres laid out in the manner indicated in the accompanying ground plan. Electricity for both power and lighting purposes is distributed to all the buildings from outside sources.



Canadian Northern Quebec Ry. Locomotive House and Shops at Quebec.

The grounds are piped with city water, which with steam and compressed air piping, is carried in a tunnel connecting all the buildings with a central power station in which will be located all the heating apparatus, compressors and water pumps.

All the buildings are single story, constructed throughout in a fireproof manner of reinforced concrete. Entrance to all the buildings from the tracks is from the lower end.

ROUNDHOUSE.—A 15 stall roundhouse is located at the left end of the grounds. It is divided into three 5 stall sections by two fire walls, with communication between the sections through doors at the rear. A 75 ft. turntable provides access to all the stalls. The two sections to the left have cinder floors, while the third is laid with concrete for washout purposes. This latter section also has a connecting drop pit under three of its stalls, each equipped with hydraulic jacks for lowering driving wheels, etc. Around the rear wall of the roundhouse, there is a narrow gauge track for the carrying of parts, leading into the machine shop by means of a couple of small turntables.

MACHINE SHOP.—Along the right edge of the roundhouse is the machine shop for locomotive repairs. It is a reinforced concrete building 62 x 168 ft., provided with both standard and narrow gauge tracks down the centre, the latter connecting with the narrow gauge system in the roundhouse. One corner of the shop is partitioned off for the boiler room, and contains the heating apparatus and the necessary auxiliary equipment. All the machine tool equipment is to be contained in the machine shop, with none in the drop pit part of the roundhouse, this being the reason for these two buildings being located adjacent to each other. The machinery from the old shops is to be installed, together with a considerable quantity of new machinery to cope with the increasing rolling stock.

THE CASTING SHOP or foundry is housed in a concrete building, 50 x 80 ft., located parallel to the machine shop with an intervening space of 50 ft. It is to be equipped with the latest in foundry appliances.

THE STORES are located in a 50 x 130 ft. concrete building in line with the casting shop. It is to be fitted with shelves and racks for easy access to the supplies. The storekeeper's and officials' offices are located at the front of the building on one side of the central entrance. A similar division on the other side of the entrance forms a stationery store room.

THE OIL HOUSE, 30 x 50 ft., is in line with the stores building, but 50 ft. in front, designed in the most approved manner. Self-measuring oil pumps located along the side walls, connect with the oil supply tanks in the basement, where they are away from disturbing influences. The whole structure is of reinforced concrete.

THE CAR SHOP, located 100 ft. to the right of the last row of structures, is a reinforced concrete building, 65 x 350 ft., extending some distance below the position indicated as its end in the plan. There are three repair tracks extending the length of the building. One end of the shop is to be set aside for the necessary wood-working machinery.

PILING GROUND.—Alongside the car shop there is a strip of land 116 ft. wide for timber, car repair parts, and sundry outdoor stores.

The shops as at present planned are not very extensive, as the intention is to only handle such rolling stock there as terminates at that point. This will include the Quebec and Lake St. John Ry. and the eastern end of the Canadian Northern Quebec Ry. For the purposes required at present and in the near future the shops will be of sufficient capacity to meet all demands.

Self Clearing Ash Pans for Locomotives.

Mention was made in The Railway and Marine World for March that the Board of Railway Commissioners had passed an order requiring that all railways under its jurisdiction must by Dec. 31, 1913, equip their locomotives with ash pans that may be dumped without the necessity of any employe going under the locomotive to do so. In order to ascertain the extent to which dumping ash pans are used in Canada, we communicated with the larger railways and have elicited the following information:—

TThe Canadian Pacific Ry. has about 25% of its locomotives equipped with a standard type of self-clearing ash pan.

The Grand Trunk Ry. has a number of locomotives of all sizes equipped with ash pan cleaning devices.

The Canadian Northern Ry. has practically none of its locomotives equipped, but has the matter under consideration

The Temiskaming and Northern Ontario Ry. has only four of its 40 locomotives equipped, and no decision has been arrived at as to what type will be adopted.

The Wabash Rd. has practically all the locomotives on its Canadian lines equipped, two types being in use. For shallow ashpans, the swipe system is used, by which the ashes are blown out by steam pressure, while a self dumping ashpan is applied on the deeper types of pans.

Largest Railway Terminal in Germany —The central station at Frankfort which has heretofore held the record for size among the railways terminals in Germany, must now give place to the station at Leipsig, which has been building for the last nine years and has just been completed at a cost of $34,000,000, an outlay represented not so much by ornament and decoration as by enormous size for the accommodation of freight as well as passenger traffic.

During Feb., 12 employes were killed and 31 injured in the course of their work connected with the operation of Canadian railways. Of the fatalities, five were due to persons being run over, three to being crushed between cars, two to derailments, and one each to being struck by a train and to falling material.

Railway Mechanical Methods and Devices.

Saw Guard at the Michigan Central Railroad Car Shops.

Prevention of industrial accidents occupies a very important position in the minds of those responsible for the physical welfare of their workmen. Railway shops have kept well in the van in this movement for better safety devices on dangerous machinery, such as saws and machines of a similar nature. In this connection, the Michigan Central Rd. St. Thomas, Ont. shops afford a good example in some particulars of what is being done in that connection, for the writer on going through them was impressed with the manner in which

Simple and Easily Adjusted Saw Guard.

some of the dangerous wood-working machinery had been protected.

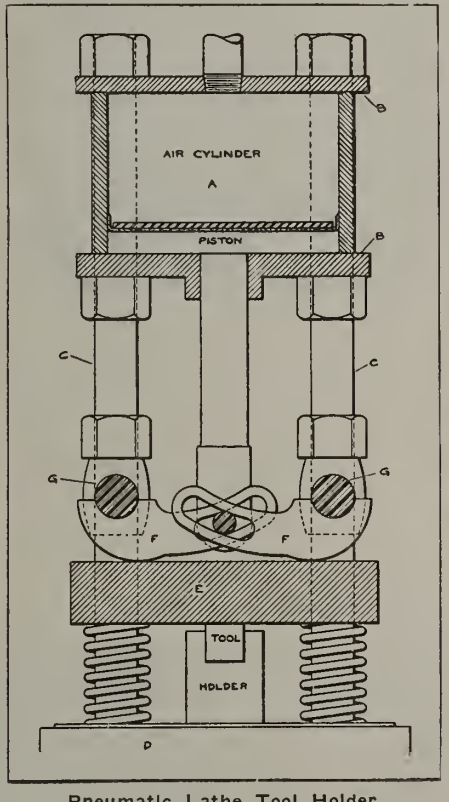
The saw guard illustrated herewith is a fair sample of what is being done in these shops. A simple sheet metal hood, giving ample clearance space for the saw, is held securely in position by two pipe supports from the roof girders, and is laterally braced by wall struts, made of pipe and secured in the manner indicated. This holds the saw rigidly, the vibration of the saw not affecting it in any way. The vertical strip holding the guard, slides through guides in the vertical pipe supports, and may be secured in a number of positions by the insertion of pins in the holes provided This permits of the hood being kept down as low on the work as practical clearance limits will permit, leaving no dangerous space through which the workman's fingers might slip. At the same time the guard may be lifted completely out of the way, when not required, for a special job. The construction is especially simple, and should appeal to all car shop foremen.

A Dynamometer Car of unusually high capacity has been put in service on the Atchison, Topeka and Santa Fe Ry. It is designed to take and safely record a shock of 1,000,000 lbs. at the drawbar, and is mounted on a steel frame of a very solid construction as necessitated by the nature of the work to be performed. The recording apparatus is operated by electric power.

Pneumatic Tool Holder used by Pere Marquette Railroad.

The accompanying illustration shows a novel device for holding lathe tools on such jobs as require a frequent changing of the tool relatively to the work. Such a condition exists in car and driving-wheel lathes, where it is necessary to shift the tool quite often to give the correct tire contour. The tool here shown was designed by F. C. Pickard, Machine Shop Foreman at the P.M.R., Grand Rapids shops, and is being adapted by other shops of the system.

The device consists of an air cylinder A, held between plates B, which form the cylinder heads; other arrangements of the cylinder are possible. These two heads are held together and supported by four bolts C on the tool carriage of the lathe D, the bolts being at the four corners. On this carriage the tool holder rests. The top of the tool holder is



Pneumatic Lathe Tool Holder.

cut out just to fit the 1¼-in. steel used for the tool. This part of the design is one of the most important features, for, by the use of a tool properly supported on all sides, as in this case, the section of the tool may be materially decreased, resulting in a considerable saving in expensive high-speed steel.

Over the tool, there is a clamp plate E, supported by coiled springs over the corner bolts, normally keeping the clamp-plate clear of the tool. Pressing down on this clamp-plate when it is in use, are two cams F, pivotted on cross-arms G between the bolts C at the sides, and operated by a plunger in the air cylinder A. A tight, positive grip is thereby obtained on the tool, controlled by the air valve above the cylinder, and which, of course, may be arranged where desired by piping.

The C.P.R. has, according to press reports, arranged with the Trans Siberian Ry. for round the world tickets, to go into effect May 1.

Stand for Coupler Knuckles at the Central Vermont Railway Shops

A convenient method of piling coupler knuckles is shown in the accompanying illustration of the practice in the Central Vermont Ry. stores department at St. Albans, Vt. The stand, comprising a series of racks, is of a very simple construction. The individual units of the stand are made up of rough boards placed face to face a sufficient distance apart to allow the entry between them of the hinge portion of the knuckle. The edges of the boards are inclined slightly from the perpendicular, giving the face of the

Stand for Piling Coupler Knuckles.

stand a little slope. Eight boards ranged in this manner form rack recesses for seven piles of knuckles. This is duplicated on the other side of the stand, making 14 rack piles in all

No special care is required to pile the knuckles in position, the lowest one being merely placed on the floor, and the others in a pile above, the sloping face of the stand preventing them from falling out. In a rack of the capacity shown, each unit holds about 16, making a total rack capacity of 224 knuckles. The principal advantage of such a scheme of storing lies not so much in the saving in floor space, which is very slight, but rather in the convenience and accessibility, the knuckles being easy to get at, and making a neat arrangement both from the standpoint of appearance and storekeeping.

This arrangement is not exactly a new one, but there are so few places where it is in use that a spreading abroad of its advantages would seem desirable.

Eastern and Western Railway Mileage.—Senator Lougheed announced in the Senate recently that on Jan. 1 there were 14,800 miles of railway in Canada east of Lake Superior. On the same date being in operation, and 11,280 miles west of Lake Superior. On the same date 2,200 miles were officially regarded as being under construction east of Lake Superior, and 4,800 miles west of it.

Making Superheater Tubes at the Montreal Locomotive Works.

An interesting operation is that of making tubes for superheaters such as the Vaughan-Horsey type, the steps in the process of manufacture of which are outlined in this article, the Montreal Locomotive Works practice being the one considered. The initial steps in the production of these tubes occur in the blacksmith shop, under the direction of J. G. Boyer, Blacksmith Shop Foreman. As this part of the process is the only one of particular interest, the description will be confined to it.

The tubes in the several stages of completion are shown together in fig. 1. The original tubes appear as at A, plain tubes as they come from the mill. They are first taken to the upsetting machine, where the ends are upset in the usual form of upsetting dies to the form indicated at B. In this operation, the end is heated for a short distance, and gripped in the upsetting machine just back of the red-hot portion, by the cross ram, the dies of which are formed to the outside shape of the completed flanged end, the end plunger with guiding tit to enter the tube bore and prevent it from crushing, upsetting the end to this shape. There is also a back stop for keeping the tube from slipping in the dies while upsetting. A flash which runs back from the upset end may be noticed on the lower end of the tube as at B, the flash forming a cup ring around the edge. The tubes in this state are next taken to a small hollow-spindle engine lathe, the flash being there removed, and the end machined all over to the required end shape, size gauges being employed. This leaves the tube end in the shape indicated at C. The most interesting part of the work commences at this stage of the proceedings. The machined end is heated as before, and a small iron plug of a diameter corresponding to the internal diameter of the tube, driven lightly in the end, this operation on completion leaving the tube end as at D. The reasons for this will become apparent when the next operation is explained.

The great difficulty to be overcome in the bending of tubes is the tendency they have towards collapsing, especially if bent to a very sharp radius. There are several means of overcoming, or at least counteracting, this tendency, the more common of these means being that

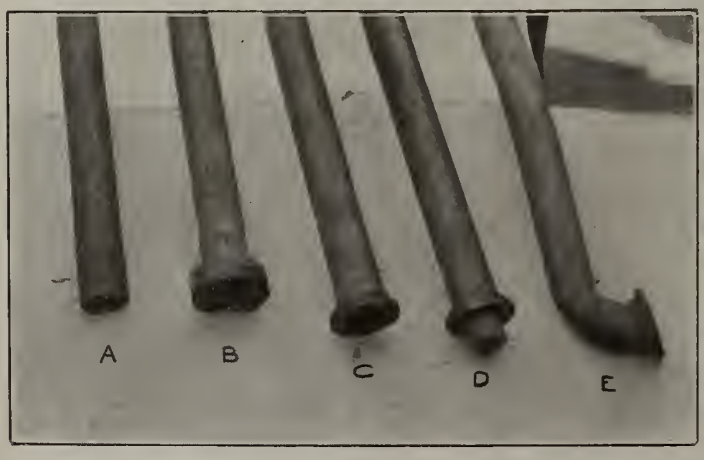


Fig. 1. Tube Ends in Different Stages of Completion.

of filling the interior of the tube in the vicinity of the section to be bent with a foreign substance that can more or less readily be removed after bending. A substance frequently used for bending brass tubing is resin, poured into the tube bore in the molten state, and melted out after bending, the solid resin during the bending being sufficiently solid and withal having the ability to break up to accommodate the bending of the tube, this breaking up presenting sufficient resistance to keep the walls out into their normal circular form. In the case of these superheated tubes, the supporting medium is common sand, held in position by a piece of waste packed in on top of the sand, so that while solid, it has sufficient give to accommodate the tube in bending.

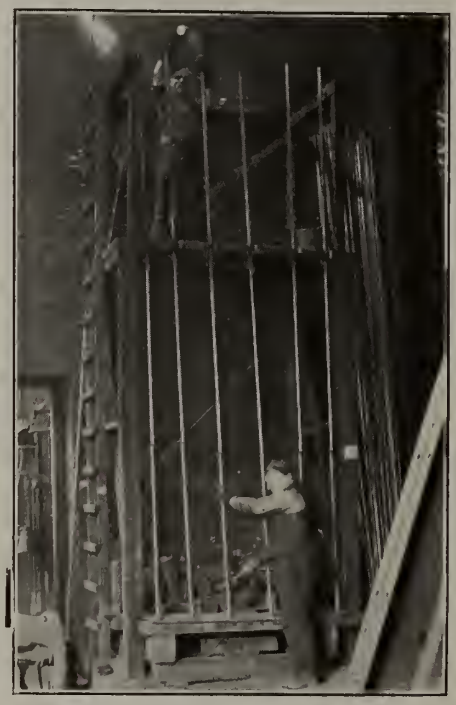


Fig. 2. Filling the Tubes with Sand.

Following the end-plugging operation, the tubes are ready to be filled the desired amount with sand. The method of performing this seemingly awkward operation is shown in fig. 2. A vertical stand, built up against the wall as indicated in this illustration, has recesses for six tubes standing vertically along its front face. Near the top there is a stand, on which one of the two operators stands. About a pint of sand is poured through a funnel down the interior of the tube, filling it for about 10 ins., the other operator meanwhile tapping the lower end with a short rod to settle the sand into a solid mass in the bottom of the tube. After the six tubes have been successively filled with sand and have had it well tapped down, a small piece of cotton waste is pushed down inside the tube, and rammed tightly with a long rod. The lower operator removes each one as it is prepared, replacing with one that has not been sanded, so that the operation is a continuous one, both operators being at all times employed. A whole batch of tubes is prepared in this way at one time.

The next operation is that of bending to the required angle—slightly more than 90 degrees on account of the small reverse curve a little further along the tube. The process of bending is shown by fig. 3. Fig. 4 illustrates the mechanism of the bending machine, which bends the tube ends to the shape shown at E, fig. 1. Referring to fig. 4, the construction of the device is as follows: On a stationary base A, there is mounted block B, recessed as shown at C to form a half shape of the tube end, that is to say, this block contains the lower half of the impression of the completed end of the tube, following a line through the centre of the tube. Another block D sliding on guide surfaces E of the base casting A, and prevented from lifting by flanges under the walls of B, contains the corresponding half impression of the downwardly projecting end of the tube, that is, the part at F. This block D may be moved back and forth by the fulcrumed lever G, connected to the block through the link H. When the link G is thrown into its horizontal position to the left, the half sections of the die at F are in tight contact with each other.

Pinned on this sliding block D, there is an arm I, to which is rivetted a die J, forming the upper half of the tube end former. This contains, on its lower surface the form of the upper section of the tube end, from the downwardly projecting end to the right. Thus the forms for the tube bending are in three blocks, the lower section in block B and the upper section in blocks D and J.

The operation is as follows: With the handle K thrown back into its horizontal position so as to raise die-block J into a vertical position, and with the lever G raised drawing D to its open position, a prepared tube, plugged and filled with sand as at D, fig. 1, and heated to a working heat, is placed vertically in the forming dies against the vertical face of the stationary die-block B. The sliding die block D is then forced over to the left against the tube end by the lever G, this operation clamping the tube securely in a vertical position. One of the operators then grasps the upper part of the clamped tube, pulling it over into the die form of block B. Lever K is then raised until block J rests on the partially bent tube end, when by a combined action of the lever K, and a hammering on the outer end of the block J, the tube end is forced down into the die forms until the faces of blocks B and J meet. Lever K is then lowered, and lever G raised, releasing the formed tube ends from the dies.

Fig. 3. Operation of Bending the Tube Ends.

The bending action releases the plug from the tube end, so that when the tube

is removed, the plug remains, a considerable portion of the sand in the tube falling out with it. An air hose connection to the rear in fig. 3 is directed on the dies after the tube and plug have been removed, blowing out all the remaining scale and sand. The red-hot tube has by this time burnt the plugging waste sufficiently to cause it to fall out with the sand remaining in the tube, when the latter is tapped lightly. When cooled, the only operation required to put the tube in a finished state as regards that end, is to grind off the contact face of the flange.

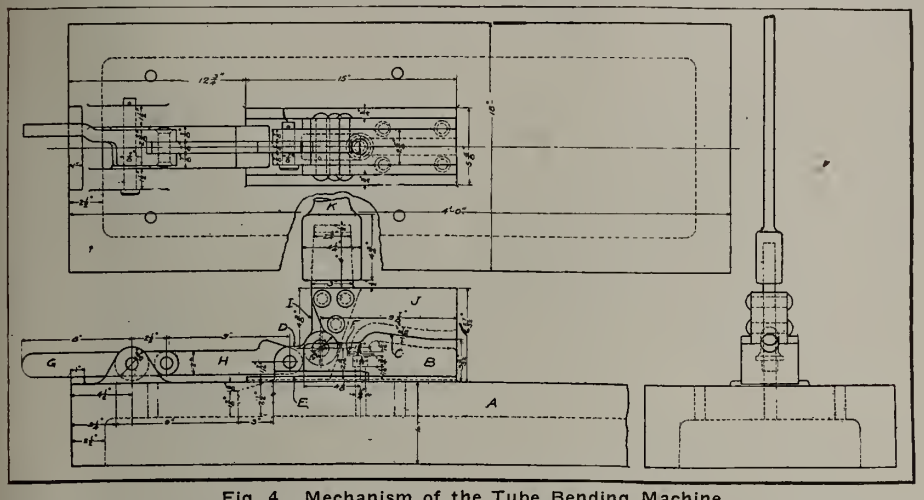


Fig. 4. Mechanism of the Tube Bending Machine.

Oil Heater at the Intercolonial Railway Shops.

A very efficient oil-burning torch has recently been designed and made at the Intercolonial Ry.'s Moncton, N.B. shops for boiler shop use for such purposes as heating firebox patches, heating mudring corners preparatory to moulding into shape, and other places of a like nature.

The construction of the heater is shown in the accompanying illustration. Oil and air are led into a header, the oil through a ⅜-in. w.i. pipe, and the air through a ½-in. w i. pipe, these pipes being in turn connected to the respective supply pipes on the shop wall by rubber hose. A 1-16-in. hole through the centre of the header leads into the air chamber, the oil passing out from its chamber through a 1-16-in. hole close alongside. A cap or regulating nozzle which screws down over the header, has a conical recess on its inner face, registering over a corresponding projection on the end of the header. This cap or nozzle has a 3-32-in. hole through its centre.

The oil supply passing out into the chamber between the header and regulating nozzle, may be regulated at will by screwing down the nozzle on the projecting tip of the header. The air supply being at all times steady, draws forward with it more or less oil, depending on the nearness together of the contact faces.

The intense flame is concentrated on the desired spot by a hood made of no. 16 iron, secured to the header by a wrought iron carrying brace. This hood 10 ins. long, is 4½ ins. in diameter at its outer end. The air and oil pipes are secured together by a light clamp, so that the whole device forms a solid unit. These two united pipes serve as a handle for the operator in directing the flame on the desired spot, and for that reason are made about 2 ft. long, the hose connections leading off from the outer ends.

Oil Burning Locomotives on Great Northern Railway Lines.

As stated in The Railway and Marine World of April, the Board of Railway Commissioners has exempted the Vancouver, Victoria and Eastern Ry. and Navigation Co. from compliance with the order requiring railway companies to provide zinc covering over caps and intersections on wooden trestles in territory where oil burning locomotives are used.

In this connection D. Hawkins, Superintendent of Motive Power, Great Northern Ry., of which the Vancouver, Victoria and Eastern Ry. is a subsidiary advises us that all the V.V. and E.R. locomotives are burning oil. In fact oil is being used as locomotive fuel over the entire Cascade Division, from Portland Ore.. to Vancouver, B.C., and from Seattle to Leavenworth, Wash.; also on all freight power from Leavenworth to Wilson Creek, Wash. All passenger locomotives running between Leavenworth and Spokane, Wash., are also being equipped for oil. All the burners are applied to the front end.

The Stadia for Preliminary Railway Surveys.

The advantages of the stadia for topographical surveys have been argued time and time again, and the adaptability of the method to preliminary railway surveys is a subject which has been thoroughly discussed. Yet, apparently, in spite of all that has been written and spoken, railway location engineers are reluctant to give the stadia a fair trial.

A correspondent, in Denver, Colo., writes as follows:

It is strange that the stadia is not more used for preliminary railway surveys in difficult countries. None of the large roads use it—I speak from experience in every state between Lake Michigan and the Pacific Ocean. Small corporations which have no engineering departments with fixed old ideas have permitted me to use the stadia enough to satisfy me that 15 to 20 men parties in rough preliminary survey work are radically wrong. With one-fourth that force and the stadia I can do more and better work in the same time.

On the Pacific Coast, which is one of the most difficult sections for surveys, railway stockholders have lost much money, and many engineers have lost their reputations, in using old methods. In one headquarters there have been six different chief engineers in as many years. A dozen parties have been sent into one county in a desperate attempt to get a line. Promoters have bought all the timber land for sale, relying on promises of a railway; yet nothing has been done because a survey that can pass inspection has not been made.

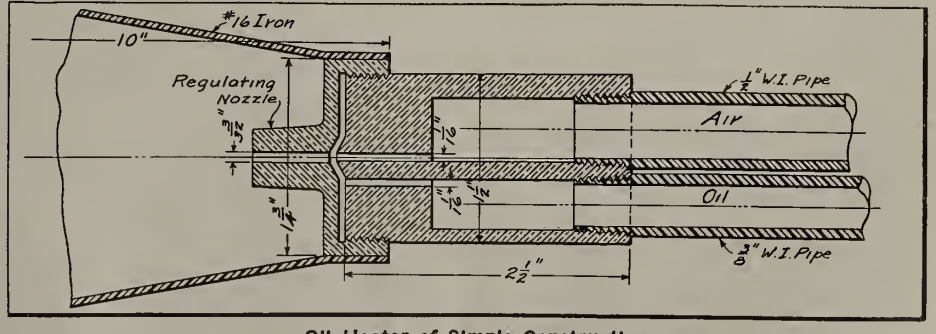
Large parties of cheap men cannot be handled or cared for. There is constant dissatisfaction and change. To keep the cook is by no means the least problem. The cook must have a flunkey, a fine cooking range and what not. I have seen one chief-of-party flunkeying to keep the cook and finally doing the cooking himself. Anything for the salary and title he never had before.

Where a party cannot reach the country where they want to survey, I have seen them survey such country as they could reach. Lines have been run along trails over hill and dale when there was a water grade half a mile away in the wet brush. A report of miles run must be sent to headquarters each week. There is no end of difficulties working in the rough country under these conditions.

A small stadia party can move every day and carry all the equipment on the backs of the men. Trails are not necessary, and the party can penetrate anywhere. Such a party would consist of a tsansitman, rodman, two axemen and a cook. The chief-of-party himself would act as rodman, and select the salient points. For the final line where the compass needle could not be used for backsights, a back-flagman and a stakeman should be added.

The locating engineer may have several such parties out in the vicinity, keeping a camp of his own on the trail, where profiles and maps may be made and compared, and supplies for the parties kept. Final locating parties need not stake out the line until they can go out over the contractor's roads.

For accuracy the stadia is better than the tape on slopes with the kind of tapemen usually available. For that reason I have used it on townsite work. For contour work (in which preliminary railway location consists in a large measure) it is ideal.—Engineering News.



Oil Heater of Simple Construction.

Intercolonial Ry. Ticket Collectors—Some six or seven ticket collectors have been placed on I.R.C. trains to relieve the conductors of ticket collections, etc., as an experiment. We are officially advised that until the plan has been tested it is uncertain whether it will be continued or extended over the whole line.

VALUE OF STATISTICS.

By D. C. Coleman, General Superintendent, Manitoba Division, C.P.R.

A statistical return with its row upon row of figures is to some of us an object of terror, if not of despair. We make one desperate effort to grasp the significance of the information here set forth with appalling detail, and then, baffled, we consign it to the bottom of the basket, in the vain hope that the man higher up will forget to place an accusing finger on the item which does us the least credit. Therein we do err. That bald and wearisome succession of figures, if we stop to analyze it, is crammed with human interest, and with incident. It tells us perhaps of demonstrations of the power of nature over the works of man, of blizzards reducing mighty locomotives to impotence, of perious of drought, drying up or poisoning the supply of water on which the locomotives depend; of slides on the slopes of the Rockies and the Selkirks demolishing in the twinkling of an eye the dykes and ramparts on which we have expended much toil and money; of mild sluggish prairie rivers transformed in a night to torrents tossing about like chips the proud structures that we have erected. But the story may be more personal, it may recount the triumphs and tragedies of business; it may tell us of the man who after many years of painful effort has finally reached a position of distinction in the service only to find himself unequal to the strain of maintaining himself there; it may tell us how the man who, equipped by Providence with ability, energy and strength, snatches victory after victory from the lap of destiny. Or the story possibly comes even more closely home to us. It may be of the mistakes we made in trusting this man or that, or in sacrificing this man or that, or in failing to foresee the effect of this or that event on this or that departure in policy. It may be of the fortunate results which crowned a happy stroke we made, or a particularly worthy piece of work we did. All this may appear fanciful, but it is not a whit overdrawn. Statistics, if they are properly prepared, are not dry reviews of petty details, but are mirrors in which are reflected the failures and triumphs of those who make the history of a business.

It has fallen to me on one or two occasions to investigate the compilation of statistical reports on various American railways, and as a C.P.R. man, I am proud to be able to say, that on no railway does the system of reports approach that on the C.P.R. for completeness and practical value. On the other leading systems in the Canadian West, where a large proportion of the mileage is in the hands of the construction department, elaborate statistics would be as yet of little value. On our system the efficiency of our statistical department, is due to the personal interest in its work taken by our President, and by the Vice President in control of our financial and accounting departments. They have employed exceptionally able statisticians, who in turn have received stimulation and encouragement from the enthusiasm with which the leading operating officers have availed themselves of the information offered. Here and there, as I have already intimated, are still unappreciative ones who look on the monthly returns as an affliction, but they are in a rapidly dwindling minority.

Our statistical reports are so prepared that a superintendent, if he will, can view the operation and maintenance of his district from every possible angle, and discern exactly where he is weak and where he is strong. Does he desire to judge the transportation work as it is handled by his chief train dispatcher, he does not have to be governed by impressions colored by the action and reaction of one personality on another. He can take up his forms and see exactly what the transportation expenses per gross ton mile have been on his district in the previous month, and in the corresponding month of the previous year, or in any other month with which a fair comparison could be made. He can also compare his cost with that on any other district on which he considers the conditions similar. If he desires to go into details, he has before him figures showing average size of trains in tons, the percentage of the actual load to the authorized rating of locomotives; the percentage of contents to capacity per loaded car, the pounds of coal consumed per ton mile, the percentage of empty or total freight car miles, the overtime paid to trainmen and enginemen per train mile, and the cost of actual train expenses per ton mile. To make these comparisons still more valuable there are marginal notes showing any disturbance of the factors since the previous year, so that allowance can be made for new conditions.

As to the cost of maintenance of way and structures, our system of handling accounts enables the superintendent to secure at any time the exact expense incurred under any particular item, and it is an easy matter for him to figure out the cost per mile of road, which is the unit of comparison. If he has this done for each month and compares it with the corresponding month of the previous year he can realize whither he is tending. For the higher officers, who have not access to the original accounts, the statistical department analyzes, and subdivides, the expenses on each district in the manner above indicated.

It is frequently stated that transportation statistics are of little value because they are so late in reaching the hands of the district officers. They are, of course, prepared as early as possible after the accounts of the previous month are closed. If a superintendent is making proper use of them the delay does not destroy their value. Let us presume that he receives January statistics on March 1. He notes, although he is probably aware of it, that his trains were light loaded and his overtime was very high. Is he supposed to sit still and wait until March statistics come to hand before he investigates what improvement has been made since January? Not at all. He can take his dispatchers' train sheets, and his accountant's books, and ascertain at once to what extent the lost ground has been recovered, and instead of waiting to see whether March figures are satisfactory or otherwise, he can be busily employed in manufacturing the results by improving his operations. We have already compared statistics to a mirror. We will further define it as a lady's mirror. Why does the fair lady pose before the mirror? So that she may note her beauty? Cynical proverbs to the contrary, I think not. She looks not for lines of beauty, but for defects, for evidences of the ravages of time or ill-health, or hard work. She seeks these in order to repair them by the artifices which to man are ever a mystery. She seeks not information for itself, but hints for improvement. So should it be with statistics. They should be searched, not merely for information, but for hints as to where and how improvements can be made.

In my opinion the successful operating officer on a railway will be the one who realizes the value of statistics in any form, and uses them not as a text for self-complacency, or for mourning or lamentation, but who, making intelligent allowance for all special conditions and circumstances, extracts benefit from the details given, and applies the lessons he has learned to the management of his territory.

The foregoing paper was read before the Western Canada Railway Club at

_____RAILWAY COMPANY.

COMPARISON OF PERFORMANCE OF FREIGHT TRAINS——DIVISION——DISTRICT,——191 —AND 191—

ITEM	Direction.	..... 191..	..... 191..	Per Cent. Increase	Per Cent. Decrease.	
Average weight of train in Equivalent Gross tons per mile	Eastbound Westbound Total					
Equivalent Gross tons hauled per Locomotive mile	Eastbound Westbound Total					Average Locomotive Capacity in Freight Service.
Equivalent Gross tons hauled per mile per 100% of Locomotive Capacity	Eastbound Westbound Total					Proportion of Eastbound to Westbound E. G. Ton Mileage. 191 / 191
Lbs. Coal consumed per 1000 Equivalent Gross tons hauled one mile	Eastbound Westbound Total					
Per cent. of Light running to Train Mileage	Eastbound Westbound Total					
Per cent. of Helping to Train Mileage	Eastbound Westbound Total					
Per cent. of Load to Authorized Rating	Eastbound Westbound Total					
Per cent. of Freight to Actual Gross weight of Train	Eastbound Westbound Total					Proportion of Eastbound to Westbound Freight Ton Mileage. 191 / 191
Per cent. of Contents to Capacity per loaded car	Eastbound Westbound Total					
Per cent. of Empty to Total Freigbt car miles	Eastbound Westbound Total					
Overtime, Crew Hours per 1000 Train miles Engine Crews Train Crews						.....% of Overtime due to Mechanical Defects. .....% of Overtime due to Mechanical Defects.

MONTREAL,——— 191 —,——— Auditor of Disbursements.

Winnipeg, recently. In the discussion which followed S. J. HUNGERFORD, Superintendent of Rolling Stock, Canadian Northern Ry., said:—I entirely agree with Mr. Coleman in regard to the value of statistics. The subject is worth a great deal of thought. I am unable to see how anyone can carry on any business successfully without having accurate statements available showing the unit cost of operation in connection with each class of work. The unit cost of train operation may exactly indicate the efficiency of operation, but when we come to consider maintenance costs the matter is much more complex, as it is possible of course to reduce expenditure below that absolutely necessary to maintain and for a short time at least it will appear that the cost of operation is abnormally low and that a high state of efficiency exists, whereas the actual condition is quite the reverse.

E. T. SPIDY, Assistant to General Locomotive Foreman, C.P.R. shops: I think Mr. Coleman has put forward one of the most reasonable arguments I have ever heard in favor of efficiency systems. As he said, a record compared with the previous record gives us a base to work on. Without the previous record and knowledge of affecting conditions, half the comparative value of the record is gone. What is deduced from the monthly report can also be deduced from the weekly report, and equally well to the individual work of each employe. That is the basis of the system we are applying to each machine at our locomotive department. Our records are our statistics and their value to locate the detail defects which would otherwise be missed, cannot be over-estimated. As it is impossible to apply a remedy until the defect is located, likewise we cannot consider ourselves efficient until we have corrected our own defects. To do this, accurate records or statistics are absolutely necessary. First find your defects, remedy, and obtain results.

G. B. WILLIAMS, Car Service Agent, C.P.R.: The question of the accuracy of the information from the subordinate offices, while not dealt with by Mr. Coleman, is worth considering. For instance, take the important item of fuel consumption. We are all aware of the fact that it is to a great extent approximated, and sometimes tickets covering coal handled are not made up as carefully as they should be. The same might be applied to oil issues. The close checking of each item is an important factor in the compilation of statistics. On short notice and having just heard the paper read, I am hardly prepared to go into this further except to comment on the difference between present day statistics and those of 10 or 12 years ago. While our present method is undoubtedly the better and continually improving, I am inclined to think it is not as plain to the individual, as it is to the officer. I can remember when engineers, firemen and others would anticipate the arrival of a locomotive performance sheet to ascertain their relative standing, and there was always more or less contention for a place, and very often they would ask for check of tickets if they considered that errors had occurred. Mr. Coleman's paper attracts attention to the value of information given from statistical offices and should stimulate interest in maintaining a knowledge of railway performance in the various departments.

D. C. COLEMAN,—I think there is a great deal in what Mr. Williams says. For instance, in the matter of fuel tickets, the system of all railways seems to be based in the matter of fuel supply on approximation. I don't know that that could be checked up without very great expense. It certainly does affect the statistics of a master mechanic who is trying to check up the record of an individual locomotive. in the matter of oil and fuel consumption. I agree with what Mr. Hungerford says with reference to maintenance expenses. It is possible for a superintendent to allow his track to run down without the effects being immediately apparent, but if the statistics are checked up for a long term it will be found that the superintendent who lets his track run down is paying for it in the form of accidents, and that the motive power department, or the road which allows its motive power to run down is paying for it in the form of overtime.

S. J. HUNGERFORD:—I wish to express approval of the last point made by Mr. Coleman. I am firmly of the opinion that the way to maintain efficiently and economically is to maintain all the time, and I am unable to see any advantage in curtailing expenses abnormally for a time and later incur the necessary expense, and also the loss of efficiency usually connected with an extra effort to catch up.

S. C. BRAY:—The statistical report received by the general storekeeper is very handy. For the division we have it in the office by the 17th or 18th of the month, and for the whole Western Lines by the end of the month for the previous month's business. We can make comparisons one month with the previous month, and with the same month of the previous year to get the average percentage of business done at each point, also for the division by the month as well as for the Western Lines. We have the statistics for several years past filed in a convenient place for reference at any time. As the statements are received monthly, the percentage of business handled at each point is noted and if it does not show a satisfactory turn over of stock the matter is referred to those responsible, for an explanation.

S. J. HUNGERFORD:—Would it be in order to ask Mr. Coleman to give a general idea of how train operation statistics are arrived at. I am not asking for specific information, but would like a general idea.

D. C. COLEMAN:—What I presume Mr. Hungerford refers to is the cost of handling 1000 equivalent gross tons one mile. That form is compiled in the following way: The train mileage is arrived at from the conductors' train journals. The wages of engineers, firemen, conductors and brakemen are taken off by the timekeeper on each district separately, and work service, passenger service and mixed service are taken off separately from the freight service, and the total of the freight service is arrived at. Then they take the fuel figures as shown on the conductors' train journals and oil figures as furnished by the mechanical department. I think those are all the items used. I don't know if I have made myself clear or not, but these are the only items included—the wages of the train men, the fuel and the oil. The basis of all our reports is the conductors' train journal.

J. T. WARDE, chief clerk, General Car Foreman, C.P.R.:—In this matter of statistics, the benefit shows itself in the pay roll, as at the end of the month, we invariably come out within a few dollars of the estimate, and this shows the benefit of statistics in our department.

R. R. NEILD, General Foreman, Locomotive Shops, C.P.R.:—We should all know the value of statistics. I don't know how we could run a railway or any other business without them. We derive a great deal of benefit from the statistics that are drawn up in the mechanical department, although we run up against some errors occasionally. We find what our system is costing us each week, and it helps us to know just how we are to come out at the end of the month, and also what each individual engine is costing us, and if it is going too high we have a chance to look out for the leaks. Of course in the mechanical department, statistics are no use if they come up two or three months after the engine is turned out of the shops. We get the figures weekly, which gives us an opportunity of checking up. I would have liked Mr. Coleman to have told us something about the general statistics drawn up as to the depreciation of rolling stock, machinery, etc. We should know almost at a glance just the value of our rolling stock and machinery of every description. I would like to hear from Mr. Coleman as to how they arrive at the depreciation values.

D. C. COLEMAN:—As far as rolling stock is concerned, there is an arbitrary charge. I cannot tell from personal knowledge what it is, but I believe the Canadian roads use an arbitrary arrived at by U.S. railways at the instance of the Interstate Commerce Commission. I don't know that there is anything written off for machinery. When a machine is replaced it is debited with the full price of the machine replaced, and balance of cost charged to special replacement accounts.

Birthdays of Transportation Men in May.

Many happy returns of the day to—

W. R. Baker, Secretary, and Assistant to President, C.P.R., Montreal, born at York, Eng., May 25, 1852.

G. S. Cantlie, General Superintendent Car Service, C.P.R., Montreal, born there May 2, 1867

M. Donaldson, M. Can. Soc. C.E., Superintendent, Ottawa Division, G.T.R., Ottawa, Ont., born near Edinburgh, Scotland, May 1, 1851.

A. E. Duff, District Passenger Agent, G.T.R., Toronto, born at Sherbrooke, Que., May 1, 1872.

G. C. Dunn, District Engineer, G.T.P.R., Winnipeg, born at Quebec, May 13, 1862.

J. D. Evans, Chief Engineer, Central Ontario Ry., Trenton, Ont., born at Goderich, Ont., May 27 ,1843.

E. T. Galt, President, Alberta Ry. and Irrigation Co., Montreal, born at Sherbrooke, Que., May 24, 1850.

G. H. Hedge, Master Mechanic, Central Division, Canadian Northern Ry., Winnipeg, born at Neath, Wales, May 26, 1865.

R. B. Hepburn, President and General Manager, Ontario and Quebec Navigation Co., Ltd., Picton, Ont., born there, May 27, 1876.

G A. Hoag, Superintendent, Central Ontario Ry., Trenton, Ont., born at Walker's Falls, Ont., May 31, 1866.

W. T. Huggan, Accountant and Auditor, Prince Edward Island Ry., Charlottetown, P.E.I., born at Halifax, N S., May 24, 1851.

J. Irwin, Superintendent, District 3, Canadian Northern Ry., Dauphin, Man., born at Clinton, Ont., May 28, 1866.

W. Marshall, Superintendent, Ontario Division, C.P.R. Telegraphs, Toronto, born at Garden Island, Ont., May 18, 1859.

H. B. Sherwood, Superintendent, Bay of Quinte Ry., Napanee, Ont., born at Auburn, N.Y., May 25, 1847.

W. Stapleton, District Passenger Agent, Canadian Northern Ry., Saskatoon, Sask., born at Bristol, Eng., May 20, 1884.

E. Tiffin, Member, Government Railways Managing Board and General Traffic Manager, Government Railways, Moncton, N.B., born at Hamilton, Ont., May 5, 1849.

J. H. Walsh, General Manager, Quebec Central Ry., Sherbrooke, Que., born at Quebec, May 12, 1860.

H. K Wicksteed, B.A.Sc., M. Can. Soc. C. E., Chief Engineer of Surveys, Mackenzie, Mann & Co., Ltd., Toronto, born at Quebec, May 25, 1855.

James Yeo. ex-Roadmaster, Intercolonial Ry., Riviere du Loup, Que., born at Bideford, Devonshire, Eng., May 1, 1830.

Orders by Board of Railway Commissioners.

Beginning with June, 1904, we have published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed our paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates given of orders, immediately following the numbers, are those on which the hearing took place, and not those on which the orders were issued. In many cases orders are not issued for a considerable time after the dates assigned to them.

16152. March 21.—Authorizing C.P.R. to rebuild bridge 176.9 over Bow River, Calgary subdivision, Alta.

16153. March 18.—Rescinding order 12783, Jan. 18, 1911, in complaint of Dawson board of trade vs. White Pass and Yukon Route.

16154. March 22.—Authorizing C.P.R. to build its Lacombe Easterly branch across highways from mileage 140.31 to 143.61, Alta.

16155. March 22.—Relieving C.P.R. from further protection at public highway near Griswold, Man.

16156. March 21.—Authorizing C.P.R. to build spur for Vancouver Lumber Co., Merritt, B.C.

16157. March 22.—Authorizing C.N.O.R. to build spur for Alexander Bruce & Co.'s tie preserving plant near Fort Frances, Ont.

16158. March 20.—Approving T. H. & B.R. rules for operation of automatic block signals.

16159. March 22.—Approving Campbellford, Lake Ontario and Western Ry. location through Oshawa, and revised location as previously approved by order 11947, through East Whitby tp., Ont., mileage 29.1 to 34.2.

16160. March 22.—Authorizing Montreal and Southern Counties Ry. to build from G.T.R. property east of Front St., St. Lambert, Que., to Central Vermont Ry., crossing Victoria Ave. overhead.

16161. March 21.—Ordering G.T.R. to file special tariff or supplement to existing tariff C.R.C. 1686, to take effect not later than Apr. 8, establishing rate of $3 a car for switching lumber from F. McGibbon & Sons' docks, Sarnia, Ont., to storage yard and mill, for storage, sorting or dressing and reshipment by G.T.R.

16162. March 21.—Authorizing G.T.R. to build siding for W. Laking, Haliburton, Ont.

16163. March 22.—Ordering G.T.R. to remove at once, shrubs, etc., at crossing of first highway east of Waterdown station, Ont.; cars not to be left standing within 75 ft. of crossing.

16164. March 20.—Approving G.N.R. standard plan of portable stations.

16165. March 25.—Defining express delivery and collection limits for Hull, Que.

16166. March 22.—Authorizing G.T.R. to build spur for Steel and Radiation, Ltd., St. Catharines, Ont.

16167. March 23.—Authorizing highway board of Grand Falls parish, N.B., to build highway across C.P.R.

16168. March 23.—Approving location of C.P.R. Suffield to Kipp branch from main line near Suffield to mileage 21, Alta.

16169. March 13.—Authorizing Georgian Bay and Seaboard Ry., (C.P.R.) to build across Jackson St., Bethany, Ont.

16170. March 5.—Approving location of G.T.P.R. station at Henry House, Alta.

16171. March 25.—Approving Supplement 8 to Express Classification for Canada 2.

16172. March 25.—Correcting errors in revised plan of G.T.P. Branch Lines Co.'s Cutknife branch.

16173. March 25.—Amending order 16076, Mar 5, re C.P.R. Boissevain-Lauder branch.

16174. March 23.—Authorizing city of Saskatoon, Sask., to carry 20th St. across C.P.R. at rail level.

16175. March 25.—Amending order 16064, March 1, re Bridgeburg bridge, Ont., by adding clause that municipality shall maintain same.

16176. March 26.—Authorizing G.T.R. to build bridge over Clubbiness Creek and over Holland River, Northern Division, Ont.

16177. March 25.—Approving location of G.T.P.R. station at Houston, B.C.

16178. March 25.—Approving Kettle Valley Ry. location from mileage 43.92 to 55, northwest of Midway, B.C.

16179. March 26.—Approving location of three G.T.P.R. unnamed stations in Coast district, B.C.

16180. March 28.—Ordering C.N.R. to put its main line in Saskatoon yard in good shape and condition before June 1, and pending completion of work, trains not to exceed six miles an hour.

16181. March 28.—Authorizing Lachine, Jacques Cartier and Maisonneuve Ry. (G.T.R.) to cross certain streets in Montreal, by overhead crossings, subways and level crossings.

16182. March 25.—Rescinding order 16122, March 14, and amending order 16095, Mar. 7, re C.N.O.R. taking lands in Trenton.

16183. March 28.—Rescinding order 13060, Feb. 21, 1911, and approving M.C.R. bylaw authorizing C. F. Daly, V.P., L. W. Landman, G.P.A., W. C. Rowley, G.F.A. and J. L. O'Brien, Chief of Tariff Bureau, to issue tariffs of tolls.

16184. March 4.—Rescinding order 15938, Feb. 6, in so far as it authorizes building of Lachine, Jacques Cartier, and Maisonneuve Ry., (G.T.R.) across Rachel St., Montreal.

16185. March 26.—Ordering G.T.R. withing 90 days to install electric bell at crossing just east of Clarkson station, Ont., 20% to be paid from railway grade crossing fund.

16186. March 26.—Authorizing Saskatchewan government to build highway across C.N.R. in s. w. ¼ sec. 30, tp. 47, r. 26, w. 2 m.

16187. March 27.—Relieving C.P.R. from further protection at first highway south of St. Vincent Rd., mileage 91, near Owen Sound, Ont.

16188, 16189. March. 28, 26.—Authorizing C.P.R. to build three spurs from main line in s. w. ¼ sec. 28, tp. 23, r. 29, w. 4 m., into and through blocks 24, 25, and 30, and block G. in subdivision of s.e. ¼ sec. 28, tp. 23, r. 29, w. 4 m., and spur for Calgary Brewing and Malting Co., at Coleman, Alta.

16190. March. 28.—Rescinding order 15683, Dec. 23, 1911, and recommending to Governor-in-council for approval G.T.R. operating department rules and regulations.

16191. March 27.—Authorizing G.T.P. Branch Lines Co. to cross with its Regina-Moose Jaw Branch, the C.P.R. Moose Jaw Northwest Branch by undergrade crossing at Moose Jaw, Sask.

16192. Mar. 29.—Authorizing C.N.O.R. to cross Sydenham Lake, Loughborough tp., and rescinding order 15026, Oct. 16, 1911, giving similar authorization.

16193. Mar. 26.—Approving revised location of Algoma Central and Hudson Bay Ry. between mileage 123.74 and 130.87 and connection with N.T.R. at Grant, Ont.

16194. Mar. 28.—Authorizing British Columbia Public Works Department to carry Park Ave., over C.P.R., in Slocan.

16195, 16196. Mar. 28.—Authorizing C.P.R. to build additional track across highways at Basswood and Birtle, Man.

16197. Oct. 9.—Authorizing C.P.R. to divert highway at mileage 119.7, Medicine Hat subdivision, Alta.

16198. Mar. 29.—Authorizing V. V. and E. Ry. and N. Co. to build crossings in Sumas, B.C.

16199. Mar. 8.—Authorizing G.T.R. to take S. McLean's lands, being part of lot 13, r. 1, south of Longwood's road, Ekfrid tp., Ont.

16200. Apr. 1.—Authorizing M.C.R. to use bridge over Bear Creek, mileage 57.3, St. Clair Division.

16201. Mar. 29.—Authorizing G.T.P.R. to build spur for Imperial Oil Co., Edmonton, Alta.

16202. Mar. 30.—Authorizing G.T.R. to rebuild bridge at mileage 7.47, District 8, Northern Division, Ont.

16203. Mar. 30.—Authorizing C.P.R. to rebuild bridge across Muskrat River, Chalk River subdivision, Ont.

16204. Mar. 30.—Authorizing C.P.R. to build spur for A. F. Vincent, near Mile End station, Montreal.

16205. Mar. 21.—Authorizing C.N.O.R. to build transfer track to connect its Sudbury branch with Algoma Eastern Ry. through Sudbury.

16206, 16207. Mar. 30, Apr. 1.—Approving location of C.N.R. Calgary-Strathcona line through tp. 40, r. 26, mileage 0 to 4.55, and C.N.R. location through tps. 14 and 9, r. 26 and 25, w. 4 m., Alta., mileage 65.05 to 102.50.

16208. Mar. 30.—Dismissing complaint of C. W. Deaver, Viscount, Sask., re cattle pass on G.T.P.R.

16209. Apr. 1.—Approving location of C.P.R. station at Lydiatt, Man.

16210. Mar. 30.—Dismissing complaint of residents of Brownlee, Sask., re C.P.R. car supply.

16211. Apr. 1.—Authorizing Kootenay Central Ry. (C.P.R.) to open for freight traffic its line from Colvalli to Bull River, 9.2 miles.

16212 to 16214. Apr. 1.—Authorizing C.P.R. to build spurs for Dominion Match Co., New Westminster District, B.C.; Sudbury Construction and Machinery Co., Sudbury, Ont.; and Canadian Hanson and Van Winkle Co., near Morrow Ave., Toronto.

16215. Mar. 30.—Authorizing C.N.R. to cross Calgary and Edmonton trail, Bailey, Barnett, and Oliver Aves. and Matthias St., and to close certain lands, Lacombe, Alta.

16216. Mar. 30.—Authorizing G.T.R. to rebuild bridge across Narrows at milepost 120.39, District 9, Northern Division, Ont.

16217. Apr. 2.—Authorizing C.P.R. to rebuild bridge 81.0, Sudbury Division, Ont.

16218. Apr. 2.—Approving revised location of C.P.R. Wilkie to Anglia branch from Pheasant Hills branch, sec. 6, tp. 40, for 35.34 miles to sec. 22, tp. 34, r. 19, w. 3 m., Sask.

16219 to 16221. Apr. 2, 1.—Approving location of C.N.O.R. Sudbury-Port Arthur line through unsurveyed territory, Thunder Bay District, mileage 343.15 to 363, and revised location Algoma District, mileage 209.1 to 219.43, from Sudbury Jct.; and revised location of Montreal-Port Arthur line through unsurveyed territory Sudbury District, mileage 270.9 to 272.83.

16222. Apr. 2.—Approving location of C.N.O.R. Calgary - Strathcona branch through tps. 47 and 52, r. 24 and 26, w. 4 m., and part of Strathcona, Alta.

16223. Apr. 3.—Approving Klondike Mines Ry. Standard Passenger tariff C.R.C. 3.

16224. Apr. 3.—Authorizing C.P.R. to build its Moosejaw southwesterly branch across four highways, mileage 23.22 to 36.65.

16225. Apr. 3.—Ordering that Vancouver, Fraser Valley and Southern Ry. local tolls on lumber, etc., shall be same as charged by C.P.R. and G.N.R. for similar distances within their corresponding territories and that joint through rates on lumber be on basis of 1c per 100 lbs. etc.

16226 to 16228. Apr. 3.—Disallowing G.T.P.R., C.N.R. and C.P.R. increased tolls from Westfort, Port Arthur, Fort William, Ont., from Apr. 1, and restoring lower tolls in effect immediately before that date.

16229. Apr. 4.—Extending to Oct. 1, time for completion of C.N.R. spur St. Boniface, Man., authorized by order 13322, Mar. 29, 1911.

16230. Apr. 4.—Extending for six months from Mar. 30, time for completion of Algoma Central and Hudson Bay Ry. extension to Bruce St., Sault Ste. Marie, Ont.

16231. Apr. 3.—Correcting errors in G.T.P. Branch Lines Co. Regina-Moose Jaw branch location plan.

16232. Mar. 25.—Approving location of C.P.R. station at Griffin, Sask.

16233. Apr. 8.—Approving order of Exchequer Court of Canada appointing F. W. Blair, D. E. Waters, and N. Erb receivers of Pere Marquette Rd. in Canada.

16234. Mar. 11.—Rescinding order 16004, Feb. 15, and authorizing C.N.O.R. to cross C.P.R. at Lambton, by undercrossing.

16235. Apr. 1.—Amending order 15558, Dec. 5, 1911, by adding clause directing city to reimburse C.P.R. for services of flagman, etc., at Talbot St. crossing, Winnipeg.

16236. Apr. 3.—Authorizing Lachine, Jacques Cartier and Maisonneuve Ry. (G.T.R.) to cross Montreal St. Ry. by overhead bridges at three streets.

16237. Apr. 1.—Ordering that C.N.R. and C.P.R. protect crossing on Main St., Gladstone, Man., by watchman.

16238. Apr. 1.—Ordering G.T.P.R. to grade a new crossing parallel with Main St. and open Beaver Hills Road across its right of way, Ituna, Sask.

16239. Apr. 2.—Dismissing application of residents in Carrot Creek vicinity, Alta., re G.T.P.R. siding.

16240. Apr. 1.—Dismissing application of farmers in Pleasant Point vicinity near Carberry, Man., to order C.P.R. to build a siding.

16241. Apr. 1.—Ordering C.N.R. to fence its right of way now unfenced along the Qu'Appelle, Long Lake and Saskatchewan Ry. between Saskatoon and Regina, under penalty of $50 a day after Nov. 1.

16242. Apr. 2.—Ordering G.T.P.R. to cease discriminating in carriage of freight in favor of its contractors as against general public over its line from Hinton, Alta., west thereof, subject to fine of $100.

16243. Apr. 6.—Authorizing C.N.O.R. to cross four highways in Nepean tp.

16244. Apr. 6.—Authorizing C.N.R. to cross with its Calgary-Edmonton branch six highways in Alberta.

16245. Apr. 1.—Authorizing C.N.R. to build spur to power house, Saskatoon, Sask.

16246. Apr. 3.—Authorizing C.N.R. to cross five highways in Strathcona, Alta.

16247, 16248. Apr. 4.—Approving location of Campbellford, lake Ontario and Western Ry. (C.P.R.), Glen Tay to Belleville branch from mileage 15 across Oso, Bedford, and Hinchinbrooke tps., crossing Kingston and Pembroke Ry., near Parham station to westerly boundary of Hinchinbrooke tp., at mileage 38.5; and location of Glen Tay to Cobourg line from mileage 38.5 to 58.5 in Lennox and Addington counties, Ont.

16249, 16250. Apr. 4, 6.—Authorizing G.T.P.R. to build bridges across Fraser River at mileage 316 and 274 west of Wolf Creek, B.C.

16251. Apr. 2.—Dismissing G.T.P. Branch Lines Co. application re Tofield-Calgary branch right of way.

16252. Apr. 3.—Authorizing G.T.P. Branch Lines Co. to cross C.P.R. Brandon branch

overhead in n.w. ¼ sec. 26, tp. 10, r. 18, w. p.m., Man.

16253, 16254. Apr. 2.—Authorizing C.P.R. to take lands for construction of permanent snow fences in Pickering tp., Ont.

16255. Apr. 4.—Relieving C.P.R. from erecting fences on portion of its Calgary subdivision. Alta.

16256, 16257. Apr. 6.—Authorizing G.T.P. Branch Lines Co. to cross with its Calgary Boundary branch the C.P.R. Aldersyde branch in n.e. ¼ sec. 4, tp. 12, r. 23, and n.w. ¼ sec. 26, tp. 19, r. 28, w. 4 m., interlocking plants to be installed.

16258. Apr. 6.—Authorizing G.T.P. Branch Lines Co. to build Y connecting its Alberta coal branch with Yellowhead Pass Coal and Coke Co.'s spur.

16259. Apr. 9.—Rescinding order 8462, Oct. 29, 1909, and ordering G.T.P.R. to build overhead crossing on Fort Saskatchewan trail, north Edmonton, Alta., plans to be filed within 30 days and work to be completed within 90 days from approval, under penalty of $100 a day.

16261. Apr. 9.—Authorizing G.T.R. to build spur into Western Foundry Co.'s premises, Wingham, Ont.

16262 to 16264. Apr. 9.—Authorizing C.P.R. to rebuild bridges 22.5, Newport subdivision; 32.6, Ottawa subdivision; and 24.8, 30.7, 32.2 and 35.8, Farnham subdivision.

16265. Apr. 9.—Authorizing C.P.R. to build its Moose Jaw southwesterly branch across highway at mileage 36.63, Sask.

16266. Apr. 10.——Approving C.N.O.R. revised location in Litchfield tp., mileage 59.13 to 59.73 from Ottawa.

16267. Apr. 10.—Approving location of C.N.R. Montreal-Port Arthur line through Maclennan, Scadding, Street and Davis tps., Sudbury District, mileage 405.36 to 421.09 from Montreal.

16268. Apr. 10.—Authorizing C.N.O.R. to connect with C.P.R. at mileage 2, in Port Arthur, for construction purposes only.

16269. Apr. 9.—Authorizing C.N.R. to build its Calgary-Strathcona line across 25 highways in Alberta.

16270. Apr. 10.—Dismissing application of town of Battleford, Sask., re C.N.R. branch passenger service.

16271. Apr. 10.—Dismissing complaint of Namaka Farmers Association no. 122, Namaka, Alta., re C.P.R. mail service.

16272. Mar. 16.—Ordering C.N.O.R. to build concrete foot subway through Deaf and Dumb Institute property, near Belleville, Ont.

16273. Apr. 9.—Approving revised location of C.P.R. Lacombe Easterly branch, mileage 100.07 to 146.10, Alta.

16274. Apr. 10.—Authorizing C.P.R. to rebuild bridge 30.5, Temiskaming subdivision.

16275. Apr. 11.—Amending order 15995, Feb. 16, general order re fireguards.

16276. Apr. 11.—Postponing effective dates of M.C.R. tariff C.R.C. 1874; G.T.R. C.R.C. E. 2376, as amended by supplement 1, and Wabash Rd. C.R.C. 566 as amended by supplement 1, advancing rates on anthracite coal from Niagara frontier to Canadian points.

16277. Apr. 11.—Authorizing South Ontario Pacific Ry. (C.P.R.) to build its Guelph Jct. to Hamilton line under Hydro-Electric Power Commission's wires, at mileage 13.32 from Guelph Jct., Ont.

16278. Apr. 9.—Approving location of eight G.T.P.R. stations in Coast and Cassiar Districts, B.C.

16279. Apr. 11.—Authorizing G.T.P. Branch Lines Co. to operate over crossing of its Melville-Regina branch with C.P.R. in Saskatchewan, interlocker being completed.

16280, 16281. Apr. 11, 12.—Approving location of C.N. Alberta Ry., mileage 166.01 to 192.83 and authorizing it to occupy portion of G.T.P.R. about mileage 185.5; and approving location from mileage 192.83 to 222.79.

16282. Apr. 12.—Authorizing C.N.R. to build bridge across Pembina River, s.w. ¼ sec. 29, tp. 53, r. 7, w. 5 m.

16283. Apr. 12.—Approving C.N.O.R. revised location in Ferris tp., mileage 339.5 to 340.72.

16284. Apr. 12.—Authorizing C.N.R. to build bridge across Macleod River in west half of sec. 33, tp. 52, r. 17, w. 5 m.

16285. Apr. 10.—Authorizing Esquimalt and Nanaimo Ry. to take lands for railways purposes, lots 54 and 55 of Lime Bay, sec. 31, Victoria West.

16286 to 16289. Apr. 11, 10.—Authorizing C.P.R. to build spurs for Alsip Brick, Tile and Lumber Co., St. Boniface, Man., Wolverton Milling Co., Wolverton, Ont., H. Hilton and Sons, Winnipeg, and to ballast pit near Marquette, Man., and to cross four highways to same.

16290. Apr. 11.—Authorizing C.N.R. to cross public road between s.e. ¼ sec. 3, tp. 39, and n.w. ¼ sec. 33, tp. 38, r. 27.

16291, 16292. Apr. 11. — Authorizing C.N.O.R. to cross two public roads in Fitzroy tp.

16293 to 16296. Apr. 12.—Authorizing C.P.R. to rebuild five bridges on its Macleod, Sherbrooke, Ottawa, Mountain and Farnham subdivisions; bridges 54.4, Muskoka subdivision, 92.3, Boundary subdivision, and 54.0 over new cut Macleod subdivision.

16297. Apr. 12.—Authorizing Roxborough tp., Ont., to build highway across C.P.R. near Mountain.

16298. Apr. 12.—Authorizing C.P.R. to build spur into Canadian Carbon Co.'s premises, Winnipeg.

16299. Apr. 12.—Authorizing C.N.O.R. to cross public road between cons. 1 and 2, Ottawa Front, Nepean tp.

16300. Apr. 12.—Approving details of interlocking plant by G.T.P. Branch Lines Co. at crossing of C.P.R. Langdon Branch, Alta., authorized by order 15088, Oct. 13, 1911.

16301. Apr. 12.—Authorizing C.P.R. to build bridge 65.3 over irrigation siphon, Calgary subdivision. Alta.

16302. Apr. 13.—Approving Midland Ry. of Manitoba (G.N.R.) bylaw authorizing C. E. Dafoe, Superintendent and General Freight and Passenger Agent, to issue tariffs of tolls.

16303. Apr. 13.—Authorizing C.N.O.R. to cross public road between lots 10 and 11, con. 4, March tp.

16304. April 11.—Ordering C.P.R. to build station and appoint agent at St. Francois de Salle, Que., and file plans within 30 days showing side track.

16305. April 12.—Ordering C.P.R. by May 1 to make Winchester, Ont., a regular stop for trains 21 and 22.

16306. April 12.—Naming express collection and delivery limits for Chapleau, Ont.

16307. Feb. 15.—Approving Canadian Northern Ontario Ry. branch to Bond St., and spur into William St., Oshawa.

16308. April 15.—Certifying correction to G.T.P. Branch Lines Co. Regina-Boundary branch location plan.

16309, 16310. April 13.—Authorizing C.P.R. to rebuild bridge 33.9 and 103.9 Edmonton and Muskoka subdivisions.

16311. April 15.—Approving location of Central Ry. of Canada Montreal to Midland line, from Oka, mileage 31 to south side of highway at Carillon, mileage 45.61.

16312. April 3.—Authorizing C.P.R. to build additional track across street railway at Pacific Ave., Fort William, Ont.

16313. April 11. — Ordering Canadian Northern Ry. to build road crossing, etc., and grade roadway to loading platform, elevator and team track at Pelly, Sask., by May 1, under penalty of $10 a day.

16314. April 12.—Ordering that supplement 6 to G.T.R. tariff C.R.C. E. 1432 and supplement 5 to C.P.R. tariff C.R.C. E. 1286 may become effective June 1, re order 15844, Jan. 27, in connection with Consumer's Cordage Co., Montreal.

16315. April 12.—Ordering C.P.R. to build farm crossing for F. W. Dodwell, Austin, Man.

16316. April 13.—Authorizing C.P.R. to build spur for William Davies Co., near Front and Overend Sts., Toronto.

16317. April 13.—Certifying correction to G.T.P. Branch Lines Co. Regina-Boundary branch location plan.

16318. April 13.—Authorizing G.T.R. to build siding for Ridgeway Milling Co., Ridgeway, Ont.

16319. April 12.—Authorizing G.T.R. to build additional track across Pape Ave., Toronto.

16320. Apr. 13.—Approving revised location of Canadian Northern Ry. Calgary-Strathcona branch, mileage 72.58 to 81.75, Alta.

16321. April 15.—Approving agreement between C.P.R. and C.N.R. for joint facilities at Regina, Sask.

16322. April 15.—Approving location of C.P.R. station at Cutknife, Sask.

16323. April 12.—Ordering C.N.O.R. to install electric bell at Manvers road crossing east of Bowmanville station.

16324. April 15.—Ordering Dominion Atlantic Ry. before July 1 to install electric bell east of Berwick station, N.S., 20% of cost to be paid from railway grade crossing fund.

16325. April 11.—Approving location of Campbellford, Lake Ontario and Western Ry. Glen Tay to Cobourg line from mileage 88.21 to 106.17 from Glen Tay, Ont., and authorizing it to take possession of certain portions of G.T.R. right of way.

16326. April 13.—Approving location of James Bay and Eastern Ry. (C.N.R.) station grounds at Demeules, Que.

16327. April 15.—Authorizing C.P.R. to build additional tracks across highways at Tantallon, Esterhazy and Killaley, Sask.

16328. April 12.—Ordering C.P.R. to widen crossing at King St., Walkerton, Ont.; bell question reserved for further consideration.

16329. April 15.—Authorizing G.T. Pacific Ry. to build spur for Edmonton Portland Cement Co., near Edmonton, Alta.

16330. April 15.—Authorizing Canadian Northern Ontario Ry. to build bridge across the Muskegogama river at mileage 94 from Sudbury Jct.

16331. April 18.—Amending order 13357, Mar. 30, 1911, re collections and deliveries in municipalities by express companies. This order is given fully under heading of Among the Express Companies on another page.

16332. April 17.—Authorizing Michigan Central Rd. to rebuild bridge over Grand River, Ont.

16333. April 16.—Approving character of Hill drain across Pere Marquette Rd. being built by Aldborough tp., Ont.

16334. April 16.—Approving location of Canadian Northern Quebec Ry. station at Cap Sante.

16335. April 17.—Approving Georgian Bay and Seaboard Ry. (C.P.R.) plan B re crossing at Jackson St., Bethany, Ont., and rescinding order 16169, Mar. 13, in the same connection.

16336. April 17.—Approving location of C.P.R. station at Claresholm, Alta.

16337. April 17.—Authorizing C.P.R. to build nine spurs for Birds Hill Sand Co., near Winnipeg.

16338, 16339. April 13, 15.—Approving location of G.T. Pacific Branch Lines Co.'s stations at Bremen and Meacham, Prince Albert branch; and Stony Beach and Keystown Regina-Moose Jaw branch.

16340. April 17.—Authorizing G.T.R. to build spur for Barber-Ellis, Ltd., Brantford, Ont.

16341. April 17.—Ordering C.P.R., G.N.W. and C.N.R. Telegraph Cos. to deliver telegrams free of charge within corporate limits of St. Boniface, Man.

16342. April 18.—Authorizing G.T.R. to build spur for Connell Anthracite Mining Co., Carlaw Ave., Toronto.

16343. April 18.—Approving plans for Canadian Northern Ry. standard portable station for use on eastern lines.

16344. April 18.—Approving location of James Bay and Eastern Ry. (C.N.R.) station grounds at Chute a l'Ours, Que.

16345. April 18.—Dismissing application of Stockton and Mallinson Regina, Sask., re Dominion Ex. Co.'s rates.

16346. April 18.—Authorizing city of Fort William to build Pacific Ave. across C.P.R.

Grand Trunk Pacific Railway Telegraphs

We are officially advised that the construction programme for this year comprises 840 miles of poles, and 2,404 miles of wire, including the erection of a copper metallic circuit for telephone train dispatching, from Prince Rupert to mileage 250. The line is at present complete west of Winnipeg to mileage 1,073, which is 30 miles beyond the summit of the Rocky Mountains. The total mileage complete and in operation is 1,964½ miles of pole line, and 5,971½ miles of wire. Following is a list of the location and mileage of this year's construction:—

	Mileage Pole.	Wire.
Prince Rupert eastward	149	798
Milepost 1073, from Winnipeg, west	50	200
Regina-Boundary branch	143	286
Regina-Moose Jaw branch	56	112
Moose Jaw and West	57	114
Young-Prince Albert, to complete	51	236
Biggar-Calgary branch	60	60
Oban to Battleford	57	114
Cutknife branch	50	50
Tofield-Calgary branch, to complete	94	288
Alberta Coal branch	50	100
Mountain Park Coal branch	23	46
Total	240	2,404

The American Society of Civil Engineers will hold its annual meeting at Seattle, Wash., June 25 to 28, instead of at Saratoga, N.Y., as first arranged.

Sir Donald Mann is reported to have purchased a large area of coal lands in the Groundhog Valley, B.C., which, it is said, he will proceed to develop at once.

During Feb., 14 employes were killed and eight were injured, in the course of their work in connection with railway construction in the Dominion. Of the fatalities, 13 were due to a premature explosion of dynamite on the C.N.R., near Fort Frances, Ont., the other was due to the man being run over by a train.

Canadian Pacific Railway Construction, Betterments, Etc.

Entrance to Boston, Mass.—A resolution was unanimously passed by the Masschusetts State Legislature, April 8, asking the C.P.R. to extend its lines through the State to Boston.

Halifax, N.S.—It is said that a conference between business men and others interested in the development of Halifax, and Sir Thos. G. Shaughnessy, took place, April 10, with the object of securing the entrance of the company's lines into the city. At present C.P.R. trains are hauled in over the Intercolonial Ry. by the latter's locomotives. Press reports state that the Government has under consideration a proposition for granting the C.P.R., and possibly other lines, running rights over the line into Halifax, and is taking up the question of building a second track from Moncton to Halifax, in connection with the proposal.

St. John, N.B—D. McNicoll, Vice President, returned to Montreal April 9, from a trip of inspection to St. John, and is reported to have referred to the necessity of the Dominion Government pushing forward with the development of the harbor works on the west side. The company's line between St. John and Montreal was capable of handling double the present traffic, if there were sufficient handling facilities at St. John. As soon as the Dominion Government had built the new sea wall the company would start building a 1,000,000 bush. elevator. It was hoped to have this ready for the opening of the winter traffic in 1913. The extension of the freight yards would also be gone on with when the Government works had been sufficiently advanced.

Improvements between Granby and Farnnam, Que.—Press reports state that G. H. Gardner, one of the company's engineers, has opened an office at Granby, Que., and is arranging for making surveys between that place and Farnham.

Orford Mountain Ry.—The Quebec Legislature has granted 2,000 acres of land a mile for 22 miles of railway, viz., from Bolton to Mansonville, from Mansonville to the international boundary, from Windsor Mills to Bronson Falls, and for 3.5 miles from Melbourne, Que.

Quebec Station Building, Etc.—The mayor of Quebec has received plans showing the lay out of the proposed new station and terminal facilities in Quebec. The company proposes to straighten its line and rearrange its yard, for which purpose it desires to expropriate a large section of Victoria Park, and to divert the St. Charles River, making certain exchanges of property with the city. Freight sheds would be built near St. Paul street, and the new passenger station would be built at the Palais. The plans are being considered by the city council.

Cap de la Madeleine Ry.—The Dominion Parliament has declared the C. de la M. Ry. to be a work for the general advantage of Canada, and has authorized its amalgamation with the C.P.R. under agreement, the head offices being moved to Montreal.

Northern Colonization Ry.—The Quebec Legislature has granted 3,000 acres of land a mile for the building of 100 miles of line from Mont Laurier, the present terminus of the Northern Colonization Ry., towards Lac des Quinze.

Ottawa Northern and Western Ry—The Dominion Parliament has extended the time for the building of various branch lines authorized to be built.

Ottawa Tunnel Proposals.—It is said that the Government has promised an early consideration of the company's plans for a tunnel in Ottawa, and that the Minister of Railways has personally approved of the general proposal, though he has not given any definite approval of the plans.

Campbellford, Lake Ontario and Western Ry.—The Board of Railway Commisioners has approved of location plans of the line from mileage 15 to 58.5. The revised location plans for the entry of the line into Belleville show that it will go in parallel to, but north of the Canadian Northern Ontario Ry. In West Belleville and Sidney tp. it is proposed to expropriate part of the C.N.O. Ry. and to rebuild that line a little further south. G. A. Mountain, Chief Engineer, Board of Railway Commissioners, is going over the route with a view to reporting upon a number of proposed revisions, and a local report states that an arrangement may be made between the two companies by which a common right of way will be used through Belleville.

It was reported April 17, that about 800 men had started work on the line. W. H. McGann, of the company's engineering staff, has taken up his headquarters at Belleville.

Kingston and Pembroke Ry—Press reports state that 3,000 tons of new steel rails will be laid on this line during the current year, that several bridges will be rebuilt, and a lot of ballasting and considerable other betterment work done. The estimated expenditure is $205,000.

Georgian Bay and Seaboard Ry.—A meeting of shareholders has been called to be held at Toronto, May 9, to authorize the issue of additional bonds or other securities for the completion of the line from Victoria Harbor to Bethany Jct., Ont.

Leaside Jct., Ont., Developments.—The company is reported to have acquired over 1,000 acres of land at Leaside Jct., Ont., just east of Toronto, upon which it is said will be laid out freight yards and terminals similar to those at West Toronto. It is further said that this work will be done as part of the plans for the improvement of the company's facilities in and near Toronto, and in preparation for the completion of the Campbellford, Lake Ontario and Western Ry.

Union Station for North Toronto.—It is said that plans are being prepared for the building in conjunction with the Canadian Northern Ontario Ry., of a union station on the east side of Yonge street, in the north part of the city. It is proposed to have six tracks entering the station, which will be reached by stairs, from the street level.

Lambton to Brampton, Ont.—Press reports state that the company has engineers in the field locating a line from Lambton to Brampton, Ont. In this connection it may be noted that some of the company's engineers have been making a survey for a line from the South Ontario Pacific Ry. through Acton to Georgetown.

South Ontario Pacific Ry.—Work has been started on the ballasting and other finishing work on the Guelph Jct.-Hamilton line.

Surveys are reported to have been made for an extension through Acton to Georgetown, Ont.

Galt, Ont.—It is reported that the company has purchased four acres in Galt, Ont., and will expend $100,000 in laying out a down town freight terminal. The plans, it is said, provide for the laying of seven tracks, and the building of a 290 ft. freight shed, abutting on the east end of Main street.

Tillsonburg, Lake Erie and Pacific Ry—The Dominion Parliament has voted subsidies in aid of the biulding of a line from Ingersoll to Stratford, or to near Berlin, Ont., 35 miles; in lieu of the subsidy voted in 1907.

Spur Track at St. Marys.—Press reports state that a spur line of about three-quarters of a mile is to be built to the cement works at St. Marys.

London Improvements.—Negotiations are reported to be in progress with the London city council, for the carrying of the company's line across the G.T.R. east of the city, down into the manufacturing district in the east end, and making a connection with the London and Port Stanley Ry.

Chatham, Ont.—Press reports state that a considerable expenditure is to be made upon the station, and the yards, during the current year. The other works proposed to be undertaken, it is stated, are the building of a spur line to connect with the Pere Marquette Rd., and the reconstruction of a bridge over the Thames, east of the city.

West Ontario Pacific Ry.—The Dominion Parliament has extended the time within which the company may build its projected line from near Sarnia to Lake Erie, with branches to Ingersoll and Woodstock, Ont. The company was originally incorporated in 1885.

New Buildings at Windsor, Ont.—Local press reports state that some extension is to be made to the company's yards at Windsor, and that a new freight shed, 500 x 30 ft. wide, will be built.

Fort William Elevators.—The mayor stated, April 3, that he had received notice from the C.P.R. that it was proposed to build a 1,000,000 bush. cleaning elevator at Fort William, Ont., and that work would be started at once in order to have it ready in time to handle this year's crop.

Proposed Yards at Springfield, Man—Winnipeg press reports state that the plans for the proposed new yards at Springfield, on the east side of Winnipeg, provide for the final covering of an area of 2.5 miles by half a mile, and that altogether 100 miles of track will be laid. The buildings will include freight shed, round house, machine shop, and a large terminal grain elevator. Negotiations with the Springfield municipal council for the closing of roads, etc., have been started, and it is expected to have everything ready so that work may be commenced on the laying out of the yards in the fall.

Red River Bridge, Winnipeg.—We are officially advised that a contract has been let to the Foundation Co., Montreal, for putting in the substructure of a bridge across the Red River at Winnipeg. The bridge is situated about half a mile east of the station. The substructure will consist of concrete foundations, with five piers and two abutments of masonry. The Dominion Bridge Co. will build the superstructure, which will consist of four 130 ft. through double track truss spans, and one 260 ft. through double track swing span. The dimensions from centre line to centre line of the trusses will be 32 feet. The swing span will be operated either by a gasoline engine or electric power. The total length of the bridge from face to face of ballast walls will be 770 ft.

Gimli Branch Extension.—We are officially advised that it is probable the extension of the Gimli branch from the present track end to Riverton, on the Icelandic River, Man., will be proceeded with, but nothing definite has yet been decided.

The Dominion Parliament has voted a subsidy in aid of the building of this branch line from near Teulon to the Icelandic River, 35 miles, in lieu of that voted in 1906.

Manitoba and North Western Ry.—The Dominion Parliament has voted a subsidy in aid of the building of a line from Hamiota to Birtle, Man., about 30 miles.

Regina Terminals.—The President of the Regina Board of Trade stated at a meeting, April 12, that he had been advised by the company's officials in Winnipeg, that it was intended to double its facilities in Regina during this year.

Moose Jaw Southwesterly.—The Board of Railway Commissioners has approved revised location plans for the branch from Moose Jaw, Sask., southwesterly, 35.59 miles, and location plans from mileage 35.59 to 37.85. The branch has been opened for traffic for 27.4 miles, and the remainder of the mileage is under construction.

Wilkie-Anglia Branch.—The Board of Railway Commissioners has approved of revised location plans of the Wilkie-Anglia branch, from the Pheasant Hills branch, in sec. 6, tp. 40, range 19, for 35.34 miles, to sec. 22, tp. 34, range 19, west of the third meridian, Sask.

Bridge at Outlook, Sask.—A subsidy of 15 per cent. of the cost of the bridge across the Saskatchewan River at Outlook, Sask., has been voted by the Dominion Parliament, but the total amount payable is not to exceed $115,000.

Weyburn-Lethbridge Branch.—General Superintendent Scully was at Weyburn, Sask., April 11, and informed the Board of Trade that arrangements were being made for improving the company's facilities there. It is proposed to put in a spur line at Forward, Sask., to connect with the Canadian Northern Ry. The construction of the line westerly from the present track end at Viceroy, Sask., is being proceeded with.

At the western end of the line, the Board of Railway Commissioners has approved of the route for 36 miles due east from Sterling, Alta., the point of junction with the Alberta Ry. and Irrigation Co.'s line. The contract, let to J. Timothy, Edmonton, calls for the grading of 25 miles, but General Superintendent Price is reported as having stated that the 36 miles, for which the route plans have been approved, will be graded this year.

Department of Natural Resources.—Tenders are being received to May 1, for concrete construction, etc., on about half the area comprised in the eastern section of the company's irrigation block, Alta. The approximate quantities are 15,000 cubic yards of concrete and 1,200,000 lbs. of reinforcing steel. The quantities in individual structures vary from five cubic yards to 700 cubic yards of concrete, with a proportionate weight of steel.

Ogden Shops, Calgary.—Work on the new shops at Calgary, Alta., which are to be named after I. G. Ogden, Vice-President, is being progressed with. Large quantities of material have been delivered, and several gangs of men are at work clearing the site, getting the foundations prepared for the buildings, and grading for the tracks.

Lacombe Branch.—The Board of Railway Commissioners has approved revised location plans for the extension of this branch, easterly from mileage 100.07 to 146.10.

Overhead Bridge, Strathcona.—Tenders are under consideration for the placing of concrete for an overhead bridge at Anthony St., Strathcona, Alta.

Office Building at Edmonton.—A permit has been issued for the erection of an office building on Jasper Ave., to cost $350,000. The contractors are C. H. Sharp and Son, Winnipeg, Man. The clearing of the site was started April 2, and it is expected to have the new building completed by Feb., 1913.

Frank, Alta.—The condition of the mountain at Frank is again causing some anxiety, and it is reported that surveys are being made for the diversion of the C.P.R. from near Cowley to Blairmore, so as to have the line beyond the danger zone.

Alberta Central Ry.—We are officially advised that it is intended to complete the line from Red Deer to Rocky Mountain House, Alta., this year. D. F. McArthur, Winnipeg, is the contractor. J. G. McGregor is chief engineer of the A.C. Ry., reporting to W. A. James, C.P.R. Division Engineer of Construction at Winnipeg.

Second Track Work in B.C.—F. F. Busteed, who has been placed in charge of the second track construction west of Calgary, Alta., has opened an office in Kamloops, B.C., and is arranging for the surveys preparatory to starting work.

Laggan to Lake Louise.—In consequence of the great increase in travel to the summer hotel at Lake Louise, B.C., a line 3½ ft. gauge is being built from Laggan, on the main transcontinental line, to Lake Louise, 3.5 miles. It will have a maximum gradient of 4 per cent. The contractors are Grant Smith and MacDonnell. Four gasoline motor cars, two with capacity for 35 passengers each, and two with capacity for five tons of baggage each, are being built at the Angus shops. Hitherto the transfer between Laggan Station and Lake Louise Hotel has been performed by busses and wagons.

Proctor, B.C.—Ties and rails have been delivered at Proctor, B.C., for the construction of a spur line from the wharf to the hotel. The grading is being gone on with.

Rossland Branch Electrification.—This is dealt with in a separate article in the electric railway department further on in this issue.

Kootenay Central Ry.—In place of the subsidies voted in 1910, the Dominion Parliament has granted aid towards the building of this line as follows:—From Golden, via Windermere and Fort Steele to near Jackson, on the British Columbia Southern Ry., not exceeding 175 miles; and from near Caithness on the B.C.S. Ry., towards the international boundary, not to exceed 25 miles.

The Board of Railway Commissioners has authorized the opening for freight traffic of the line from Colvalli to Bull River, 9.2 miles.

Tunnel in Vancouver.—We are officially advised that while General Superintendent Oborne has not had any conference with the Vancouver city council about the construction of a tunnel to connect the company's main line with its False Creek yards, a proposition to this end has been brought up at the council meetings. The object in view by those suggesting the tunnel is to avoid some grade crossings at Hastings and Powell streets. The company has not prepared any plans.

Buildings in Vancouver and Victoria.—A permit has been taken out for the building of a six-story reinforced concrete power house and laundry building at the rear of the company's hotel in Vancouver, to cost about $120,000.

It is said that plans are being prepared for the erection of an office building for the C.P.R. coast steamship service in Victoria. (April, page 176.)

Frog and Switch Repair Cars.—Both the Southern Pacific and Frisco Lines appear to be meeting with considerable success in the use of frog and switch repair cars, which travel over the system, stopping at previously advised points, where in conjunction with the section foreman, the track is carefully gone over and repaired. The track tools are at the same time put in condition. A big saving results, not only in eliminating the cost of shipment to the nearest shop, but the track foremen co-operate to a greater degree in keeping the track material under their charge more carefully inspected in anticipation of the visit of the repair car.

Canadian Northern Railway Earnings, Expenses, Etc.

Gross earnings, working expenses, net profits, increases or decreases, compared with those for 1910-11, from July 1, 1911:—

	Earnings.	Expenses.	Net Earnings.	Net Increase
July	$1,475,900	$1,114,300	$361,600	$13,400
Aug.	1,420,600	1,105,900	314,700	51,700
Sept.	1,576,400	1,157,000	419,400	38,200
Oct.	2,028,900	1,348,600	680,400	99,900
Nov.	2,001,500	1,336,300	665,200	106,300
Dec.	1,831,400	1,327,600	503,800	141,600
Jan.	1,223,100	1,004,400	223,706	122,000
Feb.	1,203,400	965,800	237,600	101,800
	$12,766,200	$9,359,800	$3,406,400	$677,900
Inc.	$ 3,093,900	$2,416,000	$ 677,900	.....

Approximate earnings for March, $1,572,700, against $1,270,600 for March, 1911.

Canadian Pacific Railway Earnings, Expenses, Etc.

Gross earnings, working expenses, net profits, increases or decreases, compared with those for 1910-11, from July 1, 1911:

	Earnings.	Expenses.	Net Profits.	Net Increases.
July	$ 9,661,818.14	$5,958,789.81	$3,703,028.33	$218,408.74
Aug.	10,421,904.42	6,346,333.41	4,075,571.01	383,698.68
Sept.	10,049,084.97	6,131,638.17	3,917,446.80	5,847.16
Oct.	11,207,991.99	6,526,887.24	4,681,104.75	175,944.23
Nov.	10,570,694.80	6,583,328.31	3,987,366.46	250,244.23
Dec.	10,654,871.67	6,549,141.41	4,105,730.26	819,196.37
Jan.	7,328,781.81	6,245,924.11	1,082,857.70	426,789.83
Feb.	8,951,907.20	6,048,040.53	2,338,866.67	1,239,159.16
	$78,827,055.00	$50,890,082.99	$27,936,972.01	$3,519,438.40
Inc.	11,923,919.45	$7,404,181.05	$ 3,519,438.40	.....

Approximate earnings for March $10,389,000 against $8,648,000 for March, 1911.

Grand Trunk Railway Earnings, Expenses.

Following are the earnings of the G.T.R., C.A.R., G.T. Western Ry., and D.G.H. and M. Ry., for Feb., as compared with those for Feb., 1911:—

GRAND TRUNK RAILWAY.

	1912.	1911.
Earnings	$2,506,400	$2,326,800
Expenses	2,147,100	1,995,700
Net earnings	$ 359,300	$ 331,100

CANADA ATLANTIC RAILWAY.

	1912.	1911.
Earnings	$ 128,800	$ 121,000
Expenses	155,900	133,900
Deficit	$ 25,200	$ 12,300

GRAND TRUNK WESTERN RY.

	1912.	1911.
Earnings	$ 476,000	$ 497,600
Expenses	460,400	415,400
Net earnings	$ 15,600	$ 82,200

DETROIT, GRAND HAVEN AND MILWAUKEE RY.

	1912.	1911.
Earnings	$ 147,700	$ 157,100
Expenses	186,000	160,000
Deficit	$ 38,300	$ 2,900

Approximate earnings for March, $4,080 230, against for $3,909,773 for March, 1911.

TRAFFIC RECEIPTS OF THE SYSTEM.

	1912.	1911.	Inc.	Dec.
G.T.R.	$8,298,539	$7,861,390	$437,149	.....
C.A.R.	459,450	447,256	12,194	.....
G.T.W.R.	1,536,894	1,602,980	.....	$66,086
D.G.H.&M.R.	474,947	489,669	.....	14,722
Totals	$10,769,830	$10,401,295	$368,535	

Railway Taxation in Manitoba.—An act has been passed by the Manitoba Legislature, adding the following words after "place" in line 8, sec. 19, chap. 166, of 1902: "Or of levying on all real property, the property of a railway company, its share or proportion of taxation levied and imposed under or pursuant to the provisions of the Land Drainage Act." The second section of the act makes it apply to all drainage districts already formed, or which may be formed during the continuance of the Land Drainage Act.

The Death of Charles M. Hays.

Charles Melville Hays, President, G.T.R. and G.T. Pacific Ry., who was lost in the Titanic disaster, April 15, was born at Rock Island, Ill., May 16, 1856. He entered railway service in 1873, since when he has been, to 1877, clerk Atlantic and Pacific Rd. (now part of the Frisco Lines), St. Louis, Mo.; 1877 to 1844, secretary to Vice President and General Manager, Wabash and Missouri Pacific systems; 1884 to 1886, secretary to Vice President and General Manager, Wabash, St. Louis and Pacific Rd.; 1886 to 1887, Assistant General Manager same road; 1887, appointed General Manager, Wabash Western lines, comprising all the lines west of the Mississippi River and that portion of the lines east, between Chicago and Detroit, and on the consolidation of the Wabash lines, he was appointed General Manager of the entire system. In 1894 he was elected also Vice President, and resigned Dec. 31, 1895, on his appointment as General Manager, G.T.R., which position he resigned in 1901 to become President, Southern Pacific Rd., but on that railway changing hands after a few months he returned to the G.T.R. as General Manager, and was also elected Second Vice President in 1902. On Jan. 1, 1910, he was elected President. He was also President, G.T. Pacific Ry., from Aug. 10, 1904.

Mr. and Mrs. Hays left Montreal Feb. 12, and sailed from New York for England Feb. 16. They were preceded by Thornton and Mrs. Davidson, their son-in-law and daughter, who travelled in Europe before joining Mr. and Mrs. Hays for the return journey. Of the family party Messrs. Hays and Davidson were drowned, Mrs. Hays and Mrs. Davidson being rescued. Vivian Payne, Mr. Hays' private secretary, was also lost.

The arrival of the s.s. Carpathia in New York, April 18, with the survivors from the Titanic was awaited by H. G. Kelley, Vice President, G.T.R.; E. H. Fitzhugh, President, Central Vermont Ry.; Dr. J. A. Hutchison, Chief Medical Officer, G.T.R., who is also the Hays' family physician; and Hope and Mrs. Scott, Mrs. Hays' son-in-law and daughter, and by W. H. Gregg, of St. Louis, Mrs. Hays' father, and some other relatives. The party was taken as quickly as possible after the boat docked to the Grand Central Station, where they boarded a special train to Montreal, arriving there the following morning.

Shortly after Mrs. Hays' return to Montreal, H. G. Kelley, Vice President, G.T.R., gave a statement to the press, in which he said that Mrs. Hays and her daughter, Mrs. Davidson, had retired to their cabins, but had not undressed when the crash came. Mr. Hays and Mr. Davidson were on deck, with H. Markland Molson. Shortly after the Titanic ran into the iceberg, the ladies were brought on deck, and Mr. Hays and his son-in-law went back to the cabins to get fur coats for them, as the night was very cold. All imagined that there was no immediate danger, and in spite of the fact that some of the lifeboats were being lowered and the passengers being loaded into them, it was thought to be the best course to pursue to remain with the ship. As the second last lifeboat was swung over the steamer's side, Mr. Hays informed his wife and daughter that he thought it advisable that they get into this, saying that he and Mr. Davidson would wait until help came in the morning. The men then wrapped the two ladies in their warm coats, and with Mrs. Hays' maid helped them into the boat. The last seen of Messrs. Hays, Davidson and Molson, they were standing on the deck, waving to the ladies in the boat, and as a further assurance, Mr. Hays called out that the Titanic was good for ten hours more, and by that time help would have surely arrived. The lights of the liner went out shortly after the smaller lifeboat pulled some distance away, but neither of the ladies saw her sink below the surface. Naturally, both were greatly agitated, and although anxious for their husbands, did not consider them in any imminent danger. The women were huddled together in the bottom of the boat, and did not suffer any hardships from the exposure. It was not until the next day that Mrs. Hays and her daughter were definitely aware of the loss of their husbands.

Col. Gracie, of the U.S. Army, who had a most remarkable escape, having stayed on the ship till the last, is reported to have said:—"Before I retired I had a long chat with Mr. Hays. One of the last things he said was this: 'The Hamburg-American lines are devoting their attention and ingenuity to vying with one another to attain the supremacy in luxurious ships and in making speed records. The time will come soon when this will be checked by some appalling disaster.' Poor fellow, a few hours later he was dead."

Major Peuchen, of Toronto, who was saved, in testifying before the U.S. Senate committee at Washington, D.C., April 23,

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described feeling the shock of the collision and going on deck, where a friend told him an iceberg had been struck. He continued:— "After a few minutes I went to other friends and said it was not serious. Fifteen minutes later I met C. M. Hays. I asked him: 'Have you seen the ice?' He said 'No.' Then I took him up and showed him. Then I noticed the boat was listing. I said to Mr. Hays: 'She's listing; she shouldn't do that.' He said: 'Oh, I don't know. This boat can't sink.' He had a good deal of confidence, and said: 'No matter what we have struck she's good for eight or ten hours.'"

A memorial service for Mr. Hays was held on April 25 in the American Presbyterian Church, Montreal, of which he was a member. At 11.30 a.m., Montreal time, all trains, yard engines, vessels, telegraph and telephone services over the entire system were stopped for five minutes, and all labor was similarly suspended. The principal stations and offices were draped in black and purple, and all the companies' flags were lowered to half mast.

Joliette and Lake Manuan Colonization Ry.

A company with this title was incorporated by the Dominion Parliament in 1903 to build a railway from Joliette northerly to St. Emelie de l'Energie, thence northerly and northwesterly to St. Michel des Saints, and thence to Lake Manuan, Que. Subsequently cash and land subsidies were voted by the Dominion Parliament and the Quebec Legislature, respectively, and acts extending the time for construction were passed in 1905 and 1909. Up to 1910 nothing had been done, but in that year a change was made in the control of the company, and arrangement effected for British capital to build the line. J. N. Patton was appointed Chief Engineer, a contract was let to the Enterprise Construction Co., and some grading was done. In 1911 a further extension of time for construction was granted, and power was given for the extension of the line southerly through Montcalm, L'Assomption and Hochelaga counties to Montreal. The Dominion subsidy for the line from Joliette to Lake Manuan, about 60 miles, is still available, and the Quebec Legislature has re-granted the old land grant subsidy for the same mileage at the rate of 4,000 acres a mile. This subsidy covers about half the distance to the National Transcontinental Railway, and the Government has pledged itself to provide a land subsidy for the balance of the line to the N.T. Ry., as well as for the extension southerly into Montreal, a total mileage of 120, or 180 miles from Montreal to the N.T.R.

The principal nominal officers of the company are:—Hon. A. N. Belcourt, Ottawa, President; and J. R. Ritchie, K.C., Vice President. A. M. Laredo, of London, Eng., who has been in Canada for two years in connection with the company, has acquired a three-fourths interest in the charter, and is also interested in the British Canadian Construction Co., which has been formed to carry out the general construction and equipment contract. H. S. Ross, K.C., Montreal, is President of this company. The contract for the construction of the 60 miles from Joliette to St. Emelie de l'Energie has been let to the Enterprise Construction Co., with which are associated W. J. Sims, 48 Spark St., Ottawa, and I. A. Hodge, of Syracuse, N.Y. It is expected to have this graded and ready for the steel this year, and the track will be laid with 80 lb. steel this year if it can be obtained. The company's Chief Engineer is J. M. Paton, and H. S. Dickson is Resident Engineer, both with headquarters at St. Felix de Valois, Que. The company is arranging to make an issue of bonds in London, Eng., and Paris, France.

Mr. Laredo is also one of the principal promoters of the Ottawa, Abitibi and Hudson Bay Ry., which was incorporated at the recent session of the Quebec Legislature, to build a line from Hull, through Wright and Pontiac counties, and the Coulonge River Valley via Great Lake Victoria, to the National Transcontinental Railway, and on past Lake Metagami to James Bay. (Feb., pg. 68.)

C.P.R. Oil Burning Locomotives—The C.P.R. is changing a large number of locomotives to burn oil than was at first intended. On the British Columbia division 76 will be changed, and 14 on the Esquimalt and Nanaimo Ry. even Seven stationary plants on the B.C. division, for pumping stations at oil storage plants, will also be equipped fro oil burning. A storage tank of 43,000 barrels capacity is being built at Esquimalt, B.C., to provide an auxiliary supply for the company's B.C. coast steamship service, and this will be used to supply the E. and N Ry. locomotives, for a time at least.

Canadian Northern Railway Construction, Betterments, Etc.

Quebec and Lake St. John Ry.—The Quebec Legislature has granted 3,000 acres of land per mile for the following lines:—From Valcartier to St. Catherine, a 4½ mile branch from Valcartier towards Gosford, and to extend a branch line 12 miles to Valcartier.

St. Charles and Huron River Ry—The Dominion Parliament has voted a subsidy for the building of a line from Indian Lorette on the Quebec and Lake St. John Ry., along the valley of the St. Charles River to Stoneham, 7.5 miles. The Quebec Legislature has granted 2,000 acres of land a mile for the same line.

James Bay and Eastern Ry.—The Quebec Legislature has voted 4,000 acres of land a mile for the 30 miles of this line from Roberval, westerly towards James Bay, now under construction.

Canadian Northern Quebec Ry.—W. A. Kingsland, Auditor C.N.Q. Ry., is reported as having stated in Quebec, April 11, that the work of laying out tracks and building the shops at Limoilou, Quebec city, will be re-started May 1, and pushed to completion, and that when the Canadian Northern transcontinental line was completed the terminals at Cap Rouge, where the company has a mile of river frontage for development, will be arranged. A complete description of the Limoilou shops appears on another page.

A subsidy has been voted by the Dominion Parliament in aid of the building of a line from near Arendal to Preston and Hartwell tps., not exceeding 30 miles.

Subsidies have been voted by the Quebec Legislature as follows:—To the Great Northern Ry., one of the C.N.Q.R. constituent companies, 2,000 acres of land a mile for a line from St. Sauveur to St. Jerome, 15 miles; and to the C.N.Q. Ry. 3,000 acres a mile for 16 miles of line in Montcalm county; 2,000 acres a mile for 65 miles from near Montreal to a junction with the C.N.Q. Ry. near Grenville; 2,000 acres a mile for 82 miles from Quebec to Garneau Jct., with a five mile branch to the Quebec bridge, and a 7½ mile line from Limoilou to the Montmorency river.

Canadian Northern Montreal Tunnel and Terminal Co.—In a recent interview Sir Wm. Mackenzie is reported to have stated that the company's act of incorporation having been passed, a start would be made on the tunnel and connecting lines immediately. The contract with the C.N.R. calls for the completion of the tunnel before the end of 1913.

S. P. Brown, Chief Engineer of the tunnel construction, who is located in Montreal, and is working on the final plans, is reported as having stated that the tunnel will be a double track one, with a diaphragm wall between the two tracks. It will be about three miles long, but it is not expected that it will present any serious engineering difficulties. The geological formation promises good conditions, and although the rock will vary considerably, water is the only difficulty which may be expected. The tunnel will be lined with concrete, the thickness of which will vary as conditions require. Work is expected to be started May 1 at both ends of the tunnel, and it is hoped to complete the tunnel in less than the 500 days estimated.

Ottawa Car Shops.—Sir Wm. Mackenzie, President, is reported as having stated at Ottawa, April 3, that car shops will be built on the site acquired near Ottawa, but he would not say that they would be the company's central car shops.

Ontario and Ottawa Ry.—The Dominion Parliament has extended the time for the building of a line from near Lake Couchiching to Snowden tp., and from Herschell tp. easterly to Renfrew, thence across the Ottawa River to Hull, and recrossing the Ottawa River to Ottaw

Toronto to Hamilton, Niagara, etc.—A large area of land is reported to have been acquired by the company at Leaside Jct., near Toronto, close to that purchased by the C.P.R. for terminal yards, etc.

Plans are said to be in preparation for the building of a union station in North Toronto, for joint use with the C.P.R.

At Hamilton considerable time has been spent in discussing the company's plans for its line in the city. The city council has engaged F. L. Sommerville, formerly District Engineer, G.T.R., Toronto, to advise as to the plans.

Col. Davidson, of the company's land department, and other officers of the company have been in London and other places in Western Ontario during the past month, making enquiries in connection with traffic, etc.

Orillia to Sturgeon Point, Ont.—Press reports state that engineers are locating a line from the C.N.R. just outside Orillia, to Sturgeon Point, Georgian Bay.

Montreal-Ottawa-Port Arthur Line.—The Board of Railway Commissioners has approved of location and revised location plans as follows:—For 0.60 of a mile in Litchfield tp. at mileage 59 from Ottawa; for 1.12 miles at mileage 339.5 in Ferris tp.; through Maclennan, Scadding, Street and Davis tps., mileage 405.36 to 421.09 from Montreal; from mileage 270.9 to 272.83 and from mileage 343.15 to 363, from Sudbury Jct.

The Board has also authorized the building of a transfer track to connect the Sudbury branch with the Algoma Eastern Ry. in Sudbury; and the making of a connection with the C.P.R. at mileage two from Port Arthur, for construction purposes only.

The plan and book of reference of location of the line through the city of Port Arthur and McGregor tp., mileage 2 to 6.49. have been deposited in the Port Arthur Registry Office.

Canadian Northern Ry—The Dominion Parliament has extended the time for the building of a number of branch lines authorized to be constructed in 1908 and 1910, and has approved of the building of various lines authorized by the Saskatchewan Legislature to be built by the Saskatchewan Midland Ry., the Saskatchewan North Western Ry., and by the Alberta Legislature under the charter of the Alberta Midland Ry.

M. H. MacLeod, General Manager, stated recently at Port Arthur that the company was planning to secure a second track between that city and Winnipeg, and that engineers were engaged in making the necessary surveys.

The Manitoba Government has guaranteed the principal and interest of the company's bonds for $13,000 a mile for a line from the present terminal of the line authorized to be built by par 2 in the schedule attached to chap. 57 of the statutes of 1909 for 150 miles northerly to tp. 44. This line is to start at Winnipeg and is intended to connect with the line being built by the Dominion Government from Le Pas to Hudson Bay.

The President of the Regina Board of Trade stated at a meeting, April 12, that M. H. MacLeod, General Manager, has informed him that the company has under consideration the building of a line from Regina, to join the Gorse Lake line at either Rosetown or Kindersley, in place of the previously projected line from Chamberlin to Kindersley, and that it is possible that some grading will be done on this line during the current year.

The question of the building of a transfer railway in Saskatoon is being considered, and the local men who hold the Saskatoon Transfer Ry. charter are negotiating with the C.N.R. with a view to that company building the line.

Sir Wm. Mackenzie is reported as having informed some Prince Albert, Sask., people, Mar. 25, at Ottawa, that 50 miles of the line from Prince Albert towards a junction with the Government line to Hudson Bay at Le Pas will be built this year. M. H. MacLeod, General Manager, stated subsequently that the surveys will be made at an early date, and grading gangs will follow the survey parties. A later press report stated that W. Ozeman, Kinistino, Sask., had been given a contract for the work, but we were advised by him, April 16, that this was incorrect.

We are officially advised that a contract on the Prince Albert Battleford Branch, for 34 miles west of Blaine Lake, has been let to W. J. Cowan, Winnipeg.

An office has been opened in Moose Jaw, Sask., with Engineer Thomas in charge. Grading has been completed to 15 miles south of the town and work on a big trestle four miles out has been started. The clearing of the area secured for terminals in Moose Jaw is expected to be completed by May 15.

The Board of Railway Commissioners has approved of revised location plans for the Swift Current branch from mileage 78.29 to 124.96 in Saskatchewan.

Arrangements have been made with the G.T. Pacific Ry. for the erection of a union station in Edmonton. The present C.N.R. station will be used as the basis of the new station.

Press reports state that location surveys have been completed for a line southeasterly from Camrose, Alta., and that construction is expected to be started at an early date.

A contract has been let to the Northern Construction Co. for the building of the remaining four miles of the short line from the Brazeau line to Red Deer.

The Board of Railway Commissioners has approved of location plans for the Strathcona-Calgary line through Strathcona and the adjoining tp.; from mileage 0 to 4.55 and from mileage 65.05 to 102.50.

The James O'Connor Construction Co. has had 250 teams, with the necessary gangs of men, shipped to Macleod for the grading of the line from that place to Pincher Creek. The work is reported let to seven subcontractors, who expect to have the grading completed within three months.

The Dominion Parliament has passed two acts relative to aiding the construction of the Canadian Northern Alberta Ry. The first recites that by the act of 1910, certain aid was to be given by guaranteeing bonds towards the building of 150 miles of line, and provides that such aid may be applied to the 150 miles of line from St. Albert towards the Yellowhead Pass, and the second provides for the guaranteeing of bonds for $25,000 a mile, for the extension of the line from mileage 150 from St. Albert, to the boundary of British Columbia at the Yellowhead Pass, not exceeding 115 miles.

The Board of Railway Commissioners has approved location plans for the main line from mileage 166.01 to 192.83, and has authorized the occupying of a portion of the G.T. Pacific right of way, from mileage 192.83 to 222.79.

Canadian Northern Pacific Ry.—The Dominion Parliament has granted $12.080 a mile towards the building of a line from Yellowhead Pass to the mouth of Fraser River, about 525 miles.

In a recent interview M. H. MacLeod, General Manager, stated that the contracts for the whole of the line from the Yellowhead Pass to the mouth of the Fraser River had been let. An announcement was recently made that the

contractors for the section from Kamloops to the Yellowhead Pass, expected to put the last 120 miles of the section in the hands of subcontractors at an early date.

We are officially advised that the company's engineers have secured a route through the Yellowhead Pass which will give a lower gradient than that of the G.T. Pacific Ry. On the Alberta side the maximum gradient will be 0.5 deg. and on the Pacific side 0.7 deg.

Vancouver Island—It is reported that tenders will be asked at an early date for grading, etc., on a further mileage on the line on Vancouver island. It is expected that the section will carry the line to Comox at the north of the island. Press reports state that the company has acquired 1,480 acres of land in the vicinity of Duncan Bay, about three miles south of Seymour Narrows. (April, pg. 178.)

Railway Rolling Stock Notes.

The G.T.R. is reported to be in the market for six tourist cars and 15 colonist cars.

The Quebec Central Ry. has received two mogul locomotives from the Canadian Locomotive Co.

The Temiskaming and Northern Ontario Ry. is in the market for four steel underframe cabooses.

The Algoma Central and Hudson Bay Ry. has received four 10-wheel locomotives from the Canadian Locomotive Co.

The Reid Newfoundland Co. has ordered the construction of a rotary snow plough and two locomotives at its shops at St. John's.

The Intercolonial Ry. has received four switching and five consolidation locomotives from the Canadian Locomotive Co.

The Temiskaming and Northern Ontario Ry. has ordered four steel underframe vans from the Canadian Car and Foundry Co.

The Joliette and Lake Manuan Ry., in which A. M. Laredo, Windsor Hotel, Montreal, is principally interested, will probably be in the market for rolling stock about August.

The C.P.R. is building at its Angus shops four gasoline motor cars, two with capacity for 35 passengers each, and two with capacity for five tons of baggage each, to run on the line which is being built between the main line at Laggan, Alta., and Lake Louise, 3.5 miles, which will be 3½ ft. gauge.

O'Brien, McDougall and O'Gorman, railway contractors, have ordered one Rodger double plough distributing car from the Hart-Otis Car Co. Following are the chief dimensions:—

Capacity	30 tons
Length over end sills	32 ft.
Width over side sills	8 ft. 9 ins.
Height from rail to floor	4 ft. 1¼ ins.
Truck centres	23 ft. 8 ins.
Wheel base of truck	5 ft. 2 ins.

Following are the chief details of the two sleeping cars and one dining car, which the Intercolonial Ry. is having built by the Canadian Car and Foundry Co.:—

Length over end sills	72 ft. 3 ins.
Width over side sills	9 ft. 10 ins.
Width between deck sills	5 ft. 6 ins.
Height from rail to top of roof boards	14 ft. 2 ins.
Height from rail to centre of coupler	2 ft. 11 ins.
Underframe	Steel
Lighting	Pintsch gas and electric

Roberts Bros. and Co., railway contractors, Chicago, Ill., who have a contract on the Canadian Northern Ry., have ordered one Rodger double plough distributing car from the Hart-Otis Car Co. Following are the chief dimensions:—

Capacity	30 tons
Length over end sills	32 ft.
Width over side sills	8 ft. 9 ins.
Height from rail to floor	4 ft. 1¼ ins.
Truck centres	23 ft. 8 ins.
Wheel base of truck	5 ft. 2 ins.

The C.P.R., between Mar. 14 and Apr. 16, received the following additions to rolling stock:—154 wooden box cars, two tourist cars, 13 first class cars, 13 baggage and express cars, and 11 G2 locomotives, from its Angus shops, Montreal; 423 steel frame box cars from the Canadian Car and Foundry Co.; two ballast spreaders from F. H. Hopkins and Co.; 343 steel frame box cars from the American Car and Foundry Co.; 309 steel frame box cars from the Western Steel Car and Foundry Co.; two Bucyrus steam shovels and two wrecking cranes.

Following are chief details of the 50 Otis steel dump cars which the Intercolonial Ry. has ordered from the Hart-Otis Car Co., and which will be built by the Canadian Car and Foundry Co.:—

Length over end sills	38 ft. 9 ins.
Length inside	36 ft. 9¼ ins.
Width over all	9 ft. 11¼ ins.
Width inside	9 ft. 6 ins.
Height inside	5 ft.
Height from rail to top	9 ft. 4 13-16 ins.
Height from rail to floor	4 ft. 4 13-16 ins.
Truck centres	26 ft.
Wheel base of truck	5 ft. 6 ins.
Wheel base of car	31 ft. 6 ins.
Number of doors on each side	Six
Width of door opening	2 ft. 2 ins.

Following are the chief dimensions of the 20 Otis semi-composite ore caars, which the C.P.R. has ordered from the Hart-Otis Car Co.:—

Capacity	50 tons
Length over end sills	25 ft. 9 ins.
Length inside	23 ft. 5 ins.
Width inside	9 ft. 7 ins.
Width over all at top	9 ft. 11 ins.
Height from rail to floor	4 ft. 4 13-16 ins.
Height from rail to top of car	9 ft. 4 13-16 ins.
Height inside	5 ft.
Wheel base of car	18 ft. 6 ins.
Wheel base of truck	5 ft. 6 ins.
Truck centres	13 ft.
Number of doors on each side	4
Total number of doors	8
Door opening	2 ft. 2 ins.

Following are the chief details of the two sleeping cars and one dining car, which the Intercolonial Ry. is having built by the Pullman Co:—

Length over end sills, dining car 72 ft., sleeping car	73 ft. 6 ins.
Width over side sills	9 ft. 8 ins.
Width between deck sills	5 ft. 6 ins.
Height from rail to top of roof boards	14 ft. 2 ins.
Height from rail to centre of coupler	2 ft. 11 ins.
Underframe	Steel
Draft gear	Westinghouse
Buffing device and vestibule	Pullman standard
Gas lighting	Pintsch, Safety Car Heating and Lighting Co.
Electric lighting and fans	United States Light and Heating Co.
Trucks	6-wheel, wood, plated
Wheels	36 ins. steel tired
Journal b oxes	McCord & Co.
Axles	5 by 9 ins.

The Canadian Northern Ry., between Mar. 14 and Apr. 15, received the following additions to rolling stock:—31 ten-wheel locomotives (heavy) and 10 ten-wheel locomotives (light), from the Montreal Locomotive Works; three consolidation locomotives, from the Canada Foundry Co.; 440 box cars, 80 steel underframe flat cars, five sleeping cars and six first-class cars, from the Canadian Car and Foundry Co.; 80 steel underframe flat cars, from the Crossen Car Co.; 115 Hart-Otis cars from the Hart-Otis Car Co., five second-class and baggage cars, from the Preston Car and Coach Co.; 195 box cars from the Nova Scotia Car Works; 35 cabooses from its Winnipeg shops, and 88 flat cars.

The Toronto, Hamilton and Buffalo Ry. has ordered two six-wheel switching locomotives from the Montreal Locomotive Works. Following are the chief details:

Cylinders, diar. and stroke	21 by 28 ins.
Driving wheels, diar.	51 ins.
Boiler, diar.	67¼ and 68¾ ins.
Boiler, pressure	180 lbs.
Firebox, length and width	76 by 65¼ ins.
Tubes, no. and diar.	308-2 ins.
Tubes, length	16 ft.
Heating surface, tubes	2,567 sq. ft.
Heating surface, firebox	129 sq. ft.
Heating surface, total	2,696 sq. ft.
Grate area	32.7 sq. ft.
Weight on drivers	166,000 lbs.
Weight, tender	110,000 lbs.
Wheel base	11 ft. 6 ins.
Wheel base, engine and tender	46 ft. 8 ins.
Maximum tractive power	37,000 lbs.
Factor of adhesion	4.48
Tender, water capacity	5,500 gals.
Tender, coal capacity	8 tons

The C.P.R., between Mar. 14 and Apr 16, ordered the following rolling stock:—2,000 wooden box cars, 10 vans, six flat cars, eight stock cars, four refrigerator cars, one horse car, one baggage and smoking car, one compartment sleeping car and two U3 switching locomotives, from its Angus shops, Montreal; 3,177 steel frame box cars, 100 automobile cars from the Canadian Car and Foundry Co.; 20 Otis dump cars from the Hart-Otis Car Co.; 25 N3 locomotives from the Montreal Locomotive Works. 20 tank cars from the American Car and Foundry Co.; 2,000 steel frame box cars from the Western Steel Car and Foundry Co.; 2,000 steel frame box cars from the Standa d Steel Car Co., and one Bucyrus steam shovel and one wrecking crane.

The Toronto, Hamilton and Buffalo Ry. has ordered two consolidation locomotives, equipped with superheaters, from the Montreal Locomotive Works. Following are the chief details:—

Cylinders, diar and stroke	23 by 28 ins.
Driving wheels, diar.	68¼ and 76 ins.
Boiler pressure	180 lbs.
Firebox, length and width	96 by 75¼ ins.
Tubes, no. and diar.	202 2 ins. and 28 5¾ ins.
Tubes, length	15 ft.
Heating surface, tubes	2162 sq. ft.
Heating surface, firebox	168 sq. ft.
Heating surface, total	2,330 sq. ft.
Grate area	50.2 sq. ft.
Wheel base, driving	17 ft.
Wheel base, engine	25 ft. 9 ins.
Wheel base, engine and tender	57 ft. 3 ins.
Weight on drivers	178,000 lbs.
Weight on leading truck	25,700 lbs.
Weight, total	204,500 lbs.
Weight, tender	136,000 lbs.
Maximum tractive power	41,200 lbs.
Factor of adhesion	4.33
Tender, water capacity	7,000 gals.
Tender, coal capacity	10 tons

O'Brien, Fower and McDougall Bros., railway contractors, have ordered 20 Hart convertible ballast and construction cars, 1912 design, 40 tons capacity, in addition to the 40 mentioned in our last issue, from the Hart-Otis Car Co. The dimensions given for these in our last issue, referred to the 13 Rodger double plough distributing cars ordered by the C.P.R., having been transposed with those of the latter. Following are the chief dimensions:—

Length over end sills	36 ft 8 ins.
Width over side sills	8 ft. 10 ins.
Length inside as hopners	20 ft. 10 ins.
Length inside as gondolas	34 ft. 8 ins.
Width inside	8 ft. 8 ins.
Width over all	10 ft. 2½ ins.
Width at top	9 ft. 10 ins.
Height from rail to floor	4 ft. 4⅛ ins.
Height from rail to top of car	8 ft. 1⅜ ins.
Height inside	3 ft. 9¼ ins.
Truck centres	26 ft. 8 ins.
Wheel base of truck	5 ft. 4 ins.
Length of hopper door opening	16 ft. 8½ ins
Width of hopper door opening	2 ft.

Railway Lands Patented.—Letters patent were issued during February, covering railway lands in Manitoba, Saskatchewan, Alberta and British Columbia, as follows:—

	Acres.
Calgary and Edmonton Ry.	357.18
Canadian Pacific Ry.	183.50
Kootenay Central Ry.	85.804
Qu'Appelle, Long Lake and Saskatchewan Rd. and Steamboat Co.	3,533.47
Total	4,159.954

The International Railway General Foremen's Association, which holds its annual convention at Chicago, Ill., July 23 to 26, will discuss the following papers—How can shop foremen best promote efficiency, Shop supervision and local conditions, Shop specialization work and tools, Roundhouse efficiency, Reclaiming of scrap, and The relation of tests to shop efficiency

National Transcontinental Railway Construction

F. P. Gutelius, M. Can. Soc. C.E., and G. L. Staunton, K.C., the commissioners appointed to investigate the construction of the N.T.R., will leave Ottawa shortly to begin their investigations on the line. They have been looking over the plans and specifications and examining the contracts and reports upon which payments for work were made, in order to familiarize themselves with the position of the work. The principal object of the investigation is to determine the causes of the discrepancies between the original estimates and the actual cost of the work. It is expected that the investigation along the line from Moncton to Winnipeg will last about three months.

The section of the line from Moncton, N.B., to the southern end of the Quebec bridge is reported to be ready to be taken over from the contractors, as also is the section of the line from just outside Quebec westerly for about 350 miles. The sections of the line, the construction on which is being proceeded with east and west from Cochrane, Ont., are well advanced. Steel is reported to have been laid easterly from Cochrane to Peter Brown Creek, 150 miles. Track was laid to mileage 1197.45 from Moncton, on Division C, that is to about 37 miles east of the west end of Division C, which lies west of Cochrane. Work on the various sections of the line on which grading has not been completed was carried on where possible during the winter, and the construction camps are now filling up with men preparatory to starting up the regular season's operations.

The first locomotive to be taken into the shops at Transcona, Man., was run in Mar. 25, although the shops are not yet fully equipped for work. Good progress is being made by Harvey, Quinlan and Robinson with the erection of the car shops, and the J. D. McArthur Co. has a large force of men on laying out the yard tracks. The coal chute erected by the J. McDiarmid Co., has been completed. Tenders are under consideration for a diversion of the sewer on Verandrye and Archibald streets, necessitated by the layout of the yards, etc.

The following have been given as the levels of the line in western Quebec by K. Weatherbone, assistant engineer of District C:—Lake Abitibi, high water level, 870 ft.; Whitefish River, water level, 870 ft.; Lois River, 915 ft.; Kakmoonan River, water level, 994 ft.; Robertson Lake, water level, 1,004 ft.; branch of Nawapitechin River, water level, 978 ft.; Molesworth Lake, water level, 1,003 ft.; Spirit Lake, water level, 1,036 ft.; Harricanaw River, water level, 971 ft.; Peter Brown creek, water level, 1,003 ft.; Natagagan River, water level, 1,000 ft.; Coffee River, water level, 1,007 ft.; Bell River, water level, 994 ft.; Migiskan River, west crossing, water level, 1,071 ft.; Sunday Brook, water level, 1,092 ft.; Crooked Creek, water level, 1,123 ft.; Migiskan River, east crossing, water level, 1,158 ft.; Canon Creek, water level, 1,139 ft.; Atik River at outlet from Atik Lake, water level, 1,277 ft.; Durant Lake, water level, 1,327 ft.; Steele Lake, water level, 1,353 ft.; Kekek River, water level, 1,364 ft.; Hamilton Lake, water level, 1,427 ft.; Susie River, 1,394 ft. (April, pg. 180.)

Grand Trunk Pacific Railway Construction.

Main Line.—The plans for the proposed yards between Namayo St. and Kinistus Ave., Edmonton, involve the crossing of the latter. The company desires to cross at the level, but the city council, April 10, passed a resolution calling upon the company to put in a subway.

It has been decided that the new union station at Edmonton with the Canadian Northern Ry. will be located between First and Second Streets.

C. Schrieber, Consulting Engineer Dominion Government, returned to Ottawa, April 17, after having made a trip of inspection over the line as far as Tete Jaune Cache, B.C. He reports having found track laid to 30 miles beyond the Yellowhead Pass, and grading well advanced to Tete Jaune Cache. The contractors were putting forth every effort in order to get the line through to the Fraser River, in order that a steamship service might be opened up as far as Fort George. On the section easterly from Prince Rupert, track had been laid for 138 miles, and grading was being carried on as far as the 245th mile.

It was reported, Mar. 30, that the following subcontractors were at work east and west of Tete Jaune Cache:—H. E. Carlton and Co., A. E. Griffin and Co., Burns, Jordan and Co., Sims, Carey and Co. P. Welch, representing the contractors, Foley, Welch and Stewart, is in charge of the whole of the work in British Columbia, and is making his headquarters alternately at Fitzhugh, Alta., and at Bulkeley Summit, B.C.

Harte-Brandon Branch.—The contractors for the branch under construction from Harte to Brandon, Man., are Rigby, Hyland and Plummer, Winnipeg. It will be 24 miles long, and is to be completed during the current year.

The Dominion Parliament has voted a subsidy of 25 per cent. of the cost of a bridge across the Assiniboine River at Brandon.

The company is being invited to build a line from near Miniota, Man., to Brandon, to effect a junction with the Harte-Brandon branch.

Melville-Canora Branch.—The branch line northerly from Melville, Sask., which now terminates at Canora, will, it is said, be extended to Le Pas, Man. Recent press reports state that the surveys have been completed over a route from Canora to Le Pas.

Regina Station and Hotel.—Plans for the station at Regina have been completed, and have been communicated to the municipal authorities. The building, which will be erected at the corner of Sixteenth Ave. and Albert St., will be two stories, with a frontage of 250 ft. and a depth of about 600 ft., including the train sheds. The ground floor will contain all the public offices, while upstairs will be located the divisional staff. The estimated cost is $200,000.

Plans for the proposed hotel in Regina will, it is expected, be submitted to the municipal authorities at an early date.

Regina-Boundary Branch.—Track laying was started April 11 on the branch line from Regina to the international boundary, 155 miles. The grading is being done by J. D. McArthur, Winnipeg. It is expected to have the branch completed this year.

Regina-Moose Jaw Branch.—It is expected that the 60 mile branch connecting Regina and Moose Jaw, Sask., will be completed this year. The contractors are Rigby, Hyland and Plummer, Winnipeg.

Moose Jaw Northwesterly.—The construction of the branch line from Moose Jaw for 40 miles northwesterly was expected to have been started April 30. The contractors are Rigby, Hyland and Plummer, Winnipeg.

Battleford Branch.—Construction on the branch from Oban to Battleford, Sask., 48 miles, has been started up for the season by the contractor, J. Daudelin, Battleford. It is expected to have it completed this season.

The Prince Albert Branch, which starts at Yonge, Sask., has been completed for 67 miles. The extension of the line to Prince Albert, 54.5 miles, is being built by J. D. McArthur, Winnipeg.

Cutknife Branch.—The Board of Railway Commissioners has approved the correction of errors in the revised location plans of the branch. The contract for the building of 50 miles, from Battleford, Sask., is being carried out by Lamoreaux and Peterson, Omaha, Neb.

The Grand Trunk Pacific Railway Wolfe Creek Bridge.

Biggar to Calgary Branch.—Work is reported to have been started on this branch by Foley, Welch and Stewart. The branch starts from Biggar, and will enter Calgary over the company's Tofield-Calgary branch tracks. Its total length will be 104 miles.

Tofield-Calgary Branch.—Track laying was resumed April 8, and it is expected that the work will be completed into Calgary, Alta., early in July. The contractor is J. D. McArthur, Winnipeg. Considerable difficulty was met with in fixing the route of this line, as, in common with the Canadian Northern Ry. branch into Calgary, it passed through the C.P.R. irrigated lands.

Calgary Terminals.—It is reported that the company has purchased the N.W.M.P. barracks site in Calgary, for terminal purposes, for $1,000,000. E. J. Chamberlin, V.P. and G.M., stated Mar. 30, that a site had been acquired, and that an announcement would be made as to plans at an early date. The station would be built as soon as possible.

Calgary-Lethbridge Branch.—No contract has yet been let for the grading

of the proposed branch from Calgary to Lethbridge, 107 miles. The line will enter Lethbridge by a junction with the C.P.R. line west in the southeast quarter of sec. 2-9-22, just west of the high level bridge. Surveys have been made for an extension of the line, from Lethbridge to Coutts, about 63 miles.

Alberta Coal Branch.—The grading on this branch, which runs south from Bickerdike, Alta., is being completed by the contractors, Foley, Welch and Stewart. The distance to be completed is 25 miles. (April, fig. 180.)

The Wolf Creek Bridge at mileage 913.5 west of Winnipeg, of which an illustration is given on this page, rests on two steel towers and masonry. Its length between parapets is 652 ft. 2 in. It has two 60 ft. end deck spars, two 40 ft. tower spans, and three 150 ft. deck truss spans. The height from the river bed to bed of rail is 130 ft.

Prince Rupert Marine Terminals.—Press reports state that the British North American Construction Co., Vancouver, B.C., has been given a contract for the preliminary work on the construction of the wharves, dry dock, etc., comprising a large amount of creosoted piling and mill work construction, at a cost of about $260,000. It is said that following the completion of this work contracts will be let for the dry dock and wharf buildings, involving a further expenditure of about $1,250,000.

Great Northern Railway Lines in Canada

Fort William.—Press reports from St. Paul, Minn., April 12, state that G.N.R. interests have acquired a site along the water front at Fort William, Ont., about two miles in length, for iron and steel works, and for terminal purposes. The report adds that a line is to be built by the G.N.R. from some point in the U.S. to Fort William. Reports from Winnipeg state that the mayor of Fort William was in that city, April 11, in consultation with G.N.R. officials, and a New York engineer, in connection with the project.

Midland Great Northern Ry.—Midland Ry. of Manitoba.—The finishing up of construction on the company's line into its freight terminals in Winnipeg has been in progress since the completion of track laying at the end of 1911, and it was announced that the line would be opened for traffic May 1. The company's passenger trains will continue to be operated into the Canadian Northern Ry. station.

The G.N.R. runs its trains over its own tracks to Emerson at the International boundary, then over the Canadian Northern Ry. to about eight miles south of Winnipeg, where its own line into the city branches off. The Northern Pacific Ry. will also use this line as an entrance into Winnipeg, using its own tracks to Pembina, N.D., and then running over the C.N.R. tracks to the point of junction with the new line.

Application is being made by the company for the building of a spur line from McPhillip St. to Tecumseh St., on the north side, and on Elgin Ave. south side, along William Ave.

Calgary.—The Assistant General Manager of the G.N.R., with other officers, was in Calgary, Alta., April 8, and it is reported that they were arranging for the purchase of a right of way for a line into Calgary from the west.

Vancouver Terminals.—The contract for the erection of the first part of the new wharves between Hastings Mill and the sugar refinery, Vancouver, is reported to be practically completed. Four temporary piers reaching 700 ft. from the C.P.R. tracks have been built, and Chase and Co., the contractors, expected to finish their work by April 30. A contract for the concrete work is reported to have been let to Cummings and Deihl, at an estimated cost of $125,000. The work is expected to be started May 1. (April, pg. 183.)

Quebec and Lake St. John Railway Gas Electric Car.

The last issue of The Railway and Marine World contained a complete description of the gas electric car which the Canadian Northern Ry. Co. has procured for use on one of its subsidiary lines, the Quebec and Lake St. John Ry., to run between Quebec and Lake St. Joseph, 23 miles, the company having a summer hotel at the latter point. The description was accompanied by a diagram showing the front, side and rear elevations and the floor plan. An illustration of the car's exterior appears on this page.

The car reached Toronto on April 10, and on the following day made a trip on the C.N.O.R. Toronto-Sudbury line from Toronto to Richmond Hill, 21 miles, with the chief executive officers and a number of officials of the C.N.R. and others. On April 13 it was run over the C.N.O.R. line from Toronto to Trenton, 105 miles, a number of officials and press representatives being on board.

Quebec and Lake St. John Ry. Gas Electric Car.

It was then put on the run between Trenton and Picton, 30 miles, for a short time before being sent to Quebec, where it is to go into service May 1.

Should the car's operation prove satisfactory to the C.N.R. management it is probable that orders for others will be placed, but it is not probable that this will be done for some months.

The car referred to, which was manufactured by the General Electric Co., Schenectady, N.Y., was sold through the Canadian General Electric Co.

The Steam Railways of Connecticut, according to the latest report of the Railroad Commissioners, are all controlled by the New York, New Haven and Hartford Rd., with the sole exception of the Grand Trunk's New London Northern Line and a road 2½ miles long, owned by Cheney Bros.

Quebec Bridge.—It is said that the reports received by the Department of Railways show that satisfactory progress is being made with the building of the substructure of the bridge across the St. Lawrence, near Quebec, and that everything will be in readiness early in the fall for starting work on the erection of the superstructure.

The C.P.R. High Level Bridge at Edmonton, Alta.

The bridge being built by the C.P.R. to connect Strathcona and Edmonton, Alta., is progressing rapidly, all the masonry having been completed, and the steel work is in course of erection.

It is a steel span bridge 2,500 ft. long from face to face of ballast walls of the end abutments. This distance is made up of three 288 ft. centre spans across the river, 10 tower spans each from 30 to 50 ft. long, and 14 open spans each from 30 to 100 ft. long. The main spans over the river are supported on concrete piers which measure approximately 115 ft. from the base of rail to the footing, the latter in one instance extending to a depth of approximately 40 ft. below the river surface. The approach trestles on each bank are carried on concrete pedestals built up on concrete piling.

The bridge is to carry steam and electric railway and vehicular traffic. The railway deck on the top of the structure carries three tracks, one for C.P.R. trains and the other two for electric railway service. The roadway deck is located 20 ft. below the railway tracks, and consists of a reinforced concrete roadway 23 ft. wide, paved with wood, in addition to which there are two side paths 8 ft. wide supported on cantilever brackets.

The highways and electric line approach the bridge from Saskatchewan Ave., on the Edmonton side, and from Anthony St. on the Strathcona side. The C.P.R. tracks on the Edmonton side are carried across Victoria and MacKay Aves. on reinforced concrete structures, and across Saskatchewan and Jasper Aves. on steel structures. On the Strathcona side Anthony St. is carried over the railway tracks on a reinforced concrete bridge.

The Dominion Parliament has voted the C.P.R. as lessees of the Calgary and Edmonton Ry., a subsidy of 15% of the cost of the bridge in lieu of the subsidy of $126,000 voted in 1908.

The Atlantic Construction Co. has been incorporated under the Dominion Companies Act with authorized capital of $750,000 and office at Quebec, to carry on railway and general contracting, and in connection therewith to own and operate steam and other vessels, dredges, etc. The provisional directors are:—J. B. Craven, Larchmount, N.Y., H. Dussault, Quebec; C. Donohue, R. Wall, and L. P. Goyette, Montreal.

Traffic Orders by the Board of Railway Commissioners.

The dates given for orders are those on which the hearings took place and not those on which the orders were issued:—

Apple Rates from Maritime Province

16101 Mar. 14.—Re application of United Fruit Companies of Berwick, N.S., complaining of the proposed increase, by the C.P.R., of 4 c. per 100 lbs. in the rate on apples in carloads shipped from points in the Maritime Provinces to Winnipeg, it is ordered that the application be dismissed.

White Pass and Yukon Route Rates

16153. Mar. 18.—Re order 12783, Jan. 18, 1911, disallowing Joint Freight Tariff C.R.C. 9, and Joint Passenger Tariff C.R.C. 3, of the Pacific and Arctic Ry. and Navigation Co., the British Columbia Yukon Ry., and the British Yukon Ry. and directing the companies to substitute joint tariffs of freight and passenger tolls based on a reduction of at least one-third in each case from the freight and passenger tolls shown in the said tariffs, and re application of British Yukon Ry. Co., British Columbia Yukon Ry. and Pacific and Arctic Ry. and Navigation Co., for a rehearing, pursuant to the order of the Governor in Council of June 16, 1911 Upon the said hearing in Ottawa on March 1, 1912, counsel for the applicant companies and the Dawson board of trade appearing at the hearing, and what was alleged; and upon reading the evidence taken under commission upon the application of the Dawson board of trade, it is ordered that the order 12783 be rescinded.

Switching Charge on Lumber at Sarnia.

16161. Mar. 21. Re application of F. McGibbon and Sons, Sarnia. Ont., complaining against the rate of 1c per 100 lbs., minimum $5 a car, charged by the G.T.R. for switching lumber from the applicants' docks to their storage yard and mill at Sarnia. and applying for the same rate as charged by the Pere Marquette Rd. for switching lumber from its docks to other storage yards at Sarnia. namely 50c a car. It is ordered that the G.T.R. file a special tariff. or supplement to the existing tariff C.R.C. 1686. to take effect not later than April 8, establishing a rate of $3 a car for switching lumber from the applicants' docks to their storage yard and mill at Sarnia, for storage, sorting. or dressing, and re-shipment via the G.T.R.

Rates on B.C. Forest Products.

16225. April 3. The application of Oliver-Scrim Lumber Co., Ltd., of Vancouver, complaining of the rate of 5½c per 100 lbs. charged by the Vancouver. Fraser Valley and Southern Ry. on lumber. from Stormont Road to Vancouver, alleging that the rate should have been 3c per 100 lbs., and applying for an order directing restitution for the difference between the 5½c rate and 3c rate: and also against the rate of 3c per 100 lbs. charged by the railway from Stormont Road to New Westminster on lumber destined to points on the C.P.R. and Canadian Northern Ry.. and applying for a through rate on the basis of 1c per 100 lbs. over the rate beyond New Westminster, and for restitution on past shipments. It is ordered that the local tolls of the V., F.V. and S.R. on lumber and other forest products, in carloads. between all its stations, shall be the same as charged by the C.P.R., and the Great Northern Ry., for similar distances within their corresponding territories. The joint through rates on lumber and other forest products, in carloads, from the V., F.V. and S.R. stations between Vancouver and New Westminster to points on the C.P.R. and Canadian Northern Ry. via Vancouver or New Westminster. shall be on the basis of 1c per 100 lbs. over and above the rates from Vancouver and New Westminster to the same points. as published in the C.P.R. Special Joint Tariff C.R.C. no. W. 1574, effective Mar. 16, 1911, and supplements thereto, or subsequent issues thereof; the said basis having been prescribed by the board from stations on the Vancouver, Westminster, and Yukon Ry. to the same points; the Vancouver, Fraser Valley. and Southern Railway Company's proportion of the said joint through rates to be 2½c per 100 lbs., as alloted to the Vancouver, Westminster, and Yukon Ry.

Disallowance of G.T.P.R. Special Freight Tariff

16226. April 3. Re Grand Trunk Pacific Ry.'s special freight tariff from Westfort, Ont., C.R.C. no. A. 245, issued Mar. 24, to take effect April 1. Whereas the said tariff contains certain tolls which increase those in effect upon the same commodities and between the same points before April 1, without giving the 30 days' notice required by sec. 328 of the Railway Act, as amended. It is ordered that the increased tolls be disallowed as from April 1, and that the lower tolls in effect immediately before that date be restored.

Disallowance of G.N.R. Special Freight Tariff.

16227. April 3. Re Canadian Northern Ry's special freight tariff from Port Arthur, Fort William, and Westfort, Ont., C.R.C. no. W. 609, issued Mar. 23, to take effect April 1. Whereas the said tariff contains certain tolls which increase those in effect upon the same commodities and between the same points before April 1, without giving the 30 days' notice required by sec. 328 of the Railway Act, as amended. It is ordered that the increased tolls be disallowed as from April 1, and that the lower tolls in effect immediately before that date be restored.

Disallowance of C.P.R. Special Freight Tariff.

16228. April 3. Re C.P.R.'s special freight tariffs from Port Arthur, Fort William and Westfort, C.R.C. nos. 1692 and 1693, issued March 25, to take effect on April 1. Whereas the said tariffs contain certain tolls which increase those in effect upon the same commodities and between the same points befor April 1, without giving the 30 days' notice required by sec. 328 of the Railway Act, as amended. It is ordered that the said increased tolls be disallowed as from April 1, inclusive, and that the lower tols in effect immediately before that date be restored.

Canadian Northern Ry. Machine Tool Requirements.

The Canadian Northern Ry. has issued from Winnipeg a list covering its 1912 requirements of machine tools, for which tenders will be considered in the near future. The list is as follows:—One 80-in. drive wheel lathe, complete with 220-volt direct current motor and controller; one 42-in. double head upright boring mill for boring tires; one hollow spindle turret lathe, capable of taking bars up to 6 ins. diameter; one 24-in. upright shaper; one 14-in. upright slotting machine; one hollow spindle turret lathe, capable of taking bars up to 2⅛ ins. diameter; one 18-in. brass turret lathe; one 20-in. brass turret lathe; one 20-in. sensitive drill press; one 36-in. back geared drill press; one 8-in. pipe threading and cutting machine; one 2-in. double head bolt cutter; one 1½ in. triple head bolt cutter; one 48-in. blast fan for supplying air to oil furnace; one motor driven air compressor, capacity 1,000 cu. ft. free air per minute, compressed to 115 lbs.; one Lassiter automatic stay bolt drilling machine; one roller type tube welding machine; one 1-in. 6 spindle, semi-automatic nut tapping machine; one 24-in. planer; one 8-roll patent triple cylinder sandpapering machine; one scroll sawing machine; one 4-spindle Universal boring machine; one Universal dado and saw machine; one rod, dowel and pin machine; one bandsaw with 36-in. wheels; one concentric slide wood turning lathe; one 2½-in. double bitted surface planer; one 6-spindle vertical stay bolt threader; one No. 8 Beaudry Champion power hammer; one no. 3 washer cutting machine; one 36-in. Bullard vertical turret lathe; one 24-in. by 36-in. by 14-ft. gas engine lathe; two 24-in. column shapers; two 36-in. back geared upright drill presses. The approximate cost of the whole will be about $35,000.

G.T.R. Running Rights Over Temiskaming and Northern Ontario Ry.

The Dominion Parliament has confirmed two agreements made between the Temiskaming and Northern Ontario Ry. Commission and the Grand Trunk Ry. Co., under which the G.T.R. acquires running rights over the Ontario Government railway.

The first agreement, dated May 1, 1911, provides for the building by the T. and N.O. Ry. of a line southerly from North Bay to a junction with the G.T.R. at Nipissing Jct., and to lease the same to the G.T.R. at a rental of 4½% upon the cost, for 50 years, determinable after 20 years on five years notice. Other companies may be given the right to operate over the line, in which case a joint arrangement shall be made as to terms. The G.T.R. will pay in addition to the rental, all taxes, and keep the extension in repair, and the Commission has right of re-entry in case of default. All differences are to be arbitrated.

The second agreement, dated Dec. 1 1911, provides for the use by the G.T.R of the T. and N.O. Ry. line from the terminal yards at North Bay to the junction with the National Transcontinental Ry. at Cochrane, Ont., about 252 miles, with all sidings, side tracks, buildings, etc.. but exclusive of the repair shops and store buildings at North Bay and Englehart. The G.T.R. is given the right of joint use of the line as described with the T. and N.O.R. for $300,000 a year and interest at the rate of 4½% on all sums expended upon the betterment of the line since July 1, 1911. The Commission agrees to maintain the line and all the appurtenances up to a standard equal to the portion of the G.T.R. line between Nipissing Jct. and Toronto. The schedule of trains shall be arranged between the officials of the two railways, the Commission's superintendents to be in charge. The Commission's employes to render service to both parties equally; the G.T.R. trains to be manned by G.T.R. employes, and in cases of doubt T. and N.O.R. trains are to be given the right of way. Switching connections shall be provided and operated by the Commission, but one half of the cost of operating the same is to be paid by the G.T.R. The division of the cost of maintenance between the two lines is also provided for. The books of each railway recording the operations over the line may be mutually inspected. The agreement also provides for the terms upon which traffic is to be interchanged with the C.P.R., etc., the carriage of express matter, and the use of telegraph lines, etc. The agreement is to run for 21 years, but within three years the G.T.R. may secure legislation extending it to 25 years, with the option of a renewal for a further period of 25 years. Matters unprovided for are to be arranged by agreement. and all differences arising between the parties are to be settled by arbitration.

The Safety Car Heating and Lighting Co. has removed its Montreal office to 718 Transportation Building.

Railway Finance, Meetings, Etc.

Canada Southern Ry.—The shareholders of the Michigan Central Rd., which leases the Canada Southern Ry., will vote, May 2, on the question of authorizing the guarantee of the principal and interest of $40,000,000 fifty-year consolidated mortgage bonds of the C.S.R., with interest at not more than 5 per cent. The present issue is to be $22,500,000, to refund $14,000,000 first mortgage 6 per cent. honds due Jan. 1. 1913, $6,000,000 second mortgage 5 per cent. bonds due Mar. 1, 1913, and to cover the cost of improvements made. and to be made, to the property. A vote will also be taken to authorize the M.C.R. to join in the C.S.R. mortgage to secure the consolidated bonds, so as to cover its leasehold.

Canadian Pacific Ry.—There has been deposited with the Secretary of State at Ottawa two mortgages made between the Royal Trust Co., the Calgary and Edmonton Ry. and the C.P.R., covering, in one case, the extension of the Lacombe branch for 125 miles, and in the second, the branch line from Strathcona to Edmonton, including the high level bridge over the Saskatchewan River.

Dominion Atlantic Ry.—Passenger earnings for Mar., $33,658.27; freight earnings, $49,120.71; total earnings, $82,778.98, against $67,600 total earnings for Mar. 1911.

Grand Trunk Ry.—An issue of £1,500,000 perpetual 4 per cent. consolidated debenture stock was placed on the London, Eng., market during April, at 98½.

A London, Eng., cablegram of April 18 says the issue was only moderately successful, about 75% heing taken by the public.

Halifax and South Western Ry.—The Premier informed the Nova Scotia Legislature, Mar. 29, that all the interest due the Government upon this railway had been paid, and there were no outstanding notes or drafts. The payments made to the Government amounted to over $450,000, there having been three years' interest due, which had been temporarily met by notes discounted by the Government.

London and Port Stanley Ry.—It was reported in London, Ont., April 10, that the officials of the Pere Marquette Rd. had decided not to ask for a renewal of the lease of the L. and P. S. Ry. from the city of London.

The Pacific Coal Mines Co. has been organized in Montreal to take over the coal properties on Vancouver Island immediately adjoining the Dunsmuir properties. The capitalization of the company is $1,500,000 of 6 per cent. preferred non-accumulative participating shares, $2,000,000 of ordinary shares, and $3,500,000 of 5 per cent. bonds. The company owns a large area of coal lands, several operating mines, connecting railways, and shipping facilities. The railways at present built are seven miles in length, and connect the mines with the shipping docks. Following are the directors:—C. P. Hill, E. Bristol, K.C., M.P.; C. C. Michener, A. H. B. MacDonald

Pere Marquette Rd.—The Michigan courts have dismissed the application of the company for permission to issue bonds to the extent of $4,000,000, and upon application of the American Brake Shoe and Foundry Co., Mahwah, N.J., the U.S. courts have appointed F. W. Blair, Detroit, Mich; D. E. Waters, Grand Rapids, Mich., and N. Erb, New York, as receivers for the company. The company operates 2,320 miles of line, of which it owns in Canada, the Lake Erie and Detroit River Ry., 198.81 miles, and leases the London and Port Stanley Ry., 23.66 miles, and has, in addition, trackage rights over 136.57 miles of other Canadian railways. The bonds and other liabilities amount to about $69,689,000, and the $4,000,000 bond issue was intended to meet maturities due Apr. 1.

The Board of Railway Commissioners for Canada has approved of the appointment of the receivers above mentioned.

A protective committee for the holders of the $5.000,000 6 per cent. five year debentures, has been formed, and it is expected that other similar committees will be formed for the holders of other outstanding securities.

Quebec and Lake St. John Ry.—A special general meeting of shareholders was called to be held at Quebec, Apr. 30, to consider an agreement with the Railway Share Trust and Agency Co. and the Canadian Northern Ry. Co., with regard, among other things, to the issue by the company, of certain new securities heretofore issued by the company, for certain new securities to be issued by the company and guaranteed by the C.N.R., and to consider the issuing of certain 4 per cent. perpetual consolidated debenture stock to be guaranteed as to principal and interest by the C.N.R. The Quehec Legislature has passed an act in which authority is given to carry out the plans arranged for the readjustment of the company's finances.

Quebec Central Ry.—Two acts have been passed by the Quebec Legislature, the first confirming an agreement between the company and the C.P.R. Co., by which the latter secures a lease of the line, and the second amending the Q.C. Ry's charter, by changing the location of the head office from London, Eng., to Montreal, and making other alterations to suit the change in control.

Quebec Central Ry.—Gross earnings for February, $74,112.90; expenses, $63,711.78; net earnings, $10,401.12, against $71,445.68, gross earnings; $58,190.87, expenses; $13,254.81, net earnings for Fehruary, 1911. Aggregate gross earnings for eight months ended Feh. 29, $867,749.16; expenses, $605,705.26; net earnings, $262,043.90, against $759,541.76, aggregate gross earnings; $529,561.11, expenses; $229,980.65, net earnings, for same period, 1910-11.

Quebec Oriental Ry.—The holders of the first and second mortgage bonds of the Matapedia section met in London, Eng., April 16, to pass resolutions authorizing the directors to issue price lien bonds or other securities for $250,000 for the purpose of carrying out repairs and renewals upon the Matapedia section. The notice calling the meeting was signed by E. B. Read, President.

Temiscouata Ry.—The profit on the operation of this railway, for Jan., was $75, against a deficit for Jan., 1911, of $841.

Temiskaming and Northern Ontario Ry.—Provincial Treasurer Matheson, speaking in the Ontario Legislature recently, said the T. and N. O. Ry. had cost $17.000.000 to build, and the interest on debentures was $700,000 a year. As the earning were only about $500,000, there was a loss of $200,000 a year.

White Pass and Yukon Route.—Gross earnings for two months ended Feb. 29, $22,840, against $27,680 for same period, 1911.

Protection of Manganese Frogs against breakage at the point of connection with the Bessemer rail by maintaining a smooth joint through frequent renewal of the rail has been found to be effective in obtaining full service from the frog by T. Hickey, Roadmaster, Michigan Central Rd., St. Thomas, Ont. Such frogs have been kept in service six or seven years, he states, by taking out the Bessemer rail before its condition became bad enough to endanger the frog.

G.T.R. Semi-Annual Meeting.

The half-yearly meeting of shareholders was held in London, Eng., Apr 18, when the Chairman, A. W. Smithers, in presenting the report for the half year ended Dec. 31, 1911, said that notwithstanding the large increase in operating expenses, which were beyond control, the management was able to report an improvebent of 1% on the third preference, making 1½% for 1911, and out of $800,000 of an increase in in gross earnings, nearly eleven-twelft gross earnings, nearly eleven-twelfths was spent in Canada, leaving the remaining twelfth to come to England for distribution among shareholders. Although passenger freight rates were less, the earnings per train mile increased about 2¾d. Concerning the Grand Trunk Pacific grading, this is progressing, while practically all the branch lines were completed, and were being laid with Canadian steel. Large contracts for the delivery o frails have been made within the last few days, whereby American mills will deliver rails for G.T.P. purposes. Satisfactory completion of arrangements has been effected for running rights over the Ontario Government railway from North Bay to Cochrane, which will give the G.T.R. valuable connection and save raising of additional capital.

Referring to labor difficulties, he quoted what he had said in Oct. 1910, regarding the persistent demand for higher wages, which was felt not only in Canada, hut throughout the world. There was no use expecting the wages to go back, and in considering the position today he quoted the rates paid workers as compared with 1897, which showed an average increase from 49 to 69%. Prospects were never more promising, and he was certain that Canadian labor will put no obstacle against capital obtaining a fair return on investments.

He feelingly referred to the Titanic disaster, and the serious loss which would be sustained hy the G.T.R. in the event of C. M. Hays, who was a passenger on the steamer, not being among the survivors.

He said, "We meet today under the shadow of a great calamity. We do not know for certain, at the present moment, whether or not Mr. Hays is among those lost. But in any case the calamity is so appalling that I am sure you will all wish me to transmit to the relatives of those who perished our deepest sympathy. I a mbound to say that our fears are very great regarding Messrs. Hays, Davidson and Payne, but we have still faint hope remaining that they may yet be rescued."

The meeting passed a resolution of sympathy in silence.

Touching finally on the possible death of Mr. Hays, Mr. Smithers said that the G.T.R., is surrounded with talented and able officials, who would qualify to take up the work so successfully carried on by Mr. Hays and his helpers.

Engineers' Club of Montreal.—The club house on Beaver Hall Square is to be materially enlarged. There will be on the ground floor a lounge, hall porter's office, writing rooms, billiard room, coat room, lavatory, service department and minor offices. On the second floor there will be a reading room, secretary's room, private dining rooms, a 79 x 29 ft. club dining room 22 ft. high, smoking rooms, a ladies' dining room and a reception room. In the top floor, in addition to a few small dining and card rooms, there will be several bed rooms. The kitchen and mechanical equipment will be in the basement. When the work is finished the club house will be about three times its present size.

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Enormous Rolling Stock Orders Placed by the C.P.R.

During the past month the C.P.R. has given out the largest orders for cars which have ever been placed in Canada. The orders for freight equipment alone comprises between 9,000 and 10,000 cars, and will involve an expenditure of over $10,000,000.

In addition to this 27 locomotives were ordered and other locomotive orders are pending.

Car building Plant for West Canada.

N. Curry, President, and W. W. Butler, Vice President, Canadian Car and Foundry Co., left Montreal about the middle of April for Port Arthur and Fort William, Ont., to select a site for a car building plant, Mr. Butler intending to go on to British Columbia to select a site there also, probably at Vancouver, or in its vicinity. We are officially advised that the plants will be complete and self-contained as far as possible, with facilities for manufacturing all steel, all wood and composite passenger and freight cars. They will comprise also axle forging shops, grey iron and steel foundries, bolster and brake beam shops, and all the accessories necessary to enable the company to produce everything possible that enters into the construction of cars, thereby enabling it to manufacture at a minimum of cos.

F. B. McCurdy, J. R. McLeod and F. M. Brown, of Halifax, N.S., with their associates, have entered into an agreement with the city of Port Arthur for the erection of a steel and wooden car plant, the company, the Ontario and Western Car Co., Ltd., to be capitalized at $5,000,000. The company agrees to expend not less than $1,250,000 on buildings and machinery, the plant to have a capacity of 40 cars a day, and to be capable of employing 1,000 men, of which 500 are to be at work by Dec. 15, 1913. The company is to be given a deed of 102 acres of land, and 52 acres of water, along its waterfront. The company will issue bonds for $2,000,000, of which the city will guarantee 33 1-3 per cent.

Railway Route Maps Approved.

The following route plans have been approved by the Minister of Railways since those published in The Railway and Marine World for March, pg. 126:—

ALBERTA RY AND IRRIGATION CO.—Mar. 30. From Stirling easterly, about 36 miles.

BURRARD, WESTMINSTER AND BOUNDARY RY. AND NAVIGATION CO.—From Mission to Port Moody, B.C., about 40 miles.

CANADIAN NORTHERN RY.—Revision on Sudbury-Port Arthur, Ont., line, 10.4 miles.

CANADIAN PACIFIC RY.—Swift Current towards Camrose, Alta. Partly approved. 195.48 miles. The part where it parallels the Canadian Northern Ry. Saskatoon-Calgary branch, left over for revision.

Revision between Suffield and Kipp, Alta., about 18 miles.

Revision between Bull's Head and Purple Springs on Crowsnest branch, about 36 miles

Mar. 30. From 20 miles northeast of Kerrobert to the G.T.P.R. near Reford, about 15 miles.

CARIBOO, BARKERVILLE AND WILLOW RIVER RY.—From Eagle Lake on G. T. Pacific Ry., east of Fort George, B.C., southwards along the Willow River to Barkerville, about 140 miles.

CENTRAL RAILWAY OF CANADA.—Revision between St. Eustache and Carillon, about 27 miles.

ESQUIMALT AND NANAIMO RY.—Mar. 30. From Ayster River to Hardy Bay, about 140 miles.

KETTLE VALLEY RAILWAY.—Revision between Carmi and Penticton, B.C., 85 miles.

NORTHERN NEW BRUNSWICK AND SEABOARD RY.—April 9. From Drummond Mines to Allston Point, 25.9 miles.

QUEBEC AND SAGUENAY RY.—Mar. 30. Cap Tourmente to Chicoutimi, 126.5 miles.

Canadian Freight Association's Officers, Etc.

At the recent annual meeting it was decided to abolish the offices of president and vice president and to appoint a chairman instead. T. Marshall, heretofore Secretary-Treasurer, was appointed Chairman. The standing committees for the current year are as follows:—

ADVISORY COMMITTEE—C. A. Hayes, W. M. Kirkpatrick, G. C. Ransom, G. H. Shaw.

EXECUTIVE COMMITTEE—W. M. Kirkpatrick, F. F. Backus, H. C. Martin, Wm. Phillips.

CLASSIFICATION COMMITTEE—W. M. Kirkpatrick, W. Phillips, E. N. Todd, H. E. Macdonell, M. H. Brown, H. C. Martin, F. J. Watson, L. Macdonald, G. T. Pettigrew, R. E. Perry.

INSPECTION COMMITTEE—R. W. Long, F. Conway, G. C. Ransom, J. P. Daly, W. B. Bamford, G. Tombs, R. W. Youngs, A. D. Huff, H. A. Young, W. S. Elliot.

United States Regulations Regarding the Sealing of Cars.

The United States Treasury Department has issued new regulations covering the sealing of cars in which import and export traffic is carried. It orders that in future the Tyden car seal, which is self-locking, numbered consecutively and applied without a press, is to be used to the exclusion of all other devices to seal railway cars and compartments of vessels containing merchandise shipped in bond or under entry for immediate transportation from port to port within the U.S., goods forwarded under transportation and exportation entry, merchandise shipped from place to place in the U.S. through Canada and Mexico, merchandise shipped from place to place in Canada or Mexico through the U.S., and cars sealed by U.S. consuls or customs officers stationed at places in contiguous foreign territory for that purpose; that the present seals may be used by carriers until the supply on hand is consumed, but all carriers are required to begin the use of the Tyden seal not later than July 1, and the use of other seals will be discontinued after June 30.

Steps are being taken to organize a Canadian Society of Civil Engineers branch in Saskatchewan. A. J. McPherson, B.A.Sc., of Regina, Superintendent of Provincial Highways, is chairman of the organization committee.

The Canadian Northern Prairie Lands Co., a subsidiary of the C. N. R. Co., sold 480 acres during Feb., realizing $7.056, an average of $14.70 an acre. Up to Feb. 29, it had sold 428,200 acres realizing $3,339,953, and has 71,600 acres remaining unsold.

The Customs officers at Medicine Hat, Alta., recently seized 30 horses, eight waggons, and various other effects which had been brought in from the United States as settlers' effects, but which, it is claimed, in reality formed part of a contractor's plant for use on C.P.R. work.

RAILWAY DEVELOPMENT.

Projected Lines, Surveys, Construction, Betterments, Etc.

Alberta Pacific Ry.—The Dominion Parliament has voted a subsidy in aid of the building of 100 miles from Cardston, northwesterly via Pincher Creek, to Lundbreck, on the C.P.R. Crow's Nest Pass branch, and then northerly, but west of the Porcupine Hills, towards Calgary, Alta. (Mar., pg. 120.)

Alberta, Peace River and Eastern Ry.—A meeting of shareholders was held in Ottawa, April 20, to elect directors, and organize the company.

The Dominion Parliament extended the time within which the projected railway may be built. (Feb., pg. 67.)

Algoma Central and Hudson Bay Ry.—A subsidy has been voted by the Dominion Parliament in aid of the building of this railway from Sault Ste. Marie to the C.P.R. transcontinental line between White River and Dalton stations, Ont., not to exceed 200 miles, for a line from Michipicoten Harbor towards the C.P.R. transcontinental line, not to exceed 50 miles, and for 50 miles from the C.P.R. transcontinental line towards the National Transcontinental Ry. These subsidies are in lieu of those granted in 1910. A new subsidy was also voted for the extension of the line from the C.P.R. northerly to a junction with the National Transcontinental Ry., a further 65 miles.

The Board of Railway Commisioners has approved of revised location plans between mileage 123.74 and 130.87, and of the connection with the National Transcontinental Ry. at Grant. (Mar., pg. 120.)

Algoma Eastern Ry.—The Dominion Parliament has voted subsidies in aid of the building of a line from the line between Sudbury and Little Current, for 76 miles westerly towards the Algoma Central Ry., and for a line 30 miles northerly from Sudbury. These are in lieu of subsidies voted in 1910.

The Dominion Parliament has extended the time for the building of the company's authorized lines, except the section lying between Sudbury and Little Current, which is now almost completed, and the section between Meaford and Owen Sound, which it is said will not be built. (Jan., pg. 21.)

British Columbia and Dawson Ry.—The Dominion Parliament has extended the time within which the projected line may be built, and authorized the building of a branch from Fort George, B.C., via the Parsnip, Peace and Fowler rivers, to a junction with the main line at Telegraph Creek on the Stikene River; from some point on the above line to Peace River Landing, Alta., and from Vancouver to Lillooet. (Feb., pg. 67.)

Bruce Mines and Algoma Ry.—A subsidy has been voted by the Dominion Parliament for the building of a line from Rock Lake northerly and easterly to a junction with the C.P.R. transcontinental line, near Winneboga River, Ont., about 50 miles. (Feb., pg. 67.)

Burrard Inlet Tunnel and Bridge Co.—We are officially advised that all the preliminary work, on surveys, location, etc., has been completed, and that the tests made for the foundations of the proposed bridge across the Second Narrows of the Burrard Inlet, have been satisfactory. The plans for the bridge are being prepared by Sir J. Wolfe Barry and partners, London, Eng., with whom are associated Messrs. Cleveland and Cameron, Vancouver. It is expected to have the contracts let at an early date, and to have the work on the substructure under way during this year.

Beyond a certain amount of location work nothing has been done in connection with the company's tunnel project.

The Dominion Parliament has voted subsidies in aid of the following lines:—From Eburne to mouth of Seymour Creek, not exceeding 10 miles; from Seymour Creek to Deep Cove, not exceeding 5 miles. from Seymour Creek to Horse Shoe Bay, not exceeding 14 miles; from Pender St., Vancouver, to North Vancouver, B.C., not exceeding 3 miles. (April, pg. 181.)

Calgary and Fernie Ry.—A subsidy has been voted in aid of the building of a railway from Calgary, Alta., southwesterly via Kananaskis Pass, and the headquarters of the Elk River to Fernie, B.C., not to exceed 100 miles.

The Dominion Parliament has extended the time within which the line authorized by chap. 71, statutes, 1906, as amended by subsequent acts, may be constructed. (Mar., pg. 120.)

Campbell River towards Fort George. The Dominion Parliament has voted a subsidy in aid of the building of a line from near Campbell River, on the Esquimalt and Nanaimo Ry., 100 miles in the direction of Fort George, on the mainland of B.C. A subsidy for this railway was voted in 1908 to the Vancouver Island and Eastern Ry., but in revoting the subsidy Parliament decided to leave the subsidy to be availed of by any company.

Canada and Gulf Terminal Ry.—The Dominion Parliament has voted a subsidy for the building of a line from Matane easterly to Gaspe Basin, about 200 miles. The Quebec Legislature has granted 2,000 acres a mile in and of the building of the line from Matane to Gaspe Basin, but giving the mileage as 190. (Feb., pg. 67.)

Caribou, Barkerville and Willow River Ry.—A subsidy has been voted by the Dominion Parliament in aid of the building of a line from near Eagle Lake, on the Grand Trunk Pacific Ry., to Barkerville, B.C., about 107 miles. A subsidy not to exceed $95,000 was also voted in aid of the building of 20 railway bridges on the line, the basis of payment being 20% of the cost of each bridge. (Sept., 1911, pg. 853.

Central Ry. of Canada.—We are officially advised that the Minister of Railways is being asked to approve a route map of the line from Carlton, Que., to South Indian, Ont., and that as soon as this has been obtained, progress will be made towards construction. (April., pg. 181.)

Chaudiere Jct. to Sherbrooke, Etc.—The Quebec Legislature has granted 2,000 acres of land a mile for a line of 120 miles from Chaudiere Jct., to Sherbrooke; a 10 mile branch from St. Agathe to Lyster; and a 30 mile branch from St. Agathe to Black Lake, Que.

Delaware and Hudson Co.—The Quebec Legislature has granted land subsidies in aid of the building of additional lines by the following companies controlled by the D. and H. Co. in Canada:—Napierville Jct. Ry., 1,000 acres a mile for a line from St. Constant to the international boundary, about 27 miles. Quebec, Montreal and Southern Ry., 740 acres a mile, for a line from Berancourt to the St. Lawrence River, and 99,000 acres for a line of 52 miles from St. Philomene towards Levis. (Mar., pg. 120.)

Dominion Atlantic Ry.—An extension of time for the building of a branch from the Cornwallis Valley branch to the main line near Middleton, N.S., has been granted by the Dominion Parliament. (April, pg. 181.)

Edmonton, Dunvegan and British Columbia Ry.—J. D. McArthur, President, is reported as stating that it is intended to proceed with construction immediately and push it as fast as possible. It is hoped to have the line in operation to the crossing of the Athabasca River, 100 miles, this year, and on to Dunvegan within three years. (April, pg. 181)

The Erie, London and Tillsonburg Ry. was granted an extension of time to build its projected line from Port Burwell to London, Ont., at the recent session of the Dominion Parliament. (Nov., 1911, pg. 1035.)

Esquimalt and Nanaimo Ry.—A subsidy has been granted by the Dominion Parliament in place of those voted in 1907 and 1908, for the building of a line from Wellington to Alberni, 60 miles: from McBride Jct. towards Sandwich, 45 miles, and from Sandwich to Campbell River, 38 miles.

The Dominion Parliament has authorized the building of a line from near Oyster Bay to Homely Inlet, Vancouver Island; extending the time for building certain lines, and provided that no portion of the branch lines authorized to be built by chap. 14, British Columbia Statutes, 1884, shall be built unless authorized by the Governor in Council. (April, pg. 181.)

Fredericton and Grand Lake Coal and Ry. Co.—A subsidy has been voted by the Dominion Parliament for the building of a line from Gibson, on the Intercolonial Ry., to Minto, with a branch to Marysville, N.B., a total length of 35 miles. (April, pg. 181.)

Ha Ha Bay Ry.—The Dominion Parliament has voted a subsidy in respect of the following lines:—From St. Mathias to Ha Ha Bay, not exceeding 20 miles; from Labrosse Jct. to the Saguenay River, not exceeding 5 miles; from La Terriere Jct. northerly to Lake Kenogami, not exceeding 12 miles; from near Bagotville to St. Alexis, not exceeding 3 miles. In lieu of a 40 mile subsidy granted in 1910.

The Quebec Legislature has voted 4,000 acres of land a mile to complete the building of the line to Ha Ha Bay, 9.5 miles, and at the rate of 2,000 acres a mile for a four mile branch to Chicoutimi, and for a 12 mile branch through La Terriere Village to Lake Kenogami. (Feb., pg. 67.)

Hudson Bay and Pacific Ry.—A London, Eng., cablegram, says application was made there, April 17, before Mr. Justice Eady, for the compulsory winding up of this company. Counsel for the company opposed, and asked the judge to allow the motion to stand over for a month, when petitioners who desired it could be paid off, he stated. The company was raising funds for the construction of the railway. The judge granted the company's application. This is the company which proposed to build a line from Prince Albert, Sask., to Fort Churchill. (April, pg. 181.)

Indian River Ry.—A subsidy at the rate of 3,000 acres of land a mile for a line of 19 miles from the northern extremity of Lake Megantic and along the border of the lake to the international boundary, has been granted by the Quebec Legislature. (May, 1911. pg. 409.)

Intercolonial Ry.—The contract for building of the line from Dartmouth to Deans, N.S., 73 miles, for which M. P. and J. T. Davis were given the contract by the Dominion Government, will be carried out by Cavicchi and Pegano, who have taken the entire work from the first mentioned firm.

The work, for which a contract has been arranged, with the late Government, for the building of a line from Guysboro to Country Harbor, N.S., to connect up with the Dartmouth-Deans settlement line, will not be gone on

with. A similar decision has been reached by the Government with regard to the projected line to Baddeck on Cape Breton Island, N.S., for the building of which tenders were asked by the late government.

The question of the building of a second track for the entire distance between Halifax, N.S., and Moncton, N.B., is being considered. Some portion of the line out of Halifax, and at the Moncton end, is already double tracked, and if the rest of the work be undertaken, there will be considerable grade reduction and curve elimination done. However, it is not proposed to make the whole section a double track line, as it is suggested that a new single track line be built around the Cobequid Mountain, from near Parrsboro. by Minas Basin to Truro. The negotitaions reported to be in progress with the C.P.R. for running rights into Halifax, are said to be involved in the consideration of this second track work. (April, pg. 181.)

Interprovincial and James Bay Ry.—A subsidy in aid of the building of this line from the Lake Temiscamingue Colonization Ry., a C.P.R. branch terminating at Timiskaming, with a branch to Kippawa, Que., to the Des Quinze River, 50 miles, has been voted by the Dominion Parliament, in lieu of that given in 1906.

The company was originally incorporated by the Dominion Parliament in 1901, and the time for construction has been extended on several occasions, the most recent being at the recent session.

The Quebec Legislature has granted 4,000 acres of land a mile for 50 miles of the line from the present terminus of the C.P.R. line at Gordon Creek, to Ville Marie. (Dec., 1911, pg. 1139.)

Kettle Valley Lines.—It is reported that an arrangement is being made between the company and the British Columbia Government for changing the route of the line now under construction, in order that the main line may be carried through Princeton, B.C., instead of building a branch into the town. Survey parties are in the field locating the line right through to Hope, and it is expected to have the greater portion of the work necessary to complete the line under contract early in July. The only section which will then be open will be that from the summit to Hope, with reference to which negotiations are in progress between the company, the Vancouver, Victoria and Eastern Ry. and the B.C. Government. It has been arranged that the termini of the line shall be at Midway and at Hope.

The Dominion Parliament has revoked the subsidy granted in 1910 for a line from Grand Forks for fifty miles up the north fork of Kettle River, B.C. Parliament also voted the company $250,000 towards the building of a bridge across the Fraser River near Hope.

The Dominion Parliament has extended the time for the building of the lines authorized to be constructed by chap. 68, statutes of 1901, as amended in 1904, 1906 and 1910, and has authorized the building of a line from Vernon southeasterly to Penticton, B.C. April, pg. 181.)

Kootenay and Alberta Ry—The Dominion Parliament has granted an extension of time for the building of the projected railway from near Cowley, Alta., to the Flathead River country, and from Cowley along the Milk River Valley to the international boundary near Coutts, Alta. (Dec., 1911, pg. 1139.)

London and Port Stanley Ry.—The London, Ont., city council, is considering the advisability of buying land in the city in order to increase the siding accommodation. (Feb., pg. 68.)

Manitoba and Nelson Ry.—The Manitoba Legislature has incorporated a company with this title to build a railway, to be operated by steam, electricity or other power, from lot 3, Kildonan, near Winnipeg, northerly, but west of the C.P.R. Gimli branch, to Sturgeon Bay, thence to Grand Rapids, and thence northerly and easterly to Hudson Bay. Power is also given to build branch lines. The provisional directors are:—C. W. N. Kennedy, C. Vokes, Winnipeg; A. C. Clare, Parkdale, Man.; B. S. Benson, Selkirk, Man.

Montreal Central Terminal Co—The Dominion Parliament has extended the time within which the bridges and tunnels at Montreal, authorized by chap. 109, statutes of 1909, may be constructed. It is provided that the company may only exercise its powers upon the authority of the Governor in Council, and that it can only have power of expropriation upon obtaining special legislation. (April, pg. 182.)

Montreal to National Transcontinental Ry. and Hudson Bay.—A subsidy has been voted by the Dominion Parliament in aid of the building of a line from near Montreal, to the National Transcontinental Ry., about 837 miles west of Moncton, a distance of not to exceed 200 miles. This is in lieu of a subsidy granted in 1910. A subsidy has also been voted for a line from near mileage 837 west of Moncton on the National Transcontinental Ry., to the mouth of the Nottaway River on James Bay, not to exceed 300 miles.

The Quebec Legislature has granted 4,000 acres of land a mile for the first section of the line mentioned above, and 5,000 acres a mile for the second section. (See Joliette and Lake Manuan Ry., on another page.)

North Shore Power, Ry. and Navigation Co.—The Quebec Legislature has granted 3,000 acres of land a mile in aid of a line from Seven Islands Bay, towards Clark City and St. Margaret River, Que.

North Shore Ry.—Subsidies have been voted by the Dominion Parliament in aid of the following lines:—From Adamsville to a junction with the National Transcontinental Ry., near Snow Shoe Lake, not exceeding 20 miles, and from Beersville, via Rexton, to Richibucto Head, not exceeding 20 miles. (April, pg. 182.)

Northern New Brunswick and Seaboard Ry.—The Dominion Parliament has voted a subsidy for a line from the Drummond mines at Austin Brook, a branch of the Nipisiguit River above Great Falls, to the Intercolonial Ry, thence either to Alston Point, on the north side, or Caron Point on the south side of Bathurst Harbor, N.B., the total length not to exceed 26 miles. (Mar., 1911, pg. 209.)

Northern Territorial Ry.—The Dominion Parliament has incorporated a company with this title to build a line. as previously described, from Fort Churchill, on Hudson Bay, to the Pacific coast, with branches to Fort McMurray and Smooton. (Mar., pg. 121.)

Ottawa, Abitibi and Hudson Bay Ry. The Quebec Legislature has incorporated a company with this title to build a railway from Hull to Grand Lake Victoria, and thence to James Bay. (Feb., pg. 68.)

The Ottawa, Brockville and St. Lawrence Ry. was originally incorporated in 1900, by the Dominion Parliament, and has obtained extensions of time for building the line from Ottawa to Brockville, on five occasions since. A sixth extension of time was granted at the recent session. (Jan., pg. 23.)

Ottawa, Montreal and Eastern Ry.—The Dominion Parliament has extended the time within which the company may build the railway and tunnel under the St. Lawrence River, which were authorized by chap. 141, statutes of 1910. The company's powers may only be exercised by authorization of the Governor-in-Council, and expropriation powers can only be obtained by a future act. (Feb., pg. 68.)

Pacific and Atlantic Ry.—The Dominion Parliament has extended the time within which the company may build its projected line from Ottawa to Georgian Bay, and Lake Ontario, with branch lines to Manitoulin Island and other places. The company was originally incorporated by the Ontario Legislature in 1886, J. Conmee being one of the provisional directors; and in 1906, it was declared to be a work for the general advantage of Canada. (Jan., pg. 23.)

Pacific Great Eastern Ry—The company has opened offices in Victoria, B.C., to conform to the charter requirements, and also in Vancouver, from which the construction operations will be directed. The formal organization has been completed, the officers and directors being:—President, J. W. Stewart; Vice President and General Manager, P. Welch. Vice President and General Counsel, D'Arcy Tate; other director, T. Foley.

In an interview April 17, Vice President D'A. Tate said engineers were at work locating the line out of North Vancouver, and out of Fort George southerly. It is hoped that construction will be started at an early date, and when it will be pushed through with dispatch.

J. Callaghan, heretofore Division Engineer, G.T. Pacific Ry., Fitzhugh, Alta., has been appointed chief engineer.

It is said that the company has entered into negotiations for the use of the bridge to be built across the second narrows of Burrard Inlet by the Burrard Inlet Tunnel and Bridge Co., and the Vancouver, Westminster and Yukon Ry., and press reports state that the line already built from near Vancouver in the direction of Pemberton Meadows, by the Howe Sound and Northern Ry., is to be acquired by the P.G.E. Ry. (April, pg. 179.)

Pacific, Trans-Canada and Hudson Bay Ry.—The Dominion Parliament has incorporated a company with this title to build a railway from Edmonton via Athabasca Landing, easterly to Fort Churchill or Port Nelson on Hudson Bay, and westerly to Prince Rupert or the Portland Canal, B.C. (Mar., pg. 121.)

Quebec and Saguenay Ry.—We are officially advised that construction work has been proceeded with in a satisfactory manner during the past winter, the smallest monthly estimate being $130,000. The work is very heavy and about 500 tons of explosives have been used during the nine months ended Mar. It is confidently expected that track will be laid on the 65 miles of the line at present under contract by Sept. O'Brien and Doheny, contractors, intend to start tracklaying from the Murray Bay end of the line as well as from the starting point at St. Joachim. The boring of the tunnels at Cap Rouge and Cap Martin is being proceeded with satisfactorily.

Under the direction of A. H. N. Bruce, Chief Engineer, an exploratory survey was made by a party under E. S. M. Lovelace for an extension of the line from Murray Bay to Ha Ha Bay, 73 miles. The engineers report that a satisfactory route can be obtained, and that the construction of the line will not be expensive. It is the intention to build this extension in the near future, and eventually to continue the line to Seven Islands, and along the shore of the Gulf of St. Lawrence to Cape Charles at the entrance to the Strait of Belle Isle. With a line of steamships from the port reached at this point, to a port on the west coast of Ireland, the ocean trip could be made in less than three days,

thus effecting a very considerable saving in time for the mainland passenger service.

The Dominion Parliament has voted a subsidy in aid of the building of a line from St. Joachim, northeasterly for not exceeding 62.8 miles, and from the latter point for 107.2 miles in the direction of Seven Islands, Que., in lieu of that granted in 1910.

The Quebec Legislature has granted 3,000 acres of land a mile for a line from St. Joachim to Nairn's Falls, 63 miles: and 2,000 acres a mile for 72 miles from Nairn's Falls to Ha Ha Bay. (Mar., pg. 121.)

Reid Newfoundland Co.—We are officially advised that it is expected to complete the construction of the Trepassey branch this season. Of the total length of 102 miles, 60 have been completed. It is also intended to build the branch to Hearts Content, 34 miles. This will make 76 miles to be built. (April, pg. 182.)

Roberval-Saguenay Ry.—We are officially advised that surveys have been made for about 52 miles of line from Mathias Jct. to about two miles beyond the Peribonka River, Que. The locating part was expected to reach the Mistassini River, May 1, which would cover the first 80 miles projected. A branch will be built from near Mathias Jct. early this season to the Jouquieres pulp mills. Mathias Jct. is a junction on the Quebec and Lake St. John Ry., at which the Ha Ha Bay Ry. has one of its termini. The constructed and projected lines of the Ha Ha Bay Ry., extend from Bagotville, on Ha Ha Bay, to Mathias Jct., with branches through La Terriere village to the shores of Lake Kenogami, and to Chicoutimi on the shore of the Saguenay River. The Roberval-Sagneuay Ry. will really be an extension of the main line to the Mistissani River, and will enable pulpwood, etc., to be brought out from the country north of Lake St. John to deep water navigation on Ha Ha Bay. The Dominion Government is making a hydrographic survey of the Bay, and as soon as this is completed it is proposed to build deep water docks.

The officers of the R.S. Ry. are:—President, J. E. A. Dubuc; Vice President, J. E. Cloutier; Secretary, R. Belleau; Treasurer, J. E. Robitaille; Chief Engineer, J. F. Grenon. They all reside in Chicoutimi, and are all more or less interested in the Ha Ha Bay Ry.

The Quebec Legislature has granted a subsidy for a line of 80 miles from the junction of the Q. and L. St. J. Ry. and the H.H.B. Ry. in the direction of the Mistassini Ry.

Temiskaming and Northern Ontario Ry.—In connection with the plans to revise the location of the first 30 or 35 miles out of North Bay in order to provide a lower gradient and less curvature, we are officially advised that the Commissioners will not undertake the work during this year. The Elk Lake branch will leave the main line at Earlton, and run 28.7 miles to Elk Lake. The maximum gradient will be 1.00% compensated, and the maximum curvature 6°. The quantity of rock work is very light, amounting to about 1,000 cubic yards; the estimated quantity of earth excavation is 340,000 cubic yards. There will be one timber trestle over the Jean Baptiste River at mileage 12. This will be a permanent structure 600 ft. long and 70 ft. high from water line to base of rail at the centre. There will be a steel bridge about 300 ft. long over the Montreal River at mileage 22.75, consisting of one large centre span and two approach spans. S. B. Clements is Chief Engineer. The contractors are McCaffery and McQuigge, Toronto. Work was started April 7.

The House of Commons passed a measure granting a subsidy upon the usual terms and conditions to the T. and N.O.R. for the line from North Bay to Cochrane, 252.8 miles; the branch from Englehart to Charlton, 7.8 miles; the branch from Cobalt to Kerr Lake, 3.9 miles; the branch from Iroquois Falls to Timmins, 33.16 miles, and the extension from North Bay to Nipissing Jct., 2.18 miles. The Senate, however, refused to pass it. (April, pg. 183.)

Vancouver, Westminster and Yukon Ry.—A subsidy has been voted by the Dominion Parliament for a line, not exceeding 100 miles, from Vancouver, way of Burrard Inlet northerly, in lieu of that voted in 1908.

A subsidy of $350,000 was also voted towards the construction of a bridge across Burrard Inlet, in lieu of one voted in 1908. (Oct., 1911, pg. 937.)

THE CANADA SOUTHERN RAILWAY COMPANY.

NOTICE IS HEREBY GIVEN that the annual general meeting of the shareholders of The Canada Southern Railway Company will be held at the Head Office of the company in the City of St. Thomas, Ontario, on Wednesday, the 5th day of June, 1912, at 11 o'clock in the forenoon, for the purpose of electing directors and approving, ratifying and confirming the action taken by the Board of Directors of the company at meeting held March 7th, 1912, authorizing the execution of a mortgage upon its railroad and other property providing for the issue of corporate bonds to an aggregate amount not exceeding $40,000,000, bearing interest at a rate not exceeding 5% per annum, under the provisions of an indenture of lease, dated August 15th, 1903, of which amount $22,500,000 are proposed to be presently issued, and guaranteed by The Michigan Central Railroad Company, for the purpose of refunding the First and Second Mortgage Bonds of this company maturing January 1st, 1913, and March 1st, 1913, respectively, and to cover the cost of improvements made and to be made to this company's property; and also for the transaction of such other business as may be brought before the meeting.

NICOL KINGSMILL,
Secretary.

Dated St. Thomas, Ont., May 3rd, 1912.

NIAGARA GRAND ISLAND BRIDGE COMPANY.

The annual general meeting of the Niagara Grand Island Bridge Company, for the election of directors and other general purposes, will be held on Wednesday, the 5th of June, 1912, at the hour of eleven o'clock in the forenoon, at the company's head office in the City of St. Thomas.

NICOL KINGSMILL,
Secretary N.G.I.B. Co.

23rd April, 1912.

NIAGARA RIVER BRIDGE COMPANY

The annual general meeting of the Niagara River Bridge Company, for the election of directors and other general purposes, will be held on Wednesday, the 5th of June, 1912, at the hour of eleven o'clock in the forenoon, at the offices of the Canada Southern Railway Company, in the City of St. Thomas.

NICOL KINGSMILL,
Secretary N.R.B. Co.

23rd April, 1912.

POSITION WANTED.

Technical Graduate, experienced in all classes of freight and passenger equipment in plant office and engineering, will make permanent change to company offering good opening. Apply box 117 S., The Railway and Marine World, Toronto.

Dominion Government Railway to Hudson Bay.

The Dominion Parliament has voted $1,500,000 on account of construction from Le Pas, Man., to Hudson Bay, in addition to the $2,000,000 previously voted. The last-named sum the Minister of Railways explained would not do more than cover the work on the contract which had already been let for 185 miles. It was expected to let a further contract in May or June, by which time the location of the port on Hudson Bay would be settled. When that was done, contracts for the balance of the line, and the terminal facilities, elevators and harbor improvements, would be let. The 185 miles now under contract was expected to be completed by Jan. 1, 1913.

It is reported that the piers for the erection of the bridge across the Saskatchewan River at Le Pas have been completed, by Mackenzie, Mann and Co., Ltd., and that preparatory work for the erection of the superstructure is being gone on with. Work is being gone on with on the section of the line from Le Pas to Thicket Portage at Split Lake, 185 miles, by McMillan Bros., who have been given the contract by the original contractors, the J. D. McArthur Co. The heaviest piece of work at present struck is a 1,000 ft. rock cutting about five miles from Le Pas. It is said that the second section of the line to be placed under contract will be 100 miles.

A proclamation has been issued by the Governor-General that the provisions of part III of the Criminal Code, chap. 146 of the revised statutes of 1906, shall be enforced within a distance of 10 miles on either side of the line under construction. The only sections of part III not being in force are declared to be 144 to 149 inclusive. (April, page 193.)

Screw Reverse Gear.—In the April issue of The Railway and Marine World, in the article describing the screw reverse gear as applied to some recent C.P.R. locomotives, it was stated that the first locomotive so equipped on this continent was one built during 1911 by the American Locomotive Co. for the Chesapeake and Ohio Ry. W. A. Gray writes us from Chicago that three locomotives so equipped were built by the Grand Trunk Ry. in the Hamilton, Ont., shops before removal of the shops to their present location at Stratford about 1883. These three locomotives were numbered and named as follows: 728, Empress; 729, Princess, and 730, Duchess. For some reason this screw reverse gear did not prove satisfactory, and, in consequence, the locomotives were changed over to the old reverse lever.

The Coast Construction Co., Ltd., has been incorporated under the New Brunswick Companies' Act, to build railways, and harbor works, and do a general contracting business. The head office is at Fredericton Jct., N.B., the capital is $49,000, and the provisional directors are: E. R. Teed, Woodstock, N.B.; J. S. Eagles, St. John, N.B.; G. D. Jones, Apohaqui, N.B.; T. B. Harrt, Fredericton Jct., N.B.; S. A. McLean, Sussex, N.B.

The Intercolonial Ry. has ordered 100 platform cars, 80,000 lbs. capacity, 10 refrigerator cars, 20 stock cars, and one first class car, from the Canadian Car and Foundry Co., Montreal; 50 Hart-Otis steel dump cars, 100,000 lbs. capacity, from the Hart-Otis Co., Montreal; one first class car from the Preston Car and Coach Co., Preston, Ont.; four switching and five consolidation locomotives, from the Canadian Locomotive Co., Kingston, Ont., and 373 box cars, 60,000 lbs. capacity, from the Nova Scotia Car Works Halifax.

Mainly About Transportation People.

C. R. HOSMER, director, C.P.R., was on a motoring trip in France during April.

H. LOGAN has retired from the directorate of the Maritime Coal Ry. and Power Co.

Lady SHAUGHNESSY and the Misses Shaughnessy returned to Canada from Europe Apr. 11.

J. W. LOUD, ex-Traffic Manager, G.T.R., Mrs. and the Misses Loud are making a Mediterranean trip.

Sir THOS. SHAUGHNESSY was entertained at dinner by the board of trade at Halifax, N.S., Apr. 11.

C. H. RUST, M. Can. Soc. C.E., City Engineer of Toronto, has resigned to accept a similar position at Victoria, B.C.

H. E. GRANT, formerly sales agent, British Columbia Electric Ry., has gone into private business in San Francisco, Cal.

D. E. GALLOWAY, Assistant to the President, G.T.R. and G.T.P.R., was married at Montreal, Apr. 24, to Miss L. B. Eaton.

H. MARKLAND MOLSON, of Montreal, who was lost in the Titanic disaster, was a director of the Richelieu and Ontario Navigation Co.

E. F. FAUQUIER, railway contractor, who, with Mrs. Fauquier has been spending several months in the South, has returned to Ottawa.

R. TINNING, Travelling Freight Agent, G.T.R., Toronto, will retire May 1, under the provisions of the pension rules, after 50 years service.

F. L. WANKLYN, General Executive Assistant, C.P.R., Montreal, has been elected a director of the Guardian Accident and Guarantee Co.

K. W. BLACKWELL, Vice President, Canadian Steel Foundries, Ltd., Montreal, has been elected Vice President, Merchants Bank of Canada.

Sir DONALD and Lady MANN spent a week end with the Governor General and the Duchess of Connaught at Rideau Hall, Ottawa, early in April.

Sir RODOLPHE FORGET, Lady and Miss M. Forget, arrived in London, Eng., from Montreal, April 15. Sir Rodolphe went on to Paris the following day.

E. H. Keating, M. Can. Soc. C.E., formerly General Manager, Toronto Ry., was reported, May 25, to be slowly improving, after a serious illness.

Mrs. RENNELS, who died at Maitland, N.S., Mar. 27, was widow of W. Rennells, formerly Superintendent, Intercolonial Ry., Campbellton, N.B.

Miss Marian Creelman, daughter of A. R. CREELMAN, K.C., director and General Counsel, C.P.R., was married in Montreal, April 20, to E. B. Savage.

W. P. HINTON, General Passenger Agent, G.T. Pacific Ry., gave an address on the passenger department before the Railway Club at Winnipeg, April 8.

C. N. ARMSTRONG, who has been associated with various railway enterprises in Quebec, and Mrs. Armstrong, arrived in England from Montreal, Mar. 29.

The Governor-General will occupy Benvenuto, SIR WILLIAM MACKENZIE'S house, in Toronto, during the Ontario Jockey Club's spring meeting in May.

Capt. C. H. NICHOLSON, Manager, G.T. Pacific Coast Steamship Co., was presented with a fitted travelling bag by the Vancouver city council recently.

SIR WILLIAM WHYTE, director, C.P.R., Lady and Miss Whyte, returned to Winnipeg early in April from the Southern States, where they spent several weeks.

W. J. CROSSEN, President, Crossen Car Co., Ltd., and Mrs. Crossen, returned to Cobourg, Ont., early in April, after a few weeks' trip to the Southern States.

Mrs. Leonard, wife of J. W. LEONARD, Assistant to the Vice President, C.P.R., died in Montreal, Apr. 28, and was buried in Toronto.

SIR WM. and LADY MACKENZIE spent a week end at Rideau Hall, Ottawa, towards the end of April, as guests of the Duke and Duchess of Connaught.

R. B. ANGUS, director, C.P.R., has been granted a permit by the Montreal city council for a residence on Redpath Ave., to cost approximately $42,000.

Hon. G. P. GRAHAM, M.P., ex-Minister of Railways and Canals, spoke on the general subject of transportation at a meeting of the Canadian Club, Montreal, April 1.

J. F. DOLAN, City Passenger Agent, Richelieu and Ontario Navigation Co., Montreal, is recovering from the effects of a broken leg, followed by an attack of pneumonia.

T. WALMSLEY, insurance agent, etc., who died in Toronto recently, was associated with Sir Henry Pellatt in the pur-

P270 I. G. Ogden,
Vice President, Canadian Pacific Railway, after whom the company's shops, to be built, at Calgary, Alta., will be named.

chase of the Kent Northern Ry. in New Brunswick.

C. E. POOLEY, K.C., ex-M.P.P., who died in Victoria, B.C., recently was for many years solicitor for the Dunsmuir interests, including the Esquimalt and Nanaimo Ry.

G. HANNAH, Passenger Traffic Manager, Allan Line, gave an address on the romance of steam navigation before the Christ Church Cathedral Men's Club, Montreal, recently.

J. W. STEWART, of Foley, Welch and Stewart, who is recovering from his recent serious illness, at Pasadena, Cal., expected to leave there, April 30, for a year's European trip.

The Rev. H. J. Hamilton, of Nagoya, Japan, who has been elected Bishop of the Anglican diocese of Japan, is a brother of L. A. Hamilton, formerly Land Commissioner, C.P.R.

Sir Melbourne Tait, Chief Justice of Quebec, and father of SIR THOMAS TAIT, President, Fredericton and Grand Lake Ry. and Coal Co., has announced that he will retire during May.

W. HAMIL, coach shop foreman, Canadian Northern Ry. shops, Fort Rouge, Winnipeg, was presented with a purse of gold by the employes, Mar. 29, on his leaving the service.

H. L. JOHNSON, a division engineer of construction on the Canadian Northern Pacific Ry., had a narrow escape from drowning while skating on Kamloops Lake, B.C., recently.

E. N. BENDER, General Purchasing Agent, C.P.R., and Mrs. Bender, left Montreal early in April to spend about two months in Europe, in consequence of Mrs. Bender's ill health.

G. R. G. CONWAY, Chief Engineer, British Columbia Electric Ry., gave an address on famous tunnels under rivers before the National Electric Light Association at Vancouver recently.

J. S. SUTHERLAND, who was station agent at Aulac, N.S., on the Intercolonial Ry., from the time the line was opened until his retirement in 1900, died at Parrsboro, N.S., Mar. 30, aged 78.

P. R. TODD, Vice President, Bangor and Aroostook Rd., Bangor, Me., visited Ottawa, April 11. He was at one time assistant to E. J. Chamberlin, then General Manager, Canada Atlantic Ry.

Mrs. L. G. COLEMAN, wife of the Assistant Superintendent, G.T.R., at Belleville, Ont., is a sister of Thornton Davidson, son-in-law of C. M. Hays, both of whom were lost in the Titanic disaster.

Lady Tait, wife of Sir THOMAS TAIT, and her daughter, who spent the winter in Toronto, left there early in April for Watkins Glen, N.Y., where Lady Tait hopes to recuperate after a long illness.

Mrs. G. McL. BROWN, wife of the European Manager, C.P.R., London, Eng., visiting her mother, Mrs. Crearar, in Hamilton, Ont., during April, returning to England towards the end of the month.

H. O'SULLIVAN, M. Can. Soc. C.E., formerly Inspector of Surveys and Provincial Topographer, died at Indian Lorette, Que., recently, aged 66. He did considerable exploratory work for railways in that province.

JULES HONE, Jr., formerly C.P.R. ticket agent at Quebec, and latterly carrying on a general ticket and steamship agency, there and in Montreal, will, it is reported, shortly be appointed chief immigration agent at Quebec.

J. S. PYEATT, at one time Superintendent, Pere Marquette Rd., St. Thomas, Ont., was married to Miss M. Lay at St. Louis, Mo., recently. He is now Vice President and General Superintendent, Fort Worth, Texas.

C. R. MORGAN, G.T.R., city ticket agent, Hamilton, Ont., has joined the Canadian Ticket Agents' Association, of which his late father was a member for many years, occupying office on several occasions, including the presidency.

R. W. REFORD, Montreal, has subscribed $25,000 towards the $250,000 proposed to be raised for Anglican Church purposes in Montreal diocese, and promises to contribute a further $25,000 if the fund is made up to $500,000.

A. HAWKIN., who died in New York, April 10, aged 52, was the engineer who laid out and had charge of construction of the White Pass and Yukon Ry. He subsequently had charge of other railway construction work in Alaska.

F. L. SOMERVILLE, formerly District Engineer, G.T.R., Toronto, has been appointed to co-operate with the Hamilton, Ont., city engineer, to prepare a report on the proposed Canadian Northern Ontario Ry. entrance into the city.

C. A. FORSYTHE was presented with a cabinet of silver by the headquarters staff of the British Columbia Electric Ry. at Vancouver, April 13, on his retiring from the position of Chief Accountant to enter private practice.

R. J. MACKENZIE, of Mackenzie, Mann and Co.; H. SUTHERLAND, Executive Agent, Canadian Northern Ry.; J. WHALEN, President, Great Lakes Dredging Co., and F. S. WILEY, vessel owner, Port Arthur, are among the directors of the recently organized Stanley Mineral Springs and Brewing Co., Winnipeg.

W. S. KINNEAR, who has resigned as President, Kansas City Terminal Co., to become President, United States Realty and Construction Co., New York, was formerly Assistant Chief Engineer, Michigan Central Rd., and had charge of the construction of the Detroit River tunnel.

W. E. BELCHER, who was for many years connected with the C.P.R. Passenger Department in Toronto and Winnipeg, and until June, 1909, was General Agent, Freight Department, and subsequently, to 1910, Travelling Freight Representative, Northern Pacific Ry., Detroit, Mich., has returned to Winnipeg to take up his residence.

JAS. MCCBEE, who died at Lansing, Mich., recently, after some years spent in Canada, entered railway service in the United States, and was successively Trainmaster, Chicago and Port Huron Ry., and Superintendent, Port Huron and Western Ry. He had retired from active service for some years.

P. K. SEATH, of the Montreal Harbor Commissioners' staff, and son of D. Seath, Secretary to the Commission, was presented with a purse of gold by his associates, Apr. 9, on the occasion of his marriage, which took place on the following day.

A. WILLIAMS, Chief Dispatcher, C.P.R., was presented with a gold watch and chain and a travelling bag by the company's employes and other friends at Woodstock, N.B., on the occasion of his transfer to North Bay, Ont., as Assistant Superintendent.

C. H. GODFREY, Vice President and Secretary, Canadian Steel Foundries, Ltd., has been elected a member of the Montreal city board of control, to succeed F. L. Wanklyn, who resigned on his appointment as General Executive Assistant, C.P.R.

J. G. SKILLINGER, Division Engineer of Maintenance of Way, Cleveland, Cincinnati, Chicago and St. Louis Ry., at Galion, Ohio, has been appointed Chief Engineer of the Rutland Rd., at Rutland, Vt., succeeding J. C. Irwin, M. Am. Soc. C.E., resigned.

J. H. TAYLOR, General Superintendent, Great Northern Ry., Great Falls, Mont., has been transferred to Superior, Wis., succeeding D. M. Philbin, and C. O. Jenks, Division Superintendent at Great Falls, has been appointed General Superintendent, succeeding Mr. Taylor, at Great Falls.

J. MCLELLAN was presented with a purse of gold by the employes of the C.P.R. terminals at Winnipeg recently, on the occasion of the thirtieth anniversary of his entering C.P.R. service. He was in the employ of the Canadian Government during the construction of the St. Boniface-Emerson line.

A. SHIELDS was presented with a diamond ring by the Brotherhood of Locomotive Engineers between Port Arthur and Edmonton, and the Locomotive Firemen of Winnipeg, April 2, on his resigning the position of General Master Mechanic, Canadian Northern Ry., in order to enter private business in Winnipeg.

W. R. BAKER, C.V.O., Secretary, C.P.R., while the horse attached to a cab was running away, in Montreal, Apr. 2, jumped from the vehicle, and sustained serious injuries, including a wound on his head and a dislocation of the thigh. He was taken to the Royal Victoria Hospital, where he is likely to have to remain for some weeks.

J. P. MEAGHER, a nephew of Lady Mackenzie, died at Joliette, Que., Apr. 6, as a result of injuries sustained while attempting to board a moving locomotive. He had been in railway work for several years, latterly as roadmaster's clerk, Canadian Northern Quebec Ry., Joliette.

Mrs. R. W. Leonard, wife of R. W. LEONARD, Chairman of the National Transcontinental Railway Commission, has extended her offer to subscribe 10% of the total subscriptions for a women's residence in connection with Queen's University, Kingston, Ont., for another year.

A. SHIELDS, whose resignation of the position of General Master Mechanic, Canadian Northern Ry, Winnipeg, was announced in our last issue, has been elected President of the Railroaders Investment Co., there, the Vice President being W. R. Smith, until recently Superintendent of Works, Canadian Northern Ry.

A. S. GOODEVE, who has been appointed a member of the Board of Railway Commissioners, was born at Guelph, Ont., Dec. 15, 1860. He was mayor of Ross-

P271 The Late E. A. Hall,
President, Ottawa Forwarding Company.

land, B.C., 1899-1900, Provincial Secretary of B.C. in 1902, Provincial Forestry Commissioner in 1909, and up to the date of his present appointment has represented Kootenay in the Dominion Parliament.

D'ARCY TATE, who has been Solicitor to the Grand Trunk Pacific Ry., at Winnipeg, since its inception, has resigned, in order to devote his time to the Pacific Great Eastern Ry. Co., the incorporation of which was announced in our last issue, and of which he is Vice President and General Counsel. Prior to entering G.T.P.R. service, he was, from 1895, connected with the Toronto, Hamilton and Buffalo Ry. legal department.

E. H. WOOD, who has been appointed car foreman, Hochelaga shops, C.P.R., Montreal, was born at St. John, N.B., Dec. 30, 1880, and entered C.P.R. service, July 4, 1899, since when he has been, to Aug. 1, 1903, car repairer at St. John, N.B.; Aug. 1, 1903, to Jan. 31, 1904, car Inspector, St. John, N.B.; Feb. 1, 1904, to Jan. 24, 1911, car foreman, St. John, N.B.; Jan. 24, 1911, to Apr. 9, 1912, assistant car foreman, Hochelaga shops, Montreal.

C. B. MUTCHLER, who has been appointed Signal Engineer, Grand Trunk Pacific Ry., Winnipeg, was born at Pine Island, Minn., Mar. 8, 1879, and graduated from the University of Wisconsin in 1902, since when he has been, to 1904, engineer in the Bridge and Building Department, Chicago, Milwaukee and St. Paul Ry.; 1904 to 1910, in the Signal Department, same road; 1910 to Apr., 1912, engaged in signal and interlocking construction in Canada.

A. J. MCDONALD, Superintendent, City Division, Quebec Ry., Light and Power Co., Quebec, resigned recently to become General Superintendent, New Orleans, Southern and Grand Isle Ry., of which company, C. E. A. Carr is General Manager. After going to New Orleans, and looking the property over, he concluded that as the greater portion of the work was steam railway operation, with which he was not familiar, he would not undertake the duties, and he left New Orleans again, Apr. 14, for the north.

E. A. HALL, President, Ottawa Forwarding Co., who died in Ottawa, April 7, and whose portrait is published in this issue, was born in Montreal, June 19, 1853. He lived at L'Orignal, Ont., for a number of years, engaged in hay and grain business. In 1884, in partnership with his two brothers, W. J. and J. H. Hall, of Ottawa, he bought the steamboat Welshman, which was the beginning of the present Ottawa Forwarding Co. In later years he branched out, and at the time of his death was interested in a number of vessels trading on the Great Lakes, St. Lawrence River and Gulf of St. Lawrence.

W. E. WOLFENDEN, whose appointment as General Passenger Agent, Pere Marquette Rd., Detroit, Mich., was announced in our last issue, was born at Port Hope, Ont., Mar., 1862, and entered railway service in 1881, since when he has been, to 1883, operator, Chicago and West Michigan Ry., Woodville, Mich.; 1883 to 1890, agent, same road, New Richmond and Benton Harbor; 1890 to 1893, Travelling Passenger Agent, same road; 1893 to 1900, General Baggage Agent, same road and Detroit, Lansing and Northern Line; 1909 to 1904, District Passenger Agent, Pere Marquette Rd., Grand Rapids, Mich.; 1904 to Mar., 1912, General Western Passenger Agent, same road, Chicago, Ill.

C. BERESFORD FOX, M.A., M. Can. Soc. C.E., of Wragge and Fox, consulting engineers, etc., Toronto, died there, April 15. He was the eldest son of Francis Fox, who with his brother, Sir Douglas Fox, form the firm of Sir Douglas Fox and Partners, civil engineers, London, Eng. Mr. Fox had been a resident of Toronto for the past three years. Prior to going to Toronto, he had been engaged in many important engineering works, having passed some years in South Africa on the Rhodesian railways, and at the construction of the bridge over the Zambesi River at Victoria Falls. He was also engaged for about two years at the building of the Assouan barage on the Nile in Egypt, and for a time at the Simplon Tunnel.

T. MCHATTIE, who has been appointed Master Mechanic, Eastern Division, G.T.R., Montreal, and whose portrait appears in this issue, was born at Dufftown, Banffshire, Scotland, Aug. 8, 1854, and entered railway service, Oct., 1870, since when he has been consecutively to 1878 in locomotive shops, Great Western Ry., at Hamilton, Ont.; June, 1878, to Aug., 1886, locomotive engineer, same road; Aug., 1886, to Apr., 1889, locomotive foreman, G.T.R., Palmerston, Ont.; Apr., 1889, to Apr., 1898, General Foreman in charge of locomotives, same road, London, Ont.; Apr., 1898, to Jan., 1909, Master Mechanic, Eastern Division, same road, Montreal. Jan., 1909, to Apr., 1912, Superintendent of Motive Power and Car

Department, Central Vermont Ry.. St. ..lbans, Vt.

The following subscriptions have been made to the fund for the Victorian Order of Nurses, for which an appeal was recently made by the Duchess of Connaught:—SIR HENRY M. PELLATT, $5,000; SIR DONALD MANN, $2,500; R. B. ANGUS, $1,000; HUGH PATON, $500; SIR H. MONTAGU ALLAN, $500; R. W. REFORD, $100.

E. ELEY, who has been appointed Divisional Car Foreman, Lake Superior Division, C.P.R., North Bay, Ont., was born in London, Eng., in 1867, and commenced railway service with the Great Northern Ry., at King's Cross, London, Eng., June, 1888, and came to Canada in 1889. He entered C.P.R. service in the Bridge and Buildings Department, Mar., 1894, and was transferred to the Car Department, at North Bay, Ont., Aug., 1894, and was, from Mar., 1902, to Jan., 1903, charge hand at Chapleau, Ont.; 1903 to July, 1906, leading hand at North Bay, Ont.; July, 1906, to Feb., 1907, Car Foreman at Quebec; Feb., 1907, to May, 1911, Car Foreman at Glen Yard, Montreal; May, 1911, to Apr., 1912, General Foreman, passenger car repair shops. West Toronto, Ont.

G. C. CONN, whose appointment as Vice President, Pere Marquette Rd., was announced in our last issue, was born at Woburn, Mass., July 1, 1867, and entered railway service, Oct. 1, 1884, in the general freight department of the Boston and Lowell Rd., and was, later, to 1888, with the Boston and Maine Rd.. since when he has been, 1888 to 1890, Travelling Freight Agent, Pennsylvania Rd.; 1890 to 1897, Travelling Agent, Canadian Pacific Despatch; 1897 to 1900. Commercial Agent, Flint and Pere Marquette Rd., Minneapolis, Minn.; 1900 to 1904, General Agent and Assistant General Freight Agent, Pere Marquette Rd.. Milwaukee, Wis.; 1904 to 1909, General Freight Agent, Minneapolis, St. Paul and Sault Ste. Marie Ry.; 1909 to Mar. 7. 1912, Freight Traffic Agent. Pere Marquette Rd.

I. G. OGDEN, Vice President, C.P.R., in charge of Financial and Accounting Departments, in whose honor the company's new shops at Maharg, near Calgary, Alta., are to be named the Ogden shops, and whose portrait appears in this issue, was born at New York, Oct. 10, 1844, and entered railway service, Mar., 1871, since when he has been, consecutively, to 1876, Paymaster and Accountant, Chicago and Pacific Ry.; 1876 to Mar., 1881, Auditor, under receiver, same road; Mar., 1881, to July, 1883, Auditor, C.P.R. Western Division, Winnipeg; July, 1883, to June, 1887, Auditor, same road, Montreal; Dec., 1901, to June, 1910, Comptroller, same road, Montreal; Dec., 1910, to June, 1910, Third Vice President, same road, Montreal, at which latter date, the numerical designations of the Vice Presidents were abolished.

SIR MAURICE FITZMAURICE, M. Am.. M. Eng., M. Can. Soc., C.E., who received his recent knighthood in recognition of his having been engineer in charge of the construction of the stone embankment that lines the river frontage of the new London County Council hall in London, Eng., the foundation stone of which was laid by the King recently, was one of the original board of engineers appointed by the late Dominion Government for the construction of the Quebec bridge, after the collapse of the completed portion of the first structure. He has been Chief Engineer to the London County Council since 1901, and has been associated with many important works, including the Rotherhithe and Blackwall tunnels, the new Vauxhall bridge, Kingsway, and the tram subway in London. He was formerly engaged on the Forth bridge and the Assuan dam.

E. W. DUVAL, who has been appointed Superintendent, District 4, Manitoba Division, C.P.R., Souris, was born at Toledo, Ohio, June 5, 1885, and entered railway service July 1, 1902, since when he has been, to June 1, 1905, in Superintendent's office, Canadian Northern Ry.. Winnipeg, and at Port Arthur, Ont.; June 1, 1905, to Jan. 2, 1911, successively, secretary to General Superintendent, Central Division, C.P.R., Winnipeg. chief clerk to Superintendent, District 2, Central Division, C.P.R., Winnipeg; assistant chief clerk to General Superintendent, Central Division, C.P.R., Winnipeg; chief clerk to General Superintendent, Western Division, C.P.R., Calgary, Alta.; chief clerk to Assistant General Manager, and later to General Manager, Western Lines, C.P.R., Winnipeg; and Trainmaster, C.P.R. Terminals, Calgary, Alta.; Jan. 2, 1911, to Apr. 6, 1912, Superintendent, District 1, Saskatchewan Division, Moose Jaw.

R. E. MERKELEY, whose appointment as Trainmaster, District 3, Manitoba Division, C.P.R.. Brandon, was announced in our last issue, was born at Ottawa, Sept. 3, 1882, and entered railway service, May, 1899, since when he has been, to May, 1901, timekeeper on construction, Ottawa Northern and Western Ry.; May, 1901, to June, 1903, freight clerk, Canada Atlantic Ry., Depot Harbor, Ont.; Jan.. 1903, to Apr. 14, 1904, switchman, Union Pacific Rd., Denver, Col.; Apr. 14 to Sept. 15, 1904, chief statistical clerk, Canadian Northern Ry., Winnipeg; Sept. 15, 1904, to July 1, 1906, brakeman and switchman. C.P.R., Kenora, Ont., and Farnham, Que., July 1, 1906, to Oct. 18, 1909, Travelling Agent, Car Service Department, Canadian Northern Ry., Winnipeg; Oct., 18, 1909. to May 12, 1910, chief clerk, Winnipeg Terminals, Canadian Northern Ry.; May 12 to Aug. 1, 1910, car tracer, C.P.R., Calgary, Alta.; Aug. 1 to Sept. 15, 1910, chief clerk, Car Service Agent's office, C.P.R., Moose Jaw, Sask.; Sept. 15, 1910, to Feb. 25, 1912, Travelling Car Service Agent, Western Lines, C.P.R., Winnipeg.

F. F. BUSTEED, M. Can. Soc. C.E., who has been appointed Engineer in charge of C.P.R. revision and double tracking, west of Calgary, Alta., Kamloops, B.C., was born at Battery Point, Que., Oct. 10, 1858, and entered railway service in 1879, since when he was, to 1881, rodman; 1881 to 1883, transitman; 1883 to 1887, assistant engineer in charge of construction, 1887 to 1889, in charge of location, and Division Engineer of Construction, C.P.R.; 1890, locating and Division Engineer of Construction, Alberta Ry. and Coal Co.'s extension from Lethbridge, Alta., to a junction with the Great Falls and Canada Ry. at the International boundary; 1890 to 1892, locating engineer and city engineer, Bristol, West Virginia; 1892 to July, 1904, successively, Roadmaster, Assistant Engineer, Resident Engineer, Engineer of Maintenance of Way and Structures, Division Engineer, Superintendent at Nelson, B.C., all with C.P.R.; July, 1904, to Feb., 1907, Assistant Chief Engineer, Western Lines, C.P.R., Winnipeg; Feb., 1907, to June, 1910, General Superintendent, Pacific Division, C.P.R., Vancouver, B.C.; June, 1910, to Jan., 1912, General Superintendent, British Columbia Division, C.P.R., Vancouver.

E. P. GOODWIN, whose appointment as Inspecting Engineer, National Transcontinental Ry., Ottawa, was announced in our last issue, was born at Baie Verte, N.B., Mar. 17, 1865, and educated at Mount Allison University, Sackville, N.B., and Queen's University, Kingston, Ont. He commenced railway work in 1887, as chainman on the C.P.R., and from 1888 to 1893 was inspector and assistant engineer, Department of Public Works; 1894, provincial land surveyor; 1895, transitman on survey, Kingston, Smiths Falls and Ottawa; Oct., 1895, to Dec., 1896, Resident Engineer, St. Lawrence and Adirondack Ry., 1897. Resident Engineer, Missiquash Marsh Co.; 1898 to 1899, Resident Engineer and Division Engineer, Midland Ry. of Nova Scotia; 1900, Resident Engineer, Dominion Iron and Steel Co.; Jan. to Aug.. 1901, in charge of location party, Nova Scotia Eastern Ry.; Aug., 1901, to Feb., 1903, in charge of party and Division Engineer, Cape Breton Ry.; Mar., 1903, to Dec., 1904, Chief Engineer, Nova Scotia Eastern Ry.. Jan. to Mar., 1905, in charge of party, Canadian Northern Ry.; Mar., 1906, took charge of survey party, National Transcontinental Ry., and became Division Engineer when surveys were completed. He has been connected with the militia since 1881, and is captain in the Corps of Guides.

J. J. SCULLY, who has been appointed General Superintendent, Lake Superior Division, C.P.R., North Bay, Ont., was born at Montreal, Feb. 3, 1872, and entered C.P.R. service Jan., 1887, since when he has been, to June, 1888, in Car Service Department, Montreal; June to Sept., 1888, clerk in Superintendent's office, Farnham, Que., Sept. 1888, to Aug., 1890, chief clerk and car distributor, Farnham, Que.; Aug., 1890, to Apr., 1891, in Superintendent's office, Montreal; Apr., 1891, to Mar., 1893, in Superintendent's office, Farnham, Que.; Mar., 1893, to Sept., 1894, in Mechanical Department Farnham, Que.; Sept, 1894, to Mar., 1898, in Mechanical Department, Toronto, during which period the mechanical departments of the lines east and west of Montreal were consolidated; Mar., 1898, to Aug., 1901, Assistant Master Mechanic, Ontario and Quebec Division, Toronto; Aug., 1901, to Aug., 1902, Assistant Master Mechanic, Western Division, for roadwork, Winnipeg; Aug., 1902, to May, 1903, assistant to General Superintendent, Central Division, Winnipeg; May to June, 1903, in office of Assistant General Manager, lines east of Port Arthur, Ont., Winnipeg; June, 1903, to Nov., 1906, Superintendent Brandon, Man.; for a short period he was Superintendent at Fort William, Ont., and from Nov., 1906, to May, 1910, Superintendent, Moose Jaw, Sask., and from June, 1910, to Apr., 1912, General Superintendent, Saskatchewan Division, Moose Jaw.

S. P. BROWN, M. Am. Soc. C.E. and M. Am. Soc. M.E., who has been appointed Chief Engineer, Montreal Tunnel and Terminal Co., and Managing Engineer, Montreal tunnel and terminal construction, Mackenzie, Mann and Co., Ltd., Montreal, and whose portrait appears in this issue, was born at Dover, Me., Apr. 29, 1877, and graduated from the Massachusetts Institute of Technology, Boston, in 1900, upon which he entered, as a junior member, the firm of Collier and Brown, consulting engineers, Atlanta, Ga. He was, from 1904 to 1905, on the Bridgeport elevation and station con-Hartford, New York, New Haven and Hartford Ry., and in 1905 entered the service of the United Engineering and Contracting Co., first on the Port Morris depression works, New York Central Ry., then on the St. Marys Park tunnel, and later as consulting engineer in the study of public utilities. San Juan, Porto Rico. Following this he was Chief Assistant Engineer, same company, on the cross town tunnels of the Pennsylvania Rd. in New York, where he had direct charge of all concrete and construction work, taking general charge later of all work west of Fifth Ave. In 1908-09 he was, in addition to being Chief Assistant Engineer, United Engineering and Contracting Co., designing engineer, Cuban Engineering and Contracting Co., and spent the summers of both years in Europe investigating European tunnel methods and studying hydro-electric construction. From 1909 to 1912 he was Chief Engineer, Tidewater Building Co.. and T. B. Bryson, on sec. 11-A-3 of the Fourth Ave. Rapid Transit subway, Broklyn, N.Y.

Transportation Appointments Throughout Canada.

The information under this head, which is almost entirely gathered from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who may notice any error in our announcements will confer a favor by advising us.

Alberta Interurban Ry—K. J. C. ZINCK, heretofore Assistant Engineer, Grand Trunk Pacific Ry., Winnipeg, has been appointed Chief Engineer, A.I.R. Office, Calgary, Alta.

E. P. NEWHALL, formerly Superintendent, Pacific Express Co., Toledo, Ohio, has been appointed General Freight and Passenger Agent, A.I.R. Office, Calgary, Alta.

Board of Railway Commissioners.—A. S. GOODEVE, M.P. for Kootenay, B.C., has been appointed a member of the board, in place of the late Thos. Greenway, who died in 1908, a few weeks after his appointment.

Canadian Express Co.—John Pullen, President, issued the following circular, April 1.—JAMES BRYCE, Vice President and Manager, who for nearly 40 years has devoted himself unremittingly to the best interests of the company, retires this day under the provisions of the pension rules. The office of Vice President and Manager is abolished.

Canadian Northern Ontario Ry.—A. J. ISBESTER, heretofore Division Engineer, Port Arthur District. Office, Port Arthur, Ont.

H. C. NELSON and R. C. KEITH have been appointed Division Engineers, Division F., Port Arthur District.

Canadian Northern Ry.—G. EASSON, heretofore rate clerk, General Freight Agent's office, Toronto, has been appointed Travelling Freight Agent, Toronto, vice I. L. Healey, resigned.

H. A. ENGLISH has been appointed Locomotive Inspector, with supervision of the examination of enginemen, reporting to the Superintendent of Rolling Stock. Office, Winnipeg.

Canadian Northern Montreal Tunnel and Terminal Co.—S. P. BROWN, M. Am. Soc. C.E., and M. Am. Soc. M.E., has been appointed Chief Engineer. He has also been appointed Managing Engineer, Montreal Tunnel and Terminal Construction, Mackenzie, Mann and Co., Ltd.

J. C. K. STUART, heretofore on Canadian Northern Ry. surveys, has been appointed in charge of field work in connection with the Montreal tunnel construction.

Canadian Pacific Ry.—W. B. HOWARD, District Passenger Agent, St. John, N.B., has also been appointed General Agent, Atlantic Steamship Lines, there.

T. HARRIS, heretofore Divisional Car Foreman, Lake Superior Division, North Bay, Ont., has been appointed Car Foreman at St. John, N.B., vice A. G. Longeway, resigned.

I. B. MERRIMAN, heretofore dispatcher, has been appointed Chief Dispatcher, District 2, Atlantic Division, vice A. Williams, transferred. Office, Woodstock, N.B.

R. F. GAULD, heretofore clerk in charge of auditing pay rolls in the Audit Department, has been appointed Auditor of Pay Rolls. This appointment gives him a title, but does not materially change his duties. Office, Montreal.

F. TAYLOR, heretofore Division Engineer, Lake Superior Division, North Bay, Ont., has been appointed Division Engineer, Eastern Division, vice C. B. Brown, promoted. Office, Montreal.

W. WEBBER, heretofore Passenger Agent, Atlantic Steamship Lines, Montreal, has been appointed General Agent, same department. Office, Montreal.

E. H. WOOD has been appointed Car Foreman, Hochelaga shops, Montreal, vice F. E. Warren, promoted.

H. E. STEWART, heretofore chief clerk in office of assistant to Vice President, has been appointed Assistant Superintendent, District 4, Eastern Division, vice J. H. Boyle, who is acting Superintendent, during the absence of H. B. Spencer, on leave. Office, Ottawa.

W. CORBETT, heretofore Travelling Passenger Agent, has been appointed Terminal Passenger Agent, in charge of passenger travel and matters pertaining to the Passenger Department at Toronto terminals.

R. CUNNINGHAM, heretofore chief clerk, Freight Department, Owen Sound, Ont., is reported to have been appointed station agent there, vice J. L. Simpson, transferred.

J. L. SIMPSON, heretofore station agent, Owen Sound, Ont., is reported to have been appointed station agent, Port McNicoll, Ont.

J. J. SCULLY, heretofore General Superintendent, Saskatchewan Division, Moose Jaw, has been appointed General Superintendent, Lake Superior Division, vice J. G. Taylor, transferred. Office, North Bay, Ont.

A. WILLIAMS, heretofore Chief Dispatcher, District 1, Atlantic Division, Woodstock, N.B., has been appointed Assistant Superintendent, District 1, Lake Superior Division, vice P. G. Cromar, transferred. Office, North Bay, Ont.

S. P. Brown, M. Am. Soc. C.E., Chief Engineer, Canadian Northern Montreal Tunnel and Terminal Company.

E. ELEY, heretofore General Passenger Car Repair shop, West Toronto, has been appointed Divisional Car Foreman, Lake Superior Division, vice T. Harris, transferred to Atlantic Division. Office, North Bay, Ont.

J. J. ANDERSON, heretofore Travelling Passenger Agent, North Bay, Ont., has been appointed Travelling Passenger Agent, Toronto, vice W. Corbett, transferred.

P. G. CROMAR, heretofore Assistant SuperintendentD strict 1, Lake Superior Division, North Bay, Ont., has been appointed Assistant Superintendent, District 2, Lake Superior Division, vice E. J. Brien, Trainmaster, transferred. Office, Schreiber, Ont.

E. J. BRIEN, heretofore Trainmaster Schreiber, Ont., has been appointed Assistant Superintendent, District 2, Lake Superior Division, vice W. Bartlett, transferred. Office, Chapleau, Ont.

A. J. WOLFE has been appointed Roadmaster, White River subdivision, Lake Superior Division, vice C. Erickson, transferred. Headquarters, White River, Ont.

D. C. CHISHOLM, heretofore acting Resident Engineer, Winnipeg, has been appointed Resident Engineer, Fort William terminals.

C. S. MORSE, heretofore Travelling Freight Agent, Lethbridge, Alta., has been appointed District Freight Agent at Fort William, Ont.

D. C. COLEMAN, as announced in our March issue, was on Feb. 14 appointed acting General Superintendent, Manitoba Division. On Mar. 25, F. F. BUSTEED, M. Can. Soc. C.E., was appointed General Superintendent, Manitoba Division. On Apr. 1, D. C. COLEMAN was appointed General Superintendent, Manitoba Division, and F. F. BUSTEED was appointed Engineer in charge of grade revision and double tracking, Calgary and west, with office at Kamloops, B.C. He has also been given authority to issue time checks.

T. R. FLETT, heretofore Superintendent, District 4, Manitoba Division, Souris, has been appointed Superintendent, District 2, vice A. E. Stevens, transferred. Office, Winnipeg.

FRANK LEE, heretofore Division Engineer, Manitoba Division, has been appointed Principal Assistant Engineer, Western Lines. Office, Winnipeg.

R. C. ST. JOHN has been appointed Engineer of Maintenance of Way, Western Lines. Office, Winnipeg.

J. C. HOLDEN, heretofore Assistant Engineer, Winnipeg, has been appointed Engineer, Manitoba Division, vice F. Lee, promoted. Office, Winnipeg.

C. H. FOX, heretofore Resident Engineer, Fort William, Ont., has been appointed Assistant Division Engineer, Manitoba Division. Office, Winnipeg.

C. G. WASHBON, heretofore instrument man, Brandon, Man., has been appointed acting Resident Engineer, Winnipeg, Man., vice D. C. Chisholm, transferred.

A. HATTON, heretofore acting Superintendent of Car Service, Western Lines, has been confirmed in the position. Office, Winnipeg.

E. W. DUVAL, heretofore Superintendent, District 1, Saskatchewan Division, Moose Jaw, has been appointed Superintendent, District 4, Manitoba Division, vice T. R. Flett, transferred. Office, Souris.

R. K. SCARLETT, heetofore City Ticket Agent, Nelson, B.C., has been appointed City Ticket Agent at Regina, Sask., a new office, which will be opened at 1812 Scarth St., about May 20.

A. C. FRASER, heretofore Inspector of Telegraphs, District 1, Saskatchewan Division, Moose Jaw, has been appointed Inspector of Telegraphs, District 2, Saskatchewan Division, vice S. M. Thurston, transferred. Office, Regina.

J. G. TAYLOR, heretofore General Superintendent, Lake Superior Division, North Bay, Ont., has been appointed General Superintendent, Saskatchewan Division, vice J. J. Scully, transferred. Office, Moose Jaw.

A. E. STEVENS, heretofore Superintendent, District 2, Manitoba Division, Winnipeg, has been appointed Superintendent, District 1, Saskatchewan Division, vice E. W. DuVal, transferred. Office, Moose Jaw.

W. MCPHERSON, heretofore night foreman, Moose Jaw, ask., has been appointed Locomotive Foreman, there, vice W. Jordan, who has left the service. G. Motta, who was Locomotive Foreman, Moose Jaw, up to Feb. 10, has returned to the shops as a fitter.

T. S. BARTRAM has been appointed night locomotive foreman at Moose Jaw, Sask., vice W. G. McPherson, promoted.

S. M. THURSTON, heretofore Inspector of Telegraphs, District 2, Saskatchewan Division, Regina, has been appointed Circuit Manager at Moose Jaw, Sask.

C. K. BROWN has been appointed Inspector of Telegraphs, District 1, Sas-

katchewan Division, vice A. C. Fraser, transferred. Office, Moose Jaw.

A. C. HARSHAW, heretofore Trainmaster, Macleod, Alta., has been appointed Terminal Trainmaster in charge of maintenance and operation, Calgary, Alta., vice C. Hood, transferred.

L. A. HUTTON has been appointed Inspector of Telegraphs, District 2, Alberta Division, vice C. H. Powell, transferred. Office, Calgary.

J. J. SCHETGEN, heretofore Inspector of Telegraphs, District 1, Alberta Division, Medicine Hat, has been appointed chief operator, Telegraph Department, at Calgary, Alta.

J. L. DOUPE, General Townsite Agent, Department of Natural Resources, Calgary, Alta., has resigned.

C. H. POWELL, heretofore Inspector of Telegraphs, District 2, Alberta Division, Calgary, has been appointed Inspector of Telegraphs, District 1, Alberta Division, vice J. J. Schetgen, transferred. Office, Medicine Hat.

J. D. WATSON has been appointed District Master Mechanic, Saskatoon, Sask., vice J. P. McAnany, transferred to Revelstoke, B.C., as announced in our last issue.

D. SMEATON, heretofore senior ticket agent, Winnipeg station, has been appointed City Ticket Agent, Nelson, B.C., vice R. K. Scarlett, transferred to Regina, Sask.

F. R. PERRY, District Passenger Agent, Boston, Mass., has also been appointed General Agent, Atlantic Steamship Lines, there.

W. H. SNELL, Eastern Passenger Agent, New York, has also been appointed General Agent, Atlantic Steamship Lines, there.

J. J. FORSTER, heretofore Travelling Passenger Agent, Atlantic Steamship Lines, Seattle, Wash., has been appointed General Agent, same department, with jurisdiction over British Columbia, Oregon and Washington. Office, Seattle, Wash.

A. A. POLHAMUS, General Agent Passenger Department, Los Angeles, Cal., has also been appointed General Agent, Atlantic Steamship Lines, there.

G. M. JACKSON, General Agent Passenger Department, San Francisco, Cal., has also been appointed General Agent, Atlantic Steamship Lines, there.

Central Vermont Ry.—J. E. FITZSIMONS, heretofore Road Foreman of Locomotives, was on Apr. 1, appointed acting Superintendent of Motive Power and Car Department, vice T. McHattie, resigned, and on Apr. 22 was appointed acting Superintendent of Motive Power, devoting his entire time to the Motive Power Department.

W. GILLESPIE has been appointed Master Car Builder. Office, St. Albans, Vt.

H. G. BELL has been appointed acting Road Foreman of Locomotives, vice J. E. Fitzsimons, promoted. Headquarters, St. Albans, Vt.

Duluth, Winnipeg and Pacific Ry.—J. L. PICKLES, heretofore Chief Engineer and Superintendent, Shannon-Arizona Ry., Clifton, Ariz., has been appointed Assistant District Engineer, D.W. and P. Ry. Office, Duluth, Minn.

Grand Trunk Pacific Ry.—E. J. CHAMBERLIN, Vice President and General Manager, has been placed, temporarily, in charge of all the company's affairs, consequent on the death of the President, C. M. Hays.

C. B. MUTCHLER has been appointed Signal Engineer, with jurisdiction over the line west of Fort William, Ont., including branch lines. Office, Winnipeg.

E. MCDONALD, heretofore chief clerk in charge of Baggage Department, Winnipeg, has been appointed District Baggage Agent, with territory, Fort William, Ont., and west. Correspondence formerly addressed to the General Baggage Agent there, is now addressed to the District Baggage Agent. Office, Winnipeg.

F. E. CORRIGAN, heretofore Locomotive Foreman, Fitzhugh, Alta., has resumed his former position as leading hand at Rivers, Man.

C. R. HEATH has been appointed Superintendent of Water Service, with territory from Winnipeg to Edmonton, including branch lines. Office, Melville, Sask.

J. A. HEAMAN has been appointed Division Engineer, vice John Callaghan, resigned. Office, Fitzhugh, Alta.

E. L. GREEN and J. F. HARRINGTON have been appointed agents at Stony Plain and Wabamun, Alta., respectively.

W. E. DUPEROW, heretofore City Passenger and Ticket Agent, Vancouver, B. C., has been appointed General Agent, Passenger Department, in charge of territory in British Columbia, Rivers Inlet and south. Office, Vancouver.

C. F. EARLE, heretofore assistant City Passenger and Ticket Agent, Vancouver, B.C., has been appointed City Passenger and Ticket Agent, there, vice W. E. Duperow, promoted.

Grand Trunk Ry.—W. WAINWRIGHT, Senior Vice President, has been placed

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F. F. Busteed, M. Can. Soc. C.E., Engineer in charge of C.P.R grade revision and double tracking, west of Calgary, Alta.

temporarily in charge of all the company's affairs, consequent on the death of the President, C. M. Hays.

T. MCHATTIE, heretofore Superintendent of Motive Power, Central Vermont Ry., St. Albans, Vt., has been appointed Master Mechanic Eastern Division, G.T.R., vice J. Duguid, assigned to other duties. Office, Montreal.

L. HAROLD, heretofore station agent, London, Ont., has been appointed Assistant Trainmaster, Hamilton, Ont., vice C. H. Brown, resigned to enter another company's service.

D. W. HAYES, heretofore agent at Guelph, Ont., has been appointed agent at London, Ont., vice L. Harold, promoted.

H. V. GOODWIN, heretofore operator, has been appointed agent at Goldstone, Ont., vice J. M. Fairweather, transferred.

J. M. FAIRWEATHER, heretofore agent at Goldstone, Ont., has been appointed agent at Neustadt, Ont., vice C. E. Brigham, transferred.

C. E. BRIGHAM, heretofore agent at Neustadt, Ont., has been appointed agent at Paisley, Ont., vice W. F. Briggs, transferred.

W. F. BRIGGS, heretofore agent at Paisley, Ont., has been appointed agent at Guelph, Ont., vice D. W. Hayes, transferred.

The following agents have been appointed:—Levis, Que., pass., A. J. Roy; Nottawa and Glen Huron, Ont., L. A. Hill; London East, Ont., J. M. Little; Hamilton, Ont., King St. pass., J. W Vanatter; Jordan, Ont., W. J. Meredith; Ingersoll, Ont., A. H. King; Burford, Ont., N. A. McCallum; Denfield, Ont., H. W. Millar; Hensall, Ont., A. L. Case; Walkerville and Windsor, Ont., S. V. Beck; Barry's Bay, Ont., F. O. Parent; Port Huron, Mich., C. F. Percival; Stratford, Ont., outside, Deacon and Trow.

Intercolonial Ry—F. FONTAINE has been appointed acting Car Foreman, Chaudiere Jct., Que., vice S. Malouin, deceased.

J. LEMELIN has been appointed acting Roundhouse Foreman at Chaudiere Jct., vice J. E. Levasseur, resigned.

Midland Ry. of Manitoba.—C. H. BOOTH, heretofore assistant local freight agent, C.N.R., Winnipeg has been appointed local freight agent, M.R. of M., Winnipeg.

National Transcontinental Ry—G. S. HODGINS a native of Toronto, and until recently engaged in technical journalism in the United States, has been appointed Consulting Mechanical Engineer, to make a special report concerning the shops and equipment of the various roundhouses, terminal shops, etc., either built or under construction on the line, which will occupy him for some months. He will have his headquarters at Ottawa.

New York Central and Hudson River Ry.—A. T. HARDIN, heretofore Assistant General Manager, has been appointed Assistant Vice President. Office, New York.

P. E. CROWLEY, heretofore Assistant General Manager, has been appointed General Manager. Office, New York.

H. L. INGERSOLL has been appointed Assistant General Manager, performing duties assigned. Office, New York.

W. J. FRIPP, heretofore General Superintendent, Eastern Division, Albany, N. Y., has been appointed Assistant General Manager. Office, Albany, N.Y.

New York Central Lines.—A. H. SMITH, heretofore Vice President and General Manager, N.Y.C., and H. R. Rd., has, while retaining the Vice Presidency of that road, also been appointed Vice President in charge of operation, maintenance and construction, Lake Shore and Michigan Southern, Cleveland, Cincinnati, Chicago and St. Louis, Peoria and Eastern, Toledo and Ohio Central, and Zanesville and Western Rys., Lake Erie and Western, Lake Erie, Alliance and Wheeling, Cincinnati Northern, Michigan Central, and Chicago, Indiana and Southern Rds., vice C. E. Schaff, resigned. Office, New York.

Northern Navigation Co.—PETER PATON, heretofore Travelling Western Representative, Winnipeg, has been appointed Assistant to the President. Office, Sarnia, Ont.

Northern Pacific Ry.—J. M. MAVER has been appointed Contracting Agent, at Montreal, vice Tracey Howard, promoted.

Pacific Great Eastern Ry.—D'ARCY TATE, heretofore Solicitor, Grand Trunk Pacific Ry., Winnipeg, has been appointed Vice President and General Counsel. P.G.E. Ry.

JOHN CALLAGHAN, heretofore Division Engineer, Grand Trunk Pacific Ry., has been appointed Chief Engineer, P.G.E. Ry.

Pere Marquette Rd.—NEWMAN ERB, D. E. WATERS and F. W. BLAIR, having been appointed receivers by the U.S. district court for the eastern district of Michigan, and having duly qualified, have appointed W. COTTER, General Manager, J. L. CRAMER, Comptroller and J. E HOWARD, Treasurer, for the receivers. All

other officers and agents of the operating, traffic and accounting departments in the service of the company at the time of the appointment of the receivers, are continued in their respective positions, until otherwise ordered.

Quebec Ry., Light, Heat and Power Co.—A. H. N. BRUCE, M. Can. Soc. C.E., Chief Engineer, Quebec and Saguenay Ry., has also been appointed Chief Engineer of the Q.R.L.H. and P. Co., and of all other railways controlled by Sir Rodolphe Forget and associates.

Quebec and Saguenay Ry.—E. A. Evans, M. Can. Soc. C.E., having resigned as Consulting Engineer, HON. J. P. B. CASGRAIN, Q.L.S., A.M. Can. Soc. C.E., has been appointed Consulting Engineer.

Roberval-Saguenay Ry.—J. E. ROBITAILLE, Accountant and Auditor, Ha Ha Bay Ry., has also been appointed Treasurer, Roberval-Saguenay Ry., in charge of the Accounting Department. Office, Chicoutimi, Que.

Southern Ry—G. W. CARTER is reported to have been appointed Travelling Passenger Agent at Montreal.

Temiskaming and Northern Ontario Ry.—W. BLACK has been appointed General Foreman, North Bay, Ont., vice A. J. Roberts.

Toronto, Hamilton and Buffalo Ry.—H. H. ADAMS, General Manager, is reported to have resigned, to accept the Presidency of the Kansas City Terminal Ry., Kansas City, Mo., vice W. S. Kinnear, resigned.

H. T. MALCOLMSON has been appointed Car Accountant, vice G. W. Wilson, resigned. Office, Hamilton, Ont.

Wabash Rd.—W. BOCKSTAHLER, heretofore Contracting Freight Agent, Detroit, Mich., has been appointed Travelling Freight Agent, Buffalo, N.Y., vice W. N. Price, promoted.

W. N. PRICE, heretofore District Freight Agent, Buffalo, N.Y., has been appointed General Agent, San Francisco, Cal., vice Z. T. George, resigned.

Cancellation of Central Ry. Co. of Canada's Ontario Land Grant.

The Ontario Legislature has passed an act respecting land grants to railways, which affects the claims of the Central Ry. Co. of Canada to participate in the grant made by chap. 112, of the act of 19 and 20 Vict., passed by the old Legislature of Canada, for aiding the building of a railway from Lake Huron to Quebec. The preamble to the act sets forth that the Canada Central Ry. was incorporated by chap. 80, 24 Vict., to take advantage of the 4,000,000 acres granted by the first-mentioned act, and that with the exception of the section of the line between Carleton Jct. and Ottawa—built prior to 1870, and which now forms part of the C.P.R., and in respect of which full and satisfactory settlement was made by the province—no part of the line has been built. Since the passing of the acts, continues the preamble, other lines have been built; serving the territory through which the projected line was to pass, and which lines have been aided by grants from the Ontario Legislature, as well as from the Dominion Parliament. It is enacted that "no person or company should be entitled to or receive a grant of land . . . out of any lands . . . reserved by any act or acts of the Parliament of the late Province of Ontario . . . for the purpose of aiding or encouraging the construction of a railway or railways."

Application is being made for the incorporation of the Vancouver Monorail Co., to build a monorail line in Vancouver City W. M. Shepard and M. Cameron, Seattle, Wash., are provisional directors.

Grand Trunk Railway Betterments, Construction Etc.

Back Cove Bridge, Portland, Me.—We are advised that a contract has been let to the John S. Metcalf Co., Ltd., Montreal, for building the rest piers for the new swing bridge at Back Cove, Portland, Me. Double walled caissons, open type, will be used, the piers being of concrete.

Southern New England Ry.—The Massachusetts Legislature has ordered the preparation of a bill granting the necessary permission to the company to enter Boston. The Legislature further directed that the bill should contain a provision extending to all railways in the state the privilege thus granted to the S.N.E.R.

The Rhode Island Legislature has granted the G.T.R.'s application, through the S.N.E.R., for a lease of part of the state's new docks at Providence. The lease will be for 20 years. The Legislature also authorized the expenditure of $1,000,000 upon the completion of the docks.

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T. McHattie,
Master Mechanic, Eastern Division, Grand Trunk Railway.

Central Vermont Ry.—We are officially advised that press reports to the effect that the C.V.R. had under consideration plans for the electrification of its line and connections between Montreal, Que., and Providence, R.I., are in error. The only statement made by the management on the subject of electrification of lines is that the company will be ready to electrify the line to Boston, Mass., for the building of which legislative authority is being asked, as soon as the other lines entering that city are electrified.

The original counterpart no. 6 of the agreement and conditional sale between Blair and Co., the Central Vermont Ry., and the Bankers Trust Co., series D, dated Feb. 23, has been filed with the Secretary of State at Ottawa.

Lachine Bridge, Montreal. — The bridge across the Lachine canal at Wellington St., Montreal, is being rebuilt. It is situated on the branch line connecting the G.T.R. Point St. Charles yard with the Montreal harbor tracks. The new span consists of a 257 ft. single track equal arm skew and draw, with run bearing centres. It will be erected on the existing masonry seats and pivot pier, and will be electrically operated. The old bridge was designed for engine driving axle loading of 24,000 lbs., while the new bridge is designed for engine driving axle loading of 50,000 lbs. The Dominion Bridge Co., which built the old structure in 1893, is putting up the new bridge.

Lachine, Jacques Cartier and Maisonneuve Ry.—We are officially advised that the length of this projected line is seven miles. It starts from St. Laurent on the Jacques Cartier Union Ry., and goes round Mount Royal, past the C.P.R. Angus shops, down to the terminal on St. Catherine St., between Harbor and Frontenac Streets, opposite the gas works. The construction is heavy, being practically all track elevation. The Board of Railway Commissioners has authorized the company to carry its line across the Montreal St. Ry., at three points by means of overhead bridges. It is expected that construction of the line will be started this year.

Bridge at Rockfield, Montreal.—A new highway bridge is being built over the G.T.R. and the Montreal Park and Island Ry. at Rockfield, Montreal, to replace the present level crossing. The cost is being met by the G.T.R., the Montreal Tramways Co., and the municipalities, supplemented by a grant from the Dominion grade separation fund.

Coteau to Ottawa.—We are officially advised that the relaying of the line between Coteau and Ottawa, 70 miles, with 80 lb. steel, will be started as soon as the frost is out of the ground.

Yards at Stoney Creek, Hamilton.—We are officially advised in reference to reports that large yards are to be located at Stoney Creek, near Hamilton, Ont., that no such plan has been decided on.

Brantford Improvements.—In connection with the projected early start on building the Holmedale extension, plans have been prepared for the erection of a new bridge across the Grand River. The present bridge, which has three spans of 100 ft. each, will be replaced by two truss spans of 114 ft. 10 in. each, and two girders 68½ ft. each, on concrete piers and abutments. The route map for the extension shows that it will be 5.68 miles long. The estimated quantities are 85,000 cubic yards of excavation, and 245,000 cubic yards of banks. The maximum gradient will be 1.25%. Construction work is to be started at once, and, according to the agreement with the city council, the line is to be completed by Oct., 1913.

Spur Line at London, Ont.—It is reported that a spur will be built at London to connect the G.T.R. with the London and Port Stanley Ry. now operated by the Pere Marquette Rd. (April, pg. 183.)

The Canadian Collieries (Dunsmuir), Ltd is reported to have arranged to spend $2,000,000 on betterments during this year. The work to be done includes the building of an extension of the railway to no. 8 mine in the Cumberland district, 6.5 miles. The contract for this line, press reports state, has been let to C. Hoard, Victoria, B.C.

The first divisional point, just east of Calgary, Alta., on the Canadian Northern Ry. branch from Saskatoon to Calgary, has been named Hanna, in honor of D. B. Hanna, the company's Third Vice President.

W. J. Camp, Assistant Manager, C. P. R. Telegraphs, while at a recent meeting of the eastern and western divisions of the Association of Railway Telegraph Superintendents, at Chicago, Ill., denied that the C.P.R. had abandoned the use of telephones for train dispatching, as reported in some newspapers. The ground for the reports was fully explained in our Jan. issue.

Electric Railway Department

Toronto's City Engineer on the Use of T and Girder Rails.

C. H. Rust, M. Can. Soc. C.E., City Engineer of Toronto, presented the following report to the city works committee recently, which is of great interest to street railway engineers and construction and maintenance officials:—

In reply to a communication from your committee, forwarding a notice of motion from council regarding the use of T rails as follows: "That the laying of T rails on the streets for street railway purposes be not permitted under any circumstances in the future, and that this council place on record its approval of the grooved rail for the aforesaid purpose," I beg to report as follows:—

Under either the name T or girder (grooved) rail are grouped the various types of rail being manufactured for street railway purposes. Figs. 1 and 2 show the type of T and girder rail which is in most general use today. About 19 miles of this T rail construction has been used in Toronto streets up to the present.

Before a decision can be made as to which is the most suitable rail to instal, consideration should be given as to which is better adapted to meet the requirements: 1. From a railway operating and maintenance standpoint; 2. From a street pavement standpoint; 3. From the standpoint of public convenience.

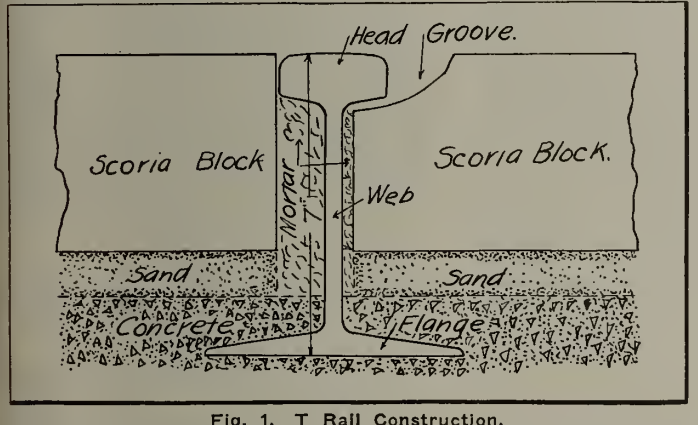


Fig. 1. T Rail Construction.

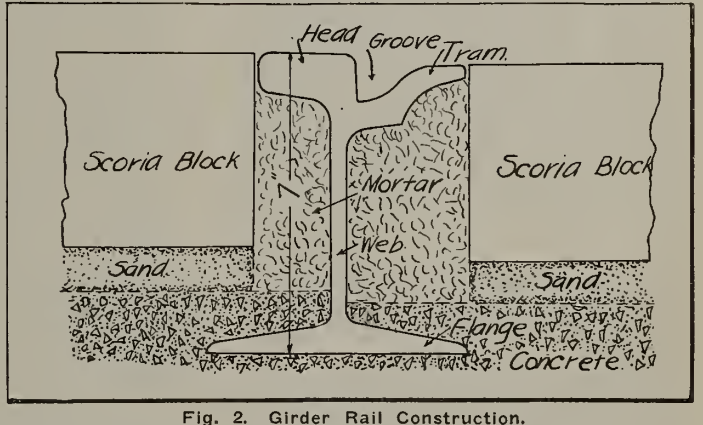


Fig. 2. Girder Rail Construction.

1. From that of the Railway Operating and maintenance standpoint.—The most suitable rail from a railway operating and maintenance standpoint is that which produces the smallest operating and maintenance charge; i.e., which permits of the operating of the rolling stock with a minimum of power and necessitating the smallest possible expense for track and rolling stock maintenance. In the winter, especially in the outlying districts, the ice and snow has a tendency to collect in the groove, rendering it more difficult to maintain a proper service with a grooved girder rail than with a T rail.

1st. Because the head of the T rail is centred directly over the web, the wheel loads produce no overturning effect, and hence has no tendency to spread the gauge; while in the case of the girder rail, every car that passes over it produces an outward thrust because of the fact that the head of the girder rail is not centred directly over the web. The gauge, therefore, has a tendency to spread.

2nd. Heavy vehicles in travelling on the track allowance of girder rail construction cut into the groove of the rail, and also have a tendency to loosen up the gauge. When once this occurs, the trucks of the cars commence to bang, first against one rail and then against the other. This not only aggravates the spread of the gauge, but produces undue wear and tear on both the rail and rolling stock, hence decreasing their useful life and correspondingly increasing the maintenance bill. The friction between the rail and the wheel flanges is also increased because of this swaying motion of the car trucks, and more power is required to maintain the car service. In several instances in this and other cities, the tram of the girder rail has been broken from the rail proper, and the Toronto Ry. Co. is constantly meeting claims for damages for automobile tires cut, torn rubbers, etc., caused by these broken or partly severed trams of rail sticking up above the pavement.

As an illustration of how the gauge of girder rail can be spread by team traffic, the Toronto Ry. Co. laid a 73-lb. girder rail section on York St. in 1893, and for about five years only an occasional car was run between King and Queen Sts. on the northbound track. At the end of that time complaints from the conductors as to the condition of the track led the company to test the gauge, which was found to have spread over an inch, while the gauge of the southbound track, on which the street car traffic had been frequent and hence the team traffic but slight, had remained tight. To tighten and adjust the gauge of street railway track is an expensive operation, as it means tearing up all the pavement between the rails over the section to be repaired.

At present the city is not concerned with this railway operating and maintenance feature, but it soon will be, that is if it is decided to operate and maintain the civic car lines, or if, as has been suggested, it is decided to take over the Toronto Ry.

2. From a Street Pavement Standpoint.—The street railway track allowance throughout the city, with a few very small exceptions, is paved, and girder rail being harder to maintain than T rail, it is more often necessary to tear up the paving, which it is well nigh impossible to replace as evenly as before.

Furthermore, when once the tram side of girder rail has begun to wear, or has been bent out of position, it is impossible to keep the paving blocks alongside it in good condition, because of the severe bumps to which they are subjected by loaded vehicles.

3. From the Standpoint of Public Convenience.—Girder rail owes its popularity from a public standpoint, to the fact that the groove of this rail, which was intended primarily to act as a protection to the flanges of the car wheels, has long served as a convenient and smooth-going highway for vehicular traffic. However, a scoria block is now being made, so patterned as to form, when in place, the groove alongside the gauge side of the T rail, as shown in fig. 1. This block is in service on Wilton Av. and allows of as smooth a riding for vehicles as the ordinary brick pavement.

Unfortunately, while this arrangement meets the requirements for wide tired vehicles, the sharp corners between the gauge side of the head of the T rail and the groove of the scoria block once in a while catch the rubber tire of a light vehicle and force it from the wheel rim.

The swaying of street cars increases in proportion as the gauge of the track increases, and in a street car which is swaying from side to side to any extent, the discomfort to the passengers is considerable, especially so if the cars be crowded, as they are during the rush hours.

Another fact that must not be lost sight of is that the street railway tracks are laid not for the carriage of vehicular traffic, but for the convenience of such of the public as may wish to ride on the street cars that run upon them.

It would help considerably in that now vital problem of rapid transportation if the use of the tracks for vehicular purposes were discouraged.

Under the agreement between the Toronto Ry. Co. and the city, the type of rail to be used has to be approved of by the City Engineer, and I certainly would not recommend the total abolition of the T rail. Each case should be considered on its merits. I am of the opinion that in the congested parts of the city the grooved girder type of rail is the most suitable, but in the outlying districts, where the track allowance is not used so much by the travelling public, and where, during the winter, there is a tendency for snow and ice to gather in the grooved rail, the T rail is the more suitable.

[Notwithstanding the City Engineer's very full and convincing arguments, as given in the above report, the works committee of the city council, none of the members of which are practical men, or have any knowledge of the subject, decided that no more T rail be permitted, except on private right of way. —Editor.]

H. Knight, heretofore cashier, Quebec Ry., Light, Heat and Power Co., has been appointed manager of the company's Kent House at Montmorency Falls.

British Columbia Electric Ry's. Construction Work.

The construction programme so far as the B.C.E.R. Co.'s power and lighting plant is concerned will necessitate expenditures estimated at nearly $3,000,000. The expenditure for railway work had not been announced to Apr. 15. It is not expected, however, that it will include much new work, owing to the fact that the question of the company's franchises in Vancouver and vicinity are being considered, and negotiations are in progress with respect to them. Certain work of doubling lines and extensions previously ordered will be completed.

The Minister of Railways for British Columbia has approved plan showing the general location of a proposed line from Highland Park to Twelfth St., New Westminster; and for a highway crossing over the Yale Road in district lot 2, group 2, New Westminster district. The New Westminster city council has approved of plans for the bridge over the Brunette River, on the extension to Fraser Mills.

Considerable progress is reported to have been made on the new car terminals on the Kitsilano Indian reserve, Vancouver.

The Vancouver, Fraser Valley and Southern Ry., a subsidiary of the B.C.E. Ry., has been authorized by the Dominion Parliament to enter into agreements with the B.C.E. Ry. and the Vancouver Power Co., and has been given an extension of time within which to build lines from New Westminster to the International boundary near Douglas; from the New Westminster bridge to Chilliwack, and westerly from the Fraser River to Ladner's Landing. It is proposed to have surveys made for the line to Ladner's Landing made at once.

The company is building a railway from Port Moody to Lake Coquitlam, about six miles. The company is building a big dam on the lake, and construction material will be taken in over the line, and logs from the lake will be hauled out. Steam will be used as the motive power.

The Minister of Railways for British Columbia has approved plans showing the general location of the line under construction from Victoria to Deep Cove, and the branch from mileage 20 to Union Bay, Vancouver Island. (April, pg. 196.)

The programme also includes the increasing of the North Arm hydro electric plant by the addition of three 14,000 h.p. units at a cost of $1,000,000, the addition of a 5,000 k.w. turbo generator at the Vancouver steam auxiliary plant at a cost of $250,000, the doubling of the capacity of the substations at Vancouver, Lulu Island, Point Grey, New Westminster and Burnaby and general light and power extension works.

Operations are steadily progressing on the preliminary work for the additional installation at the North Arm hydro electric plant, 900 men being now engaged on the new dam at the outlet of Lake Coquitlam. This number will be raised to 1,300 as the outdoor working season opens. At Lake Buntzen about 400 ft. has been driven on the 2,250 ft. tunnel which will convey the water from the dam to the generating station. This work is being rushed, operations being carried on through two shafts, 75 ft. deep. About 40,000 cubic yards of granite have been cleared away on the site for the new station. At Lake Coquitlam about 50,000 cubic yards have been placed in the toe wall of the large dam and the work of cementing the tunnel 28 x 18 ft., which will divert the river, is in progress. Extensive clearing operations and installation of special equipment for the New Westminster water supply are also being carried on.

Plans have been prepared for a new substation on Earl's Road, South Vancouver, for the regulation of the light and power service in that district as well as on the Westminster interurban line, along which the station is located. The building will be 70 x 86 ft., one story, with an additional half story at one end for transformer gallery, the type of construction being reinforced concrete. The electrical equipment will consist of two 1,000 k.w. motor generator sets, two banks of transformers of 3,000 k.w. each for light and power service, eight arc regulators with a total capacity for 800 lamps and a switching station for a 10,000 volt feeder switch. The total investment at the point will be $125,000.

Fake Accident Cases in Toronto.

In the county court at Toronto, A. Burnett recently claimed $500 damages against the Toronto Ry. Co. for injuries alleged to have been sustained through his being jolted from a car in boarding it, on Oct. 12, 1911. The plaintiff not being in court when the case was called, the medical evidence was taken, when Dr. A. H. Garratt detailed conversations between himself and the plaintiff, covering the description of the alleged injuries by the plaintiff, the medical treatment administered, and an opinion as to the period during which partial disability would continue.

The plaintiff, on being called, stated that he had not been injured in any accident, but was a detective engaged by the Toronto Ry. Co. in an effort to stop the launching of fake, or trivial, claims for damages. His visit to Dr. Garratt was at the request of an official of the company, and during the time he was visited by the doctor he was able to be out, and was only at home when the doctor was expected. He had been examined by two doctors engaged by the company, after he had been to Dr. Garratt, and both of them knew him to be in good health and without mark.

J. W. Curry, K.C., then stated that he had been specially retained to act for the Toronto Ry. Co., which had felt obliged to take the action decided upon in this case to protect its interests. It had come to the notice of J. H. Forrest, Claims Agent, that damage actions were being brought against the company on evidence not supported by facts, and it was necessary to take the steps disclosed on account of the frequent unreliability of medical evidence.

A second case brought by W. E. Smalling, on similar lines, was also called, and after hearing the evidence as quoted above, both cases were dismissed.

As an outcome of the foregoing cases, R. J. Fleming, General Manager; J. H. Forrest, Claims Agent, Toronto Ry.; J. W. Curry, K.C., A. Burnett and W. E. Smalling were indicted before the grand jury of the general sessions at Toronto, Apr. 11, and true bills returned, charging them in five separate counts, with having conspired to commit the crime of fabricating evidence with intent to mislead a court of justice, of wilfully attempting to obstruct, pervert or defeat the court of justice, and by maliciously, fraudulently and vexatiously procuring the suits above mentioned, for damages for pretended injuries suffered by plaintiffs, when the suits were, as they well knew, feigned and fictitious actions, to bring into contempt and reproach, the courts of justice, one of the judges and the administration of justice, and against the peace of the King, his crown and dignity.

The matter is being discussed from all points by those concerned, and it is stated that the discipline committee of the Ontario Law Association is considering the question of taking action as regards the counsel engaged in the cases, while the attention of the Medical Council has also been directed to it, and to the position of the medical men engaged in damage cases generally.

Whatever the ultimate outcome of these cases may be, they will doubtless serve as a warning to medical men, to the scrupulous ones to be extremely particular in thoroughly satisfying themselves as to reported injuries before giving evidence, and to the unscrupulous ones that they are running a great risk in assisting fake accident operators.

Park Attractions and Special Days.

By C. B. King, Manager, London, Ont., Street Ry.

We are somewhat limited in the way of park activities, as we operate a purely city system and have no park except the city waterworks park of some 700 acres, situated on the Thames river four miles below the city. Being a city park, the installation of park attractions is practically prohibited, so that about the only attractions there are picnic parties from the smallest up to the annual school picnic when there will be from 8,000 to 10,000 people on the grounds. This picnicing at the city park is encouraged by us when it seems favorable to do so by bonuses of some 5 to 10%.

Our principal holidays are Victoria Day, Dominion Day, Municipal Day, the first Monday in August, and Labor Day, the first Monday in September. The attractions and the traffic on these days, of course, depend almost entirely upon the weather. We endeavor to get large societies to hold their annual picnics on other days than these public holidays when general traffic is large enough anyway if the weather is good. By having the large picnics on an off day it is more correctly extra business.

The one regular attraction at the park is a summer theatre which is operated by a stock company for 12 weeks during the season. We have found stock companies playing a good repertoire are very much more attractive than vaudeville. They change the programme twice a week and draw an average of 500 or 600 people an evening. The admissions to the theatre range from 5 to 25c and pay something more than the cost of the attractions.

Hours of Labor for Ontario Electric Railway Employes.

The Ontario Legislature has passed the following act:—

1. The Ontario Railway and Municipal Board Act amended by inserting the following as section 58a:—

58a (1).—The board may regulate the hours during which conductors and motormen employes of a street railway company may be required or permitted to work, but in no case shall an employe be permitted to work more than six days in a week or 10 hours per day, and whenever practicable and reasonable, such 10 hours work shall be performed within twelve consecutive hours.

(2) The power conferred by subsec. 1 may be exercised notwithstanding the provisions of any agreement between a municipal corporation and a railway company as to hours of labor.

(3) Every company which, and every director, superintendent, manager or officer of a company who contravenes the provisions of any order of the board made under the authority of subsec. 1, or contravenes any of the provisions of this act, shall for each contravention incur a penalty of not less than $100 and not more than $250, recoverable under the Ontario Summary Convictions Act.

B. J. Arnold, of Chicago, Ill., has been engaged by the Montreal and Southern Counties Ry. as consulting electrical engineer, in connection with its projected extensions.

Electrification of the C.P.R. Rossland Subdivision

There have been persistent rumors during the last three or four years that the C.P.R. intended to electrify the mountainous portions of the British Columbia Division. Nothing definite has been done in the matter until quite recently, but now the electrification of the Rossland subdivision is to be pushed forward at an early date to determine the applicability of such a course under the heavy conditions to be encountered. The underlying purpose of this installation is to determine what electrification will do for main line operation.

The section to be electrified runs from Rossland to Castlegar Jct., the junction with the Boundary subdivision. From Smelter Jct. to the end of the section at Rossland, 10.6 miles, is one long continuous grade. The length of the Rossland subdivision is 29.3 miles, which with sidings and yard track mounts up to a total trackage of 43 miles, all laid with 80 lb. rails. From Castlegar Jct. to Smelter Jct., 18.7 miles, there is a ruling gradient of 2.2% except for a short distance at China Creek hill, where it is 4%. From Smelter Jct. to Rossland is the heavy portion of the line, with a 4.8% ruling gradient averaging 4% over the section, and a maximum curvature of 20°. One mine switch on this line has a 26° curvature. All grades and curves are compensated.

There is a fairly heavy tonnage to be handled over both portions of the line. The average daily tonnage from Castlegar Jct. to Smelter Jct. (the junction point for Trail, two miles distant on a branch) is 2,489 tons, of which 2,349 are freight. In the opposite direction the figures are 1,039 tons, of which 899 are freight. From Rossland to Smelter Jct. there are 2,110 tons, of which 1,970 are freight; and in the opposite direction 1910 tons, 1,770 tons being freight. This traffic is now being handled by five locomotives; two of 115% capacity or 23,000 lbs. tractive power, two of 180% or 36,000 lbs., and one of 120% or 24,000 lbs.

The motive power installation will consist of four 70 to 80 ton electric locomotives, power being obtained from the West Kootenay Power and Light Co. at probably 60,000 volts. This will be utilized through motor generator sets in a substation located either at Trail or Smelter Jct.

Two companies are tendering on the work, the Canadian Westinghouse Co., represented by D. L. Keiser, is advocating a.c. 6,600 volts, while the Canadian General Electric Co., represented by H. D. Byane, special agent, is advocating 2,400 volts d.c.

The matter is being considered by the C.P.R. management and a decision will probably be given at an early date.

Electric Trunk Railway Operation is actively being planned for in many of the German states. Prussia, Bavaria and Baden have led in this planning, and Saxony is about to consider the subject. The Bavarian and Baden state railways, it is stated, have adopted as standard the single-phase system, with 15,000 volts trolley-line potential and 16⅔ cycles frequency. This is the same standard as adopted for the Prussian development.

Night Cars in Winnipeg.—The Winnipeg Electric Ry., under its contract with the city, was required to operate cars from midnight until 6 a.m. after the city's population reached 100,000, and to charge double the day rate of fare. The company has arranged with the city council to operate cars until 2 a.m. at the day fare, in lieu of an all night service.

The Future of the London Street Railway.

A street railway expert from New York City is working in London, Ont., on behalf of the city utilities committee, preparing figures as to the cost of purchasing the local system. His coming was not announced, but it is known that the object of securing his report is to try and prove that the price asked for the stock, viz., $150—is excessive. The city authorities claim that $125 is about the value of the shares. The action of the council in adopting the report of the committee as to track extension and general improvements is also significant. Friends of the company assert that the city is demanding its pound of flesh in order to influence the possible sale of the system. Under the charter granted to the company the entire system must be kept up to the standard of the lines operated in Cleveland, Ohio, and this is to be adhered to strictly. As a result air brakes must be installed on all cars, and many thousands of dollars worth of new equipment provided. Track extensions due to London on a population basis are to be laid in the north end, with a crossing over the C.P.R. at Adelaide street.

Establishment of Manitoba Public Utility Commission.

The Manitoba Legislature, at its recent session, passed an act providing for the establishment of a Public Utility Commission, and prescribing its powers and duties. The words "public utility" are defined to mean every corporation other than a municipal corporation (except where such municipal corporation voluntarily comes under the act in the manner provided) engaged in carrying on a telegraph or telephone business, the conveyance of travellers or goods over a railway, street railway or tramway, companies for the supply of water, gas heat, light or power, the Government telephones and the Government elevators, and covers all companies now existing, or which may hereafter be incorporated. The commission is to consist of one member to be called the Public Utility Commissioner, who shall constitute a court of record. The Commissioner shall devote the whole of his time to his duties, and shall hold office during good behavior. A secretary is to be appointed, and such experts as may be necessary shall be appointed upon the recommendation of the Commissioner. The Commissioner will sit where the Government shall fix his permanent office, but sittings may be held in other parts of the province. The remuneration of the Commissioner, Secretary and experts is to be fixed by the Government. The Public Utility Commissioner is to have jurisdiction in all matters given to the Railway Commissioner, the powers of that officer being vested in the Public Utility Commissioner; in all questions relating to the transportation of goods or passengers on lines of any tramway, street railway or steam railway under the jurisdiction of the province; in the matter of reducing tolls where found upon complaint to be unreasonable; to fix terms and conditions for the entering of any public utility in any municipality; to settle differences between companies and municipalities as to the placing of poles, stringing wires, etc., across, along, or under public streets; and power to order extensions of public utilities where necessary. Power is also given to investigate complaints, to value the property of public utilities, to fix rates, to require the filing of tariffs, to make regulations, to maintain necessary conveniences for the transaction of business. The act also contains provisions relating to the conduct of public utilities which the Commissioner has power to enforce; sections governing the procedure of the Commissioner's court, the costs of the same. The decision of the Commissioner as to questions of fact or law is to be binding, and is not to be bound by the findings of any other court as to questions of fact or law. An appeal may be made to the Court of Appeal upon questions involving the jurisdiction of the Commission, with the permission of a judge of the Court of Appeal, to be applied for within 15 days after the decision questioned. In addition to any penalties imposed by the Commissioner, the offender may be proceeded against summarily before a police magistrate, and a fine of not less than $50, nor more than $100 and costs may be inflicted, with the alternative of imprisonment for not exceeding six months. All acts and parts of acts inconsistent with the present act are repealed. The act came into force, April 8.

T. D. Cumberland, county court judge at Brandon, has been appointed Commissioner.

Traffic Regulation in Hamilton.

When the new traffic bylaw comes into effect on May 1, the Hamilton, Ont., St. Ry. will inaugurate a few changes that will work for the benefit of the system The bylaw calls for the direction of the cars at the corner of King and James streets and James and Barton streets by a policeman instead of an inspector, as is the case at present. Under the present system of running things the inspector holds all cars for connections at the points mentioned above. In so doing many of the cars lose on their schedule, possibly a minute or two minutes, depending largely on the crowds. Thus it is often noticed that one car will be seen going down King street, for instance, loaded, while another car following at a close interval is practically empty. This is the situation the street railway officials wish to overcome. The plan, it is thought, will be to do away with all connection, and thus keep the cars more closely to their schedule, and at the same time improve the service to a greater extent.

Interchange of Traffic Between Ontario Electric Railways.

On April 15 the Ontario Court of Appeal set aside the Ontario Railway and Municipal Board's order providing for an interchange of traffic between the city's municipal electric railway and the Toronto Ry. This, however, will not have any practical effect, as the Ontario Legislature at its recent session passed The Ontario Railway Amendment Act as follows:—

"Board" shall mean The Ontario Railway and Municipal Board.

"Corporation" and "corporations" shall include a municipal corporation.

Where two or more electric street railway systems owned or operated by different corporations lie contiguous to one another, it shall be the duty of each corporation to afford to the other or others all reasonable facilities for the interchange of traffic and running rights over its lines.

If the corporations are unable to agree as to the nature or extent of the facilities and running rights to be afforded to one another or as to the terms and conditions upon which they shall be exercised, the matter shall be determined by the Board, and it shall be the duty of each corporation to conform with and obey any order of the Board made in the premises.

The Board shall have jurisdiction and authority to require each of the corporations to give to the other such reasonable facilities for the interchange of traffic and running rights over its system or any

part of it as the Board shall deem to be in the public interest and on such terms and conditions as the Board may deem just.

The Board may from time to time vary the terms of any order made under either of the next preceding sections, as it may deem just.

The powers conferred on the Board may be exercised in respect of an electric street railway system which a corporation has authority to construct, the location and plans of which have been approved by the Board, notwithstanding that no part or that part only of the system has been constructed, and such powers may also be exercised notwithstanding that a corporation has the exclusive right to build and operate surface railways within the municipality or any part of it.

This act shall not come into force until a day to be named by the Lieutenant-Governor by proclamation.

Toronto Railway Single Truck Cars.

About 50 single truck cars have just been turned out of the Toronto Railway Co.'s shops for use on its own lines in the city. In general design they closely resemble the large double truck cars which have been turned out from time to time from the company's shops. The side sills are reinforced with steel side plates, as in the larger cars, and both ends have enclosed vestibules much larger than the platforms of the older type of single truck cars built some few years ago. In conformance with the railway company's standard practice, the cars are semi-convertible for use in summer traffic. The trucks are new in the company's practice, the design resembling the frame and spring rigging of a locomotive, this construction being calculated to minimize the swaying motion incidental to single truck cars. Among the new features of construction embodied in these new cars may be mentioned the front door arrangement. It is a swing door operated by the motorman by a handle conveniently located near the controller. The door is glazed in the lower panels in order that the motorman may observe the movements of the alighting passengers.

Electric Railway Finance, Meetings, Etc.

British Columbia Electric Ry.—Gross earnings for Feb., $473,036; operating expenses, $290,661; net operating earnings, $182,375; renewal funds, $37,935; net earnings, $144,440; approximate income from investments, $25,000; net income, $169,440, against $348,332 gross earnings; $212,239 operating expenses; $136,093 net operating earnings; $29,770 renewal funds; $106,323 net earnings; $20,000 approximate income from investments; $126,323 net income for Feb., 1911. Aggregate gross earnings for eight months ended Feb. 29, $3,791,677; net earnings, $1,339,531, against $2,708,734 aggregate gross earnings; $1,096,775 net earnings for same period 1910-11.

Calgary Municipal Ry.—Passenger earnings for March, $39,436.20; miscellaneous earnings, $615.10; total earnings, $40,051.30; operating expenses, $24,-525.71; net operating earnings, $15,-525.59; contingent account, and interest and sinking fund, $7,271.89; net profit, $8,259.70, against $22,493.10 passenger earnings; $323.15 miscellaneous earnings; $22,816.25 total earnings; $11,-639.53 operating expenses; $3,856.69 contingent account, interest and sinking fund; $7,320.03 net profit, for March, 1911. Revenue per car mile, 28.828c.; expenses per car mile, 17.041c.; gross surplus per car mile, 10.787c.; cost of power per car mile, 4.135c.; proportion of expenses to revenue, 61.2%.

Calgary Municipal Ry.—The annual statement issued by the Calgary, Alta., city council for the year 1911 shows that the electric railway is carried as an asset of $1,416,120.

Cape Breton Electric Co.—Gross earnings for Feb., $23,693.29; expenses and taxes, $15,356.19; net earnings, $8,337.10; interest charges, $4,495.83; balance, $3,841.27; sinking and improvement fund, $1,140; net balance, $2,701.27, against $22,082.92 gross earnings; $14,-212.88, expenses and taxes; $7,870.04 net earnings; $4,512.50, interest charges; $3,357.54, balance; $1.141.66, net balance for Feb., 1911.

London St. Ry.—Gross earnings for March, $23,540.98; expenses, $16,912.69; net earnings, $6,528.29; deductions, $2,-450. net income, $4,178.29, against $21,-175.20 gross earnings; $15,370.73, ex-441.75, deductions; $3,362.72 net income, for March, 1911. Aggregate gross earnings for three months ended March 31, $68,785.78; expenses, $48,265.01; net earnings, $20,520.77; deductions, $7,-176; net income, $13,344.77, against $61,080.86 aggregate gross earnings; $45,065.94, expenses; $16,041.92 net earnings. $7,000.05, deductions; $8,-925.80, net income for same period, 1911.

Montreal St. Ry.—Passenger earnings for March, $422,619.90; miscellaneous earnings, $5,043.82; total earnings, $427,663.72; operating expenses, $270.-968.86; net earnings, $156,695.86· city percentage of earnings, $34,037.12; interest on bonds and loans, $15,822.10; rent leased lines, $661.37; taxes, $5,000; total charges, $55,520.59; surplus, $101.-175.27; expenses per cent. of earnings, 63.36, against $368,079.75 passenger earnings. $3,912.68, miscellaneous earnings; $371,992.43, total earnings; $234,-484.22, operating expenses; $137,508.21, net earnings; $25,616.79, city percentage of earnings; $15,498.86, interest on bonds and loans; $607.10, rent leased lines; $4,700, taxes; $46,422.75, total charges; $91,085.46, surplus; 63.03, expenses per cent. of earnings, for March, 1911. Aggregate total earnings for six months ended March 31, $2,533,428.96; operating expenses, $1,569,567.30; net earnings, $963,861.66; total charges, $261,301.78; surplus, $702,559.88. expenses per cent. of earnings, 61.91, against $2,202,914.82, aggregate total earnings; $1,370,472.62, operating expenses; $832,442.25, net earnings; $229,-205.39, total charges; $603,236.86, surplus; 62.21, expenses per cent. of earnings for same period, 1910-11.

Montreal Tramways and Power Co.—The sale of $5,000,000 6% collateral gold notes to the National City Bank and Potter, Choate and Prentyo, of New York, was confirmed Apr. 9. They are dated Apr. 1, and mature on Apr. 1, 1915. They were placed on the market, Apr. 11, at about par, with interest; and the issue was considerably over subscribed. The amount realized will be used for the retirement of all the floating indebtedness of the company, and no further financing is contemplated during the life of the notes.

Montreal Tramways Co.—President E. A. Robert is quoted as stating, April 9, that negotiations for the financing of the company's complete programme were proceeding satisfactorily, and he hoped before long to be able to announce that the money necessary was in hand. The additional funds are required for improvements to existing lines and for the building of extensions.

Quebec Ry., Light, Heat and Power Co.—The directors decided, Mar. 29, not to pay any dividend for the present, but to utilize the surplus earnings for the improvement of the lines.

Toronto Ry.—Gross earnings for Feb., $640,264; operating expenses, $320,407; net earnings, $319,838, against $556,056 gross earnings; $274,198 operating expenses; $281,858 net earnings for Feb., 1911. Aggregate gross earnings for two months ended Feb. 29, $1,296,355; net earnings, $649,276, against $1,146,474 aggregate gross earnings; $579,126 net earnings for same period 1911. The figures quoted cover the carnings, etc., of the Toronto Ry., Toronto and York Radial Ry., and the allied companies.

Winnipeg Electric Ry.—Gross earnings for Feb., $299,246; operating expenses, $164,942. net earnings, $134,304, against $309,500 gross earnings; $162,-074 operating expenses; $147,426 net earnings, for Feb., 1911. Aggregate gross earnings for two months ended Feb. 29, $618,680; net earnings, $278,-325, against $655,645 aggregate gross earnings; $305,221 net earnings for same period 1911.

Nelson Street Railway Co., Ltd.

This line, which commenced operation Nov. 9, 1910, ran for 21 days, when an accident caused by running over the belt line extension before the track was properly in shape, together with a serious breakdown in the city's power plant, kept the systems shut down until June 21, 1911, since which time the line has been run steadily. The operating account to Feb. 29, 1912, is as follows:—

Receipts		$10,253.38
Operating expense		9.037.35
Operating profit		$ 1,216.03
Personal injury	$ 750.00	
Repairing wrecked car	1.345.56	2,095.56
Net loss		$879.53

No allowance has been made for meeting fund requirements at the rate of $800 a year for two years, under the debenture deed, nor of depreciation for the same period.

The authorized capital is $50,000; subscribed, $34,639; paid up, $30,309.69; outstanding calls, $4,329.31. The assets are stated as $71,245.04, and the liabilities as $42,937.04.

We are advised that no extensions of the system are contemplated at present.

Electric Railway Notes.

The British Columbia Electric Ry. is having a number of its interurban cars re-modelled.

L. G. Robinson, of the British Columbia Electric Ry. engineering department, has resigned to enter private business.

R. Knight, Superintendent, Edmonton Radial Ry., sent his resignation to the Edmonton, Alta., city council, April 12.

The British Columbia Electric Ry. has received the last of the 25 city cars which it ordered from the J. G. Brill Co. in Dec., 1911.

The Montreal Tramways Co. has received one steel underframe pay-as-you-enter car, from the Canadian Car and Foundry Co., Montreal.

The St. John Ry., St. John, N.B., has ordered six 21 ft. semi-convertible, pay-as-you-enter cars, 32 ft. long over all, from the Ottawa Car Co.

The New Brunswick Public Utilities Commission sat in Moncton, Mar. 28, to settle the Moncton Tramways, Electricity and Gas Co.'s schedule of rates.

The Grand Valley Ry. began re-operating its cars between Brantford and Galt, Ont., Mar. 26, the line having been blocked with snow since early in the winter.

The Toronto city council, April 1, declined to authorize the engagement of Ford, Bacon and Davis, New York, to make a report on the street railway traffic problem in the city.

E. P. Newhall, formerly Western Superintendent, Pacific Express Co., has been appointed in charge of the freight

and passenger departments of the Alberta Interurban Ry., now being organized.

During Feb., only one fatal accident to an employe, connected with the operation of electric railways in Canada, was reported, and four non-fatal accidents. The fatality was due to a rear end collision.

E. L. Milliken, heretofore Superintendent of Lighting, Cape Breton Electric Co., Sydney, N.S., has been appointed Manager, vice H. C. Foss, appointed General Superintendent, Savannah Electric Co., Savannah, Ga.

The Calgary Municipal Ry. has received six 33½ ft. car bodies, 46½ ft. long over all, semi-convertible, pay-as-you-enter type, mounted on 27-G-1 trucks, equipped with Westinghouse 101-B-2 motors, from the Ottawa Car Co.

It was reported during April, that owing to some dispute arising between the Levis County Ry. and the city of Levis, Que., in relation to the company not rebuilding the elevator which connected the upper and lower levels of the city, and which was destroyed by fire last year, that the company would suspend its city car service on May 1. We are officially advised that there is no truth in the report.

H. C. Foss, General Manager, Cape Breton Electric Co., which operates the street railway service in Sydney, the Sydney and Glace Bay Electric Ry., and the ferry service between Sydney and North Sydney, N.S., has been appointed General Superintendent Savannah Electric Co., Savannah, Ga. Both these companies are under the Stone and Webster Corporation's management.

C. W. Moodie, who recently issued a writ against the directors of the Dominion Power and Transmission Co., Hamilton, Ont., for breach of trust, issued a second writ, Apr. 1, for $2,595.55, alleged to be due on preferred stock he holds. It is stated that on the formation of the present company he declined to exchange his then existing stock, which was bearing interest at 5%, for new stock, with interest at 6%, since raised to 7%, and that his claim is for the difference between the interest on the old and present stocks.

The Dominion Power and Transmission Co. has ordered, from the Preston Car and Coach Co., Preston, Ont., 24 cars, for its electric railway services. The number mentioned is being divided between single and double truck cars, but in what proportion has not, at the time of writing, been decided. The double truck cars, will be 30 ft. over bodies, 43 ft. over all, 4½ ft. wheel base, with 33 in. wheels, with 27-G-1 trucks, and the single truck cars, will be 21 ft. over bodies, 33 ft. long over all, 8 ft. wheel base with 33 in. wheels.

The British Columbia Electric Railway Co. has ordered 24 interurban cars from the St. Louis Car Co., the additional rolling stock, with electrical equipment, representing an outlay of $250,000. Twenty-two of the cars are intended for passenger service. They will be 50 ft. long, providing seating accommodation for 64 persons, 44 in the main section and 20 in the smoking compartment. They will be of ironclad construction, solid steel riveted plates forming a band around the entire body of the car. The roof will be of the arch type and slat seats will be used for sanitary reasons. The air brake equipment and interior finish and fittings will be in accordance with the latest improvements. The electrical equipment will consist of four 75 h.p. motors. The two baggage cars will be 55 ft. long and similar in construction to the cars now used for the purpose on the company's Fraser Valley branch.

Electric Railway Projects, Construction, Betterments, Etc.

Alberta Interurban Ry.—We are officially advised that rapid progress is being made with location surveys for the first line proposed to be built. Location plans for the first 25 miles out of Calgary, Alta., have been prepared, and application is being made to the Minister of Railways at Ottawa for their approval. The survey work is in charge of K. J. C. Zinck, formerly Assistant Engineer, G.T. Pacific Ry., Winnipeg; H. G. Dimsdale as assistant. A meeting for the formal organization of the company and the authorization of construction was held at Calgary, Apr. 16. (Apr., pg. 196.)

Brandon Electric Ry.—The Manitoba Legislature has amended the company's act of incorporation in various particulars, notably as to the method of organization, power to make regulations for the operation of traffic, and power to make agreements with or to amalgamate with other companies.

A proposition for the incorporation of a company to build an electric railway in Brandon, under the title of the Wheat City Electric Ry., was not proceeded with.

The city council passed a resolution, Apr. 10, approving the agreement with J. D. McGregor, as amended at meetings of the council held Apr. 9 and 10, for a franchise for an electric railway in the city. It was ordered that a bylaw be prepared embodying the provisions of the agreement for submission to the ratepayers upon the earliest possible date. The agreement gives Mr. McGregor an exclusive franchise in the city for 30 years. The bylaw will be voted by the ratepayers May 13.

Mr. McGregor intimated that he expected to be able to acquire the Brandon Electric Light Co.'s plant and franchises for operation in connection with the railway, and he also expected that his company would build radial railways in several directions from the city. (Mar., pg. 147.)

Burrard, New Westminster and Boundary Ry. and Navigation Co.—W. McNeill, Assistant General Manager, Western Canada Power Co., was in Victoria, B.C., Apr. 4, negotiating with the Government for the building of the proposed electric railway from Vancouver to Mission, B.C. The estimated cost of the line and the bridge across the Pitt River near Coquitlam is $4,000,000, and the company is asking for Government aid to build the bridge. The Premier is said to have promised favorable consideration to the project.

The Board of Railway Commissioners has approved the location plan for the line from Michen to Port Moody, 40 miles.

The annual meeting of the Western Canada Power Co. was held in Montreal, Apr. 3, C. H. Cahan, President, being in the chair. The company has now contracts for the delivery of 15,000 h.p. from its Stave Falls plant. The present plant can be extended to deliver 25,000 h.p. at very little extra expenditure, and there is sufficient water power to enable the plant to be increased so as to deliver 100,000 h.p. A. R. Doble is Secretary of the company and R. F. Hayward General Manager. (Apr., pg. 196.)

Edmonton Radial Ry.—The Edmonton, Alta., city council has given a contract to the E. Manders Construction Co. for grading and paving street railway allowance on certain streets, at an estimated cost of $30,000. The contractor is to do the excavation, grading, concrete and surface work; the city provides and lays the ties and rails, and the overhead work. It is expected that tenders will be invited at an early date for the construction of additional lines on unpaved streets.

Plans for the proposed new car barns at Edmonton are being prepared by the City Architect. The building will be 310 x 500 ft., with capacity for about 150 cars. The structure will be of brick with stucco trimmings and with tar and gravel roof, and will be 27 ft. high. At one end of the building offices will be arranged. It is proposed at present to build the office section and about 123 ft. frontage of the barn. (Apr., pg. 196.)

Forest Hill Electric Ry.—The Ontario Legislature has refused to incorporate a company with this title. (Apr., pg. 196.)

Galt, Preston and Hespeler St. Ry.—The town of Berlin wants the G.P. and H.S.R. to exercise running rights over the Berlin and Waterloo St. Ry., owned by the town, and to build from Waterloo to Elmira.

Greenwood-Phœnix Tramway Co.—We are advised that the tunnel, which is 9 x 9 ft., had been driven 3,000 ft. under the hill, between Greenwood and Phœnix, B.C., when work was suspended at the end of Dec., 1911. It was not known when we were advised, Apr. 10, when work would be resumed. (Jan., pg. 38.)

Guelph Radial Ry.—An order is reported to have been given to the Algoma Steel Co. for rails for the extension of the line in St. Pauls Ward, Guelph, Ont.

Hamilton, Grimsby and Beamsville Electric Ry.—Press reports state the project to extend the line from Beamsville into St. Catharines have been abandoned, and that surveys are being made for a new line from Hamilton to St. Catharines. The projected route will probably parallel Barton St. to Winona, then along the present tracks to Grimsby, and following a new route from just outside Grimsby to St. Catharines. (Apr., pg. 196.)

Hamilton Street Ry.—The special railway committee reported to the Hamilton city council, Apr. 2, that the company did not intend to make any extensions or to lay any new track this year. (July, 1910, pg. 683.)

Hamilton, Waterloo and Guelph Ry.—The Dominion Parliament has extended the time for the construction of the company's authorized lines of railway, repealing sec. 4, chap. 106, of the statutes of 1908, and enacting a new section fixing the capital stock at $9,000,000.

Press reports state that plans have been prepared for the entrance of the company's lines into Toronto, by means of a tunnel, the construction of which is estimated to cost $7,500,000. Some of those associated with J. Patterson in the promotion of the company stated that the company's engineer was negotiating for the entrance into Toronto, and that the plans included a subway starting from near High Park. (Apr., pg. 196.)

Hull Electric Ry.—Track approaches are being laid to the new car barns at Maniwaki Jct., and a new double switch is being put in at Brewery St. and Aylmer Road, Hull, Que. (Apr., pg. 196.)

International Ry. (British Columbia).—H. T. Thrift, Hazlemere, B.C., is Secretary of the International Ry. and Development Co., which is reported to have under consideration a project to build an electric railway from Ladner, B.C., to Huntingdon, Wash. (Mar., pg. 148.)

Lake Erie and Northern Ry.—The Dominion Parliament has voted a subsidy up to $6,400 a mile, upon the usual terms and conditions for the building of a line from Galt to Port Dover, not exceeding 58 miles, and from Paris to Ayr, 10 miles.

The approved route of the line is west of the G.T.R. out of Port Dover, crossing to the east side, just south of Simcoe, and across the G.T.R.-Wabash line,

and then making straight for Brantford, passing through Bloomsburg, Waterford, Boston, and Mount Pleasant. The terminal station in Brantford will be on the old G.T.R. station site, Colborne St. There will be a maximum gradient on this section of the line of 1%. The route from Brantford to Galt will pass through Paris, Blue Lake and Glenmorris, and the branch to Ayr will start from Paris. On this section the maximum gradient will be 0.5%. The track will be laid with 80 lb. steel, and the overhead wires, carrying 11,000 volts, will be strung on steel bridges instead of poles. Substations will be built at Simcoe and Waterford, the main station being at Brantford. There will be four heavy bridges on the line, one 475 ft. across the Michigan Central Rd., and the Toronto, Hamilton and Buffalo Ry. at Waterford; a 1,200 ft. trestle at Mount Pleasant, and bridges over the Grand River at Brantford and Paris.

The location plans for the line from Port Dover to Brantford have been approved, and the location surveys north of Brantford are reported to be nearly completed. (Mar., pg. 148.)

Lethbridge Municipal Ry.—A start was made on the grading for the municipal electric railway in Lethbridge, Alta., Apr. 8. The work was started with a public ceremony at the corner of Third Ave. and Thirteenth St. South. Superintendent Reid is in charge of construction and expects to have the first section of the line in operation early in Oct. (Feb., pg. 31.)

London and Lake Erie Ry. and Transportation Co.—The Aylmer, Ont., board of trade passed a resolution, Apr. 4, inviting the company to extend its line from St. Thomas to that place. The company's officials in London are quoted as having stated, Apr. 6, that the extension to Aylmer will come some time, but nothing has been done yet in the direction of making surveys. (Dec., 1910., pg.

A conference was held in London, April 17, between the company's officers and a deputation from Aylmer and district relative to a proposal to extend the company's line from St. Thomas to Aylmer. W. K. George and A. B. Wood, Toronto, and T. H. Purdom, K.C., London, represented the directors and arranged to go over the proposed route at an early date, and stated that the company would be ready to undertake the building of the line provided arrangements were made for the right of way, and for the guarantee of a certain percentage of bonds.

Medicine Hat., Alta.—A press dispatch of Apr. 13 says the ratepayers voted against granting an electric railway and power franchise to Montreal, Toronto and New York people.

Montreal and Southern Counties Ry.—The Board of Railway Commissioners has authorized the company to build from the G.T.R. property east of Front St., St. Lambert, Que., to the Central Vermont Ry., crossing Victoria Ave., by an overhead bridge. Work is being progressed with rapidly on the new station building in St. Lambert, which it is expected to have completed by May 31. The extension of the line to the Country Club and La Prairie is expected to be finished early in May.

Application was made to the board of control, Apr. 9, to have the company's proposals for an additional right of way so that its lines may be extended to St. Catherine St., Montreal, be dealt with at once.

B. J. Arnold, of Chicago, has been appointed Consulting Electrical Engineer and is considering a comprehensive scheme for the extension of the company's lines. (Apr., pg. 197.)

Montreal Tramways Co.—The Quebec Legislature has confirmed the amalgamation of the Montreal Street Ry. and its various subsidiary companies, under the title of the M.T. Co., and has amended its charter in various details. It has also confirmed an agreement between the city of Montreal, the M.T. Co., and the Montreal Park and Island Ry. (Apr., pg. 197.)

Mount McKay and Kakabeka Falls Ry.—W. F. Hogarth, President and General Manager, attended a meeting of the Fort William, Ont., city council, Apr. 9, and explained the company's plans for entering the city along Neebing Ave. He said the company had also its plans completed for a line to Port Arthur. (Mar., pg. 148.)

Niagara Falls, Welland and Dunnville Electric Ry.—We are officially advised that the company is negotiating with an English firm with respect to the building of its projected line. No construction has yet been undertaken.

The second paragraph in the item on pg. 197 of our last issue contained the names of the officers of the Niagara Welland and Lake Erie Electric Ry., the officers of the N.F., W. and Dunnville E. Ry. are:—President, F. R. Labor, M.P., Dunnville, Ont.; Vice President, Dr. Boulter, Niagara Falls, Ont.; Secretary, F. Misener, Marshville, Ont.; Treasurer, G. H. Burgar, Welland, Ont.; Chief Engineer, J. E. Gardiner, A.M. Can. Soc. C.E., Niagara Falls, Ont; Solicitor, G. H. Pettit, Welland, Ont. (Apr., pg. 197.)

Niagara, St. Catharines and Toronto Ry.—The St. Catharines, Ont., city council decided, April 2, to obtain counsel's opinion on the question of the franchise held by the company in certain parts of the city. The company contends that the franchise is self-renewing every 20 years unless the city takes over the operation of the line on the expiry of the 20-year period. The present franchise expires Dec., 1913. (Dec., 1910, pg. 1171.)

Ottawa and Lake McGregor Ry.—The Dominion Parliament has incorporated a company with this title to build an electric railway from Ottawa to Lake McGregor, Que. (April, pg. 197.)

The Ottawa and St. Lawrence Electric Ry.'s franchise is reported to have been acquired by J. A. Morden and Co., Ottawa, as well as that of the North Lanark Ry., for British financial interests. The company proposes to build a line from Ottawa to Morrisburg, thence along the St. Lawrence River to Brockville, then northerly through Perth and Lanark, to Arnprior, and then along the Ottawa River to Ottawa, a total length of 274 miles. (May, 1910, pg. 455.)

The North Lanark Ry. was incorporated by the Ontario Legislature in 1899 to build a railway from near Mile Lake on the Kingston and Pembroke Ry., to the Canada Atlantic Ry. or the C.P.R., near Arnprior, Ont., the line to be operated either by steam or electricity. In 1903 an amending act was obtained authorizing a change in the location of the line from Blythfield tp. to Ottawa, and authorizing the construction of the line along highways in the event of electricity being used as a motive power. Some surveys were made in 1905, and plans were filed with the Minister of Public Works for Ontario in 1906, but nothing was done.

A meeting of shareholders was held at Arnprior, April 9, for the purpose of passing resolutions for the financing of the construction of the line. (Feb., 1909, pg. 103.)

Niagara, Welland and Lake Erie Electric Ry.—We have been informed that this company has a mile and a half of line "in the town of Welland running as a street railway." (Feb., pg. 91.) See also Niagara Falls, Welland and Dunnville Electric Ry.

North Bay, Ont.—The town solicitor of North Bay, Ont., is reported to be about to apply for a charter to build an electric railway to connect North Bay with Collander, Trent Mills and Sturgeon Falls.

Ottawa Electric Ry.—It was reported, April 10, that the Dominion Government had declined to grant permission to the company to lay tracks on Wellington St., Ottawa. The object in view in endeavoring to obtain a line on this street is to relieve the present congestion of traffic at the corner of Bank and Sparks streets. (April, pg. 197.)

Port Arthur and Fort William Electric Ry.—It is proposed to change the location of the shops in Port Arthur, Ont., from Elgin St. to River St., and from James St. to Wolseley St. (April, pg. 197.)

Quebec Ry., Light and Power Co.—The mayor of Quebec stated, April 2, that he had been advised instructions had been given for the immediate starting of construction of the line in Lincoln and St. Malo, Que. (Mar., pg. 149.)

Rainy River Radial Ry.—The Dominion Parliament has extended the time within which the company may build its projected lines radiating from Kenora, Ont. (Feb., pg. 91.)

Rainy River Radial Ry.—The Dominion Parliament has voted a subsidy for the building of a line from near Fort Frances to the mouth of Little Grassey River, Ont., not exceeding 50 miles.

Rural Ry. of Manitoba—The Manitoba Legislature has amended the company's charter in certain details, notably giving power to amalgamate with other companies; to operate on lines in Winnipeg subject to an agreement with the Winnipeg Electric Ry., and subject to the consent of the city. The company is also authorized to build extensions of its lines upon the approval of the Lieut.-Governor in council, and its capital is increased to $10,00,000. (Feb., pg. 91.)

St. Thomas St Ry.—The St. Thomas, Ont., city council, April 10, passed resolutions for the submission of two by-laws to the citizens, one for the expenditure of $6,000 to build extensions on Ross and William Streets, and the second to expend $24,000 on the purchase of three new cars, to provide electric equipment for three other cars, and for other improvements on existing lines. (April, pg. 197.)

St. John Ry.—We are officially advised that negotiations have been completed between the company and the New Brunswick Government for crossing the new cantilever bridge to be erected at the reversible falls. The company will have a double track line on the centre of the bridge, which will also have a roadway on either side of the tracks for vehicles, and pathways for foot passengers. It is likely that the bridge will be started during the summer.

The General Manager is quoted as having recently stated that ties are on hand for the extension of the tracks to Kane's corner, that the other materials are being delivered and that the extension of the line to Rothesay will be started at an early date. (Dec., 1910, pg. 1173.)

Saskatoon Electric Ry. and Power Co.—The provisional directors named in the act of incorporation are:——H. M. E. Evans, W. D. Woodhead, J. H. M. Emsley, Edmonton, Alta.; B. M. Wakeling, P. D. Tanner, Saskatoon, Sask.

The Dominion Parliament has passed an act confirming the charter of the Saskatoon Power Co. and extending the time within which the development of the water power on the Saskatchewan River might be proceeded with. The S. P. Co. is controlled by H. M. E. Evans of Edmonton, Alta., and others. (April, pg. 197.)

Sherbrooke Ry. and Power Co.—We are officially advised that the press report referred to in our last issue, that the company proposed building a line to

Stanstead, Que., is incorrect. (April, pg. 197.)

Three Rivers Tramway Co.—The Quebec Legislature has incorporated a company with this title to build an electric railway in the city of Three Rivers. (April, pg. 197.)

Windsor, Chatham and London Ry.—The Dominion Parliament has authorized the company to issue bonds for $25,000 a mile of single track built, and has granted an extension of time for the building of the authorized lines. (Dec., 1910, pg. 1173.)

Winnipeg Electric Ry.—The Manitoba Legislature has authorized the company to sell any part of its undertaking. It also sought power to build elevated and underground lines in the city. This was objected to and after a considerable discussion terms were arranged, and certain extra powers were given. An agreement between the company and the municipal council of Kildonan, as to extensions of lines, etc., was also confirmed.

The Manitoba Legislature has confirmed agreements between the Winnipeg, Selkirk and Lake Winnipeg Ry. company and the town of Selkirk for the sale of power, and with the rural municipalities of Stonewall and Rockwood for the extension of its lines to Stoney Mountain. The W.S. and L.W. Ry. is owned by the Winnipeg Electric Ry. (April, pg. 198.)

Among the Express Companies.

The Canadian Northern Ex. Co. has opened offices at Kingston, Ont., Woodnorth, Man., Munson, Alta., and has closed its offices at Rhein, Sask., at Steep Rock, Ont., and Mistatim, Sask.

E. E. McIntosh, a former C.P.R. brakeman, was recently arrested at Ogdensburg, N.Y., and taken to Toronto, on a charge of stealing 4.000 partially signed bank notes of the Traders Bank from the Dominion Ex. Co., while in transist from Ottawa to Toronto, Mar. 30, 1909.

F. W. Atherton, formerly senior purser on the C.P.R. s.s. Empress of Ireland, who was recently arrested in Chester, Eng., and charged at London with theft of £3,400 from the Dominion Ex. Co., is to be transferred to St. John, N.B., for trial. the alleged theft having been committed within Canadian jurisdiction

E. P. Newhall, who has been appointed General Freight and Passenger Agent, Alberta Interurban Ry., Calgary, Alta., was connected with the Pacific Express Co. in various capacities for the past 25 years. For the past 12 years he was Superintendent at Toledo, O., and left the company, when the control passed into other hands, in Aug., 1911.

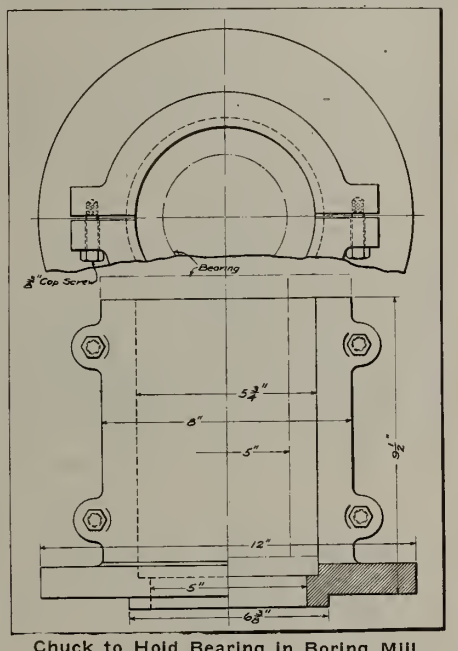
The Board of Railway Commissioners has issued order 16331, Apr. 18, amending order 13,357, Mar. 30, 1911, which ordered express companies under its jurisdiction. to collect and deliver traffic, from and to all points within the municipal boundaries or limits of all cities, towns and villages, by adding the following clause:—"Express companies are absolved from making delivery under the terms of this order where the condition of the roads or streets is not in a reasonably passable state for vehicular traffic."

James Bryce, who has retired from the position of Vice President and Manager. Canadian Ex. Co.. under the provisions of the pension rules. was born at Galt, Ont., Mar. 30, 1846, and commenced express service with the Canadian and American Ex. Cos. He served at Dundas. Hamilton, Guelph and Toronto, and from 1882 to 1889 was Superintendent. Intercolonial Ex. Co.. at St. John, N.B. He was appointed General Superintendent, Canadian Ex. Co., at Montreal in 1889, and was eventually appointed Vice President and Manager, which position has now been abolished.

Boring Large Bearings at the Halifax Electric Tramway Co's. Shops.

In The Railway and Marine World for April, the method of boring small journals in use at the Halifax Electric Tramway Co.'s shops, was outlined. A somewhat different method is followed for the larger journal bearings, this process being here described.

As will be remembered, a specially designed and constructed jig was used in the drill press; but in this case a much simpler jig is employed on a 30-in. vertical boring mill. The design of this jig is outlined in the accompanying illustration, where a bearing is shown mounted therein. The 6⅜-in. boss on the lower face of the jig fits into a corresponding recess in the centre



Chuck to Hold Bearing in Boring Mill.

of the boring mill table, to which the jig is bolted. The jig is made in two sections—one solid with the base, and the other secured to the solid section by bolts, so that the contained bearing may be securely clamped in place for machining.

To catch the falling chips or cuttings. a cylindrical can of sheet iron was made of correct diameter to fit loosely into the hollow spindle of the boring mill table. The upper end is open, and has a flanged edge fitting into a shoulder at the top of the spindle hole. This is placed in position previous to mounting the jig in place on the table. The brass cuttings are thus saved in a very simple manner, much of the usual loss from this source being done away with. This saving is particularly noticeable where the machine is frequently changing from one metal to another, in which case sufficient cuttings will not have dropped between changes to make it worth while cleaning up the shavings from under the mill. This can, being loose, is removable at will.

The jig requires no careful adjusting on mounting, the boss on the base fitting directly into the recess of the table, automatically lining up the jig into a correct central position. Consequently it is almost as convenient to use it for only one journal as for several. the time of setting up being so short.

Canadian Street Railway Association.

PRESIDENT, James Anderson, General Manager, Sandwich, Windsor and Amherstburg Ry.; VICE PRESIDENT, P. Dubee, Secretary Montreal Tramways Co.; SECRETARY-TREASURER, Acton Burrows, Managing Director, The Railway and Marine World.

ASSOCIATION'S OFFICE, 70 Bond St., Toronto.

EXECUTIVE COMMITTEE.—E. P. Coleman, Manager of Railways, Dominion Power and Transmission Co.; H. M. Hopper, General Manager, St. John Ry.; J. E. Hutcheson, Superintendent, Ottawa Electric Ry.; C. B. King, Manager, London St. Ry.; D. McDonald, General Manager, Montreal Tramways Co.; M. N. Todd, President, Galt, Preston and Hespeler St. Ry.

ASSISTANT SECRETARY, Aubrey Acton Burrows, Secretary and Business Manager, The Railway and Marine World.

OFFICIAL ORGAN, THE RAILWAY AND MARINE WORLD.

Brakeshoe Tests.—Some interesting results have been obtained by the Brooklyn Rapid Transit System in a series of tests of brakeshoes conducted by G. L. Fowler. The suggestion was made as a result of these tests that no chemical requirements be introduced into brakeshoe specifications, although it was ascertained that the best results were obtainable if the carbon of the shoe is evenly balanced between the combined and graphitic so that half appears in each form. Close attention should be paid to the condition of the brakeshoe rigging to insure a uniform pressure and wear on each side. Four types, chilled end and unchilled, with steel backs, were tested, the deduction resulting in the conclusion that both the co-efficient of friction and hardness are matters of apparently minor importance. Best results were obtained with the hardness around 275 of the Brinnell scale. Chilled-end shoes had a longer life, but where shoes were purchased on the mileage basis, it was considered preferable to have them unchilled, even at a slightly higher cost, due to greater co-efficient of friction and increased life of the wheels.

Co-operative Tie-treating Plants for the joint use of a group of electric railways which are too small individually to have plants of their own, have been suggested. The suggestion was made by F. P. Smith. Superintendent of Way and Structures of the Indianapolis. Columbus and Southern Traction Co., in a paper read at the Central Electric Railway Association's annual meeting. He did not consider it advisable for a railway having less than 100 miles of track to establish a timber-treating plant. but thought that electric railways in the same territory might co-operate in the construction and operation of such a plant. Not only the treatment but also the purchase and inspection of timber for ties and other purposes could be handled economically through such a central plant.

The Canadian Traffic Bureau has been incorporated under the Manitoba Companies Act with a capital of $15,000 and office at Winnipeg, to adjust and otherwise handle traffic and railway claims of every nature, and kindred objects. The provisional directors are:—C. R. Blackburn, W. S. Boyd. H. M. Bickford, C. J. Jamieson, N. K. Boyd, Winnipeg.

The fire which occurred at the Oshawa Ry. car barns at the end of Madch. destroyed the entire barn, together with all tools and spare equipment, about one-half of the station building, and two large ouble truck closed cars, one closed single truck passenger car, one freight shunter and one sweeper. We are advised that the buildings will be immediately replaced by up to date fire proof structures. and new equipment is being secured as speedy as possible. It was reported. Apr. 22, that four convertible cars and a shunter had been ordered in the U.S., it being impossible to obtain delivery as soon as required, if ordered in Canada.

Marine Department

Harbor Improvements, Dry Dock and Ship Repairing Plant at St. John.

The illustration published in The Railway and Marine World's April issue gave a good general idea of the harbor improvements, etc., at Courtenay Bay, St. John, N.B., for which the Dominion Government has awarded a contract to Norton Griffiths and Co., Ltd. (Canada). The works, the whole of which are to be completed by March 30, 1917, embrace:—

The construction of a breakwater 4,570 ft. long, including that of five groynes each 150 ft. long.

The dredging of a channel about 6,800 ft. long and 500 ft. wide at bottom to a depth of 32 ft. below low water, from the main ship channel leading into the St. John River to the head of the breakwater mentioned above.

The dredging of a basin to a depth of 32 ft. below low water in Courtenay Bay.

The construction of about 4,890 lineal ft. of quay walls.

The filling of an area of about 28 acres.

The construction of a dry dock of the first class.

The work on the breakwater, dredging, quay walls and filling is at schedule prices and is estimated to amount to $7,500,000 as per table appended hereto. The dry dock is to be built under the provisions of the Dry Dock Subsidies Act, 1910, and together with its plant is to be kept in working order and in repair by the contractors during the term of the subsidy. The estimated cost is $4,500,000, on which the Government will pay a subsidy of 3½% for 35 years. There will be a ship repairing plant in connection, which will also be operated by the contractors.

Tenderers were required to deposit an accepted cheque for $500,000. One half of the contractor's deposit will be returned if half of the whole work is satisfactorily completed within two years. Ninety per cent. of the progress estimated will be paid weekly and an advance of 50% of the actual cost of material delivered will be made.

Norton Griffiths and Co., Ltd. (Canada) head office is in Vancouver, B.C., with another office at 28 Victoria Square, Montreal. The President is J. Norton Griffiths, member for Wednesbury in the British House of Commons; the Managing Director, W. Burton Stewart, and the Chief Engineer, P. R. Warren. The St. John works will be under the direct charge of G. F. Palmer, C.E., who will have charge of construction, with the title of Contractors' Agent. It is probable that the contractors will sublet the rock excavation and the breakwater. Work will be started almost immediately.

The complete scheme, as laid out for the future, encloses an area of approximately 400 acres by means of a breakwater 4,570 ft. long. The area of the harbor is to be dredged to 32 ft. below low water, and is to be increased later on to 36 ft. The entrance channel, 6,800 ft. long and 500 ft. wide at the bottom, will also be dredged to a similar depth in two operations. In the first operation it is to be dredged to 15 ft. below low water, and its whole length and width, the balance to be done at the second operation. The dredging plant, composed of suction and bucket type dredgers, will be large and modern and capable of dredging to a depth of 65 ft.

A large area will be reclaimed for railway terminals and wharves on the city side of the bay, adjoining the Intercolonial tracks, and according to the complete plan some 22 berths will be provided, for vessels from 700 to 1,000 ft. long. The present contract includes nearly 5,000 ft. of wharves.

The main entrance to the harbor between this reclaimed land and the end of the breakwater will be about 1,600 ft. The dry dock will be built on the north east side of the bay, but the exact location has not been definitely fixed. This dock will be 900 ft. long, 110 ft. wide at the entrance and 35 ft. depth of water on sill at high water.

A reclamation will be made of sufficient size to allow for a shipyard and repair shops. The plans of the shops show that the plant is to be erected on a large scale, up to date, and equipped with the most powerful of modern machinery, so that the largest ships, such as those which ply between America and Great Britain, may be handled with ease.

The carrying out of the work will be proceeded with as follows: During the first year over 1,000,000 yards of rock will be required to form the breakwater and the rubble slopes around the land to be reclaimed for the site which is to be used for the ship repair yard, and which will adjoin the dry dock. The surface of this reclaimed land will be raised to 10 ft. above high water. The slopes of the breakwater will be 1 to 1 on the harbor side and 2 to 1 on the seaward side. The top level of the breakwater will be 7 ft. above high water and will be 20 ft. wide.

During the second year the dredging of a temporary channel leading to the site of the quay walls near the I.R.C. tracks towards the head of the breakwater, and also to the site of the dry dock will be proceeded with. The material raised by the suction dredger will be pumped by pipe line on to the site of the ship repair yard or else taken to sea. The dredging for the quay walls will be carried down to 39 ft. below low water and rubble will be deposited 5 ft. deep for the foundation of the cribwork The cribs, which are to be made of birch timber, will be 48 ft. wide on the base, 43½ ft. high and 120 ft. long. They will be built on a convenient part of the foreshore nearby, floated into position and sunk. The face timbers of the cribs will be 2 ft. thick and the base or platform of the crib will be one foot thick. The upper portion of the cribs will be finished off with a timber platform 10 ins. thick, on which will be constructed a wall or concrete superstructure 26½ ft. high and 18 ft. wide on base.

The filling behind the cribs and portion of land adjoining the quay walls will be reclaimed by depositing the dredgings from the basin. 4,734 lin. ft. of quay wall will be constructed in this way, giving 32 ft. at low water for vessels lying alongside and berths from 700 to 1,000 ft. long. 1,800 ft. of the breakwater will be formed of cribwork and carried out at the same time as the similar work for the quay walls. The superstructure will be of plain and reinforced concrete. The shore end of breakwater for 2,770 ft. will be constructed entirely of rubble.

With the protection of the breakwater completed the dredging of the entrance channel and basin will be carried on with suction and bucket dredges until a depth of 32 ft. below low water has been obtained, the dredged material being used in the reclamation work of the shipyard and berths near the I.R.C. tracks as required, the remainder being taken to sea. The total amount of dredging in channel and basin is 10.-000,000 cu. yds.

The construction of the dry dock will then be well in hand. The side walls and bottom will be of 6 to 1 concrete.

SCHEDULE OF PRICES FOR BREAKWATER, DREDGING, QUAY WALLS AND FILLING.

Crib work in breakwater, in place, fully bolted and ballasted, and ready to receive concrete superstructure, per c. yd.	146,000	c. yds.	$ 4 50	$ 657,000
Pile groynes, in place, fully completed, including stone rip-rapping on the two sides of each groyne, per lin. ft.	750	l. ft.	60 00	45,000
Crib work in breakwater, including piling at outer end of portion of breakwater built of stone, in place, fully bolted and ballasted, per c. yd.	4,000	c. yds.	5 125	20,500
Concrete footing blocks in breakwater, in place, ready to receive the mass concrete, per c. yd.	11,000	"	10 00	110,000
Mass concrete in breakwater, in place, per c. yd.	30,000	"	8 00	240,000
Reinforced concrete flooring in breakwater, in place, including pillar in centre of crib, all completed, per c. yd.	4,000	"	18 00	72,000
Large stone for covering top and all slopes of breakwater, 2 tons, 3 tons and 5 tons weight, in place, per c. yd.	70,000	"	3 80	266,000
Small stone for breakwater, in place, per c. yd.	190,000	"	2 50	475,000
Dredging for foundation of crib work in breakwater. This only includes quantities below 32 ft. below low water, per c. yd.	65,000	"	0 50	32,500
Stone foundation for crib work in breakwater, in place, per c. yd.	27,000	"	2 00	54,000
Crib work in quay walls, in place, fully bolted and ballasted and ready to receive concrete superstructure, per c. yd.	303,000	"	4 75	1,439,250
Concrete footing blocks in quay walls, in place, ready to receive the mass concrete superstructure, per c. yd.	17,700	"	11 00	194,700
Mass concrete in quay walls, in place, per c. yd.	46,700	"	8 50	396,950
Dredging for foundation of crib work in quay walls, below 32 ft. depth only, per c. yd.	150,000	"	0 60	90,000
Stone for foundation of crib work in quay walls, in place, per c. yd.				
Bollards in breakwater and quay walls, in place, each	73,000	"	2 50	182,500
Dredging channel in Courtenay Bay, per c. yd.	100	bollards.	146 00	14,600
Dredging basin in Courtenay Bay, material to be dumped at sea, 2½ miles tow, per c. yd.	4,000,000	c. yds.	0 31	1,240,000
Dredging basin in Courtenay Bay, material to be used for filling, price to include cost of dredging and cost of filling, per c. yd.	3,500,000	"	0 24	1,200,000
*Rock in channel basin, or under quay walls, removed and placed where directed, per c. yd.	1,500,000	"	0 50	750,000
	1,000	"	20 00	20,000
				$7,500,000

*The prices for this last item "Rock" to be as per the following scale in accordance with the quantity removed. For any quantity under and up to 1,000 cubic yards, $20; for any quantity under and up to 5,000 cubic yards, $15; for any quantity under and up to 10,000 cubic yards, $12; for any quantity under and up to20,000 cubic yards, $10; for any quantity up to and over 50,000 cubic yards, $8.

and where the concrete and rock join each other a seal of 4 to 1 concrete will be placed right along the sides of the dock. The face work of all concrete or the inside of the dock will be of 4 to 1 concrete 6 in. thick. The copings 3 ft. x 2½ ft., and altars 2½ ft. x 1 ft., will be of the same quality of concrete. A keel block course, 9 ft. wide and two bilge block courses 6 ft. wide by 21 in. thick will be put along the floor of the dock.

The dock will be 900 ft. long with an entrance of 110 ft. and depth of water over sill of 35 ft. at high water. An outer caisson stop will be provided which will increase the length of the dock to 923½ ft. The entrance to the dry dock will be closed by a ship caisson 110 ft. wide and 44½ ft. high. The deck will be 15 ft. wide and will have a track to allow railway traffic to be transferred from one side of the dock to the other.

The water from the dock will be discharged into the basin by three electrically driven pumps of the centrifugal type, 54 in. dia., which will empty the dock when full in three hours. The water from the dock will pass through an emptying culvert 12½ ft. x 8 ft. into the suction culvert 20 ft. x 16½ ft. high. The water will then pass through the pumps to a main discharge chamber and then into the non-return valve chamber. From this basin the water will pass through two 10 ft. dia. culverts to the basin. The main pumps will lower the water to the floor level of the dock, the remainder being pumped out by a smaller drainage pump, also of the centrifugal type. The water will be let into the dock through two filing culverts 8 ft. high by 5 ft. wide, situated on each side of the entrance. The emptying and filling culverts will be provided with the necessary penstocks, which are worked electrically. The pump house, near the entrance to the dock, will be 80 x 50 ft., and the floor level 8 ft. above the level of low water.

On the site for the shipyard which is to be reclaimed, repair shops, including machine, platers, boiler shops, etc., will be built and fitted up with machines and tools for repairing vessels.

An order in council has been issued amending article 4 of the bylaws of the pilotage district of Quebec, providing that apprentice pilots after completing their seven years of apprenticeship, with the necessary ocean going voyages, shall hold a mate certificate, coasting, instead of a certificate of first mate seagoing competency.

Repairing Cracked Valve-Chest Steam Pipe on Car Ferry Scotia.

Somewhat over a year ago the Intercolonial Ry.'s car ferry Scotia, used to ferry trains across the Strait of Canso, met with an accident consisting of a cracked valve-chest steam pipe. The approximate extent of the fracture is shown in the illustration, fig. 1, the view to the left representing the pipe from the steam chest before being repaired.

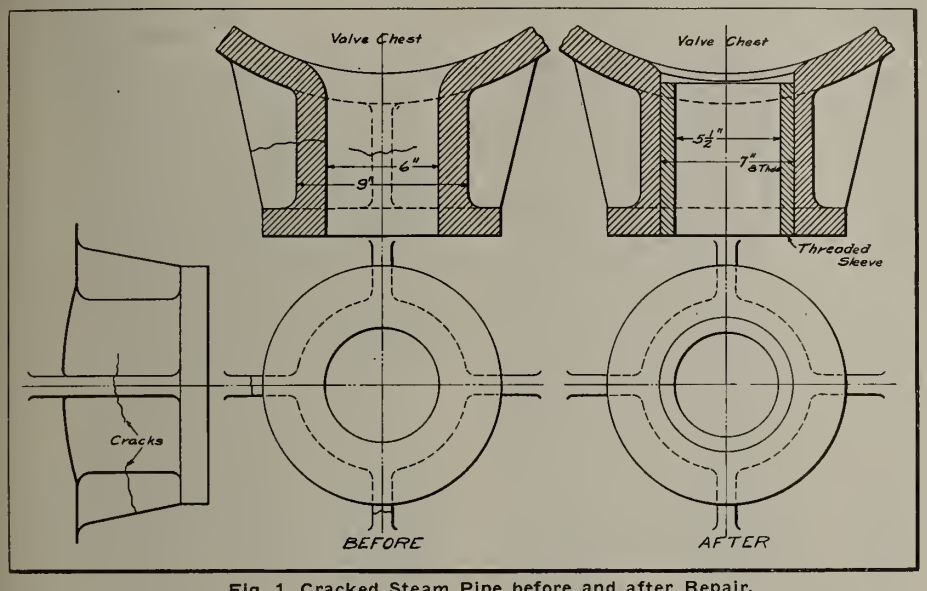


Fig. 1. Cracked Steam Pipe before and after Repair.

The pipe, ribbed at four sides, had two adjacent ribs cracked through, the fissures extending a short distance on each side of the ribs, but not meeting, a solid strip intervening between the cracks, as the illustration indicates.

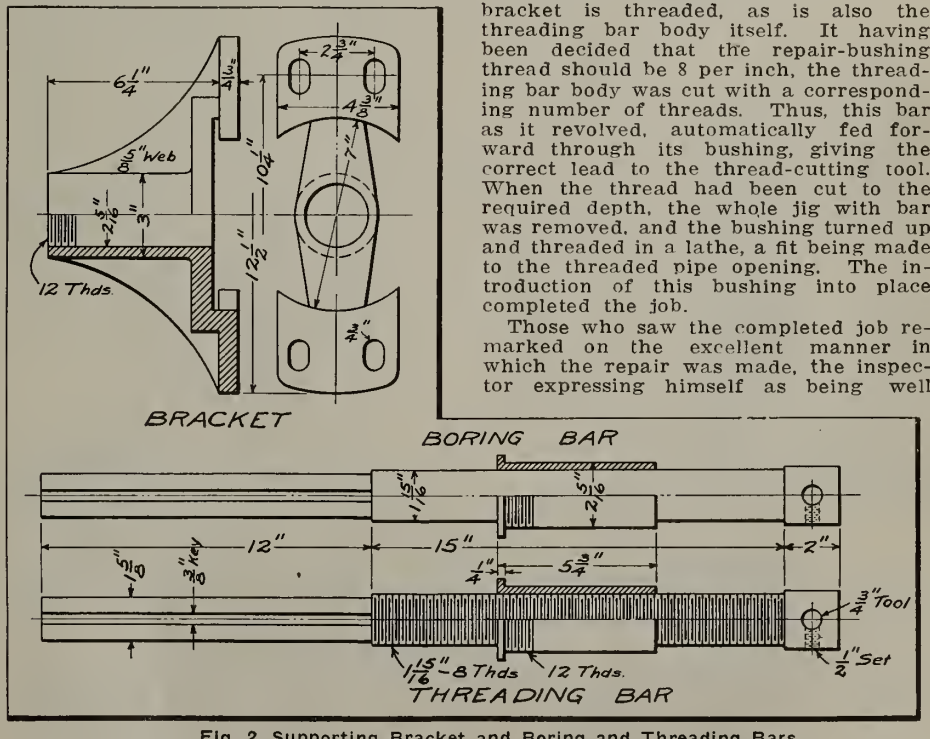


Fig. 2. Supporting Bracket and Boring and Threading Bars.

As too much time would be required to cast and machine a new cylinder and chest, some method of repair had to be immediately improvised, as the ferry must of necessity be kept out of service as short a time as possible. The cylinder was taken to the I.R.C. Halifax shops, these being the nearest, and the repairing was placed in the hands of W. Peveril, one of the machinists. He devised a method of repair which, considering the limited facilities at hand, was both novel and ingenious. This consisted of boring out the pipe opening from its original 6 ins to about 7 ins., threading this bore, and fitting in a threaded sleeve having a 5½-in. inside diameter, all as indicated to the right in fig. 1.

This method, after suggesting itself to Mr. Peveril, next required some careful planning before being executed, as the machinery in the Halifax shops is all rather small, with neither a lathe nor boring mill capable of handling anything quite so large. Consequently, special tools, simple in form, had to be made. The more important of these are shown in fig. 2. A supporting bracket of the form indicated was made, of a size to be bolted to the face of the pipe flange. This was bored to a 2 5-16-in. diameter, for a boring bar support, the support being 6 ins. long. A boring bar of the form shown was held in this bracket in a bushing screwed into the bracket bore, and was made a snug working fit in this bushing, so that no play in the bar would exist when working forward during the machining operation. In the forward end of the bar a ¾-in round boring tool was held radially in the bar by a ½-in. set screw. The bar was driven from the keyway end by an air motor through a train of gears mounted on an improvised wrought-iron frame; these gears were old lathe change gears, pressed into service for the occasion. The bar was fed forward in its supporting bracket by a screw bearing against the rear end from an outside block, temporarily placed for the purpose, the screw being given a turn each revolution of the bar. As previously mentioned, about ½-in. of metal was removed from each side.

A very similar bar was made for the threading, having the same general dimensions, the only difference being that the bushing which supports it in the bracket is threaded, as is also the threading bar body itself. It having been decided that the repair-bushing thread should be 8 per inch, the threading bar body was cut with a corresponding number of threads. Thus, this bar as it revolved, automatically fed forward through its bushing, giving the correct lead to the thread-cutting tool. When the thread had been cut to the required depth, the whole jig with bar was removed, and the bushing turned up and threaded in a lathe, a fit being made to the threaded pipe opening. The introduction of this bushing into place completed the job.

Those who saw the completed job remarked on the excellent manner in which the repair was made, the inspector expressing himself as being well pleased with the way in which the task had been performed. Had such a plant been at hand it would seem to have been a splendid place to apply oxy-acetylene welding, this having been used to advantage under very similar circumstances on numerous occasions

Keystone Transportation Co. Orders Another Vessel.

The Keystone Transportation Co., Montreal, has ordered a full sized canal steamboat with the following dimensions:—Length over all, 258 ft.; length between perpendiculars, 250 ft.; breadth moulded, 42½ ft.; depth moulded, 20 ft. The vessel is to be practically a duplicate of the company's steamboat Keystorm, with such modifications as are required by the builders to meet their standard practice. She will be built on the channel system of framing, having very large fore peak tank and deep water bottoms. The hold will be divided in three compartments by two steel watertight bulkheads. She will be rigged with two steel masts and three cargo derricks and the necessary winches. Accommodation for the captain will be provided in the texas forward in the usual way. Under the forecastle deck on the port side will be the accommodation for the officers and crew, and on the starboard side commodious quarters will be provided for all departments, both forward and aft; also bathrooms

List of Steam Vessels Registered in Canada during January, February and March, 1912

Name	No.	Where and When Built.	Engines, etc.	Length	Breadth	Depth	Gross Tons	Reg. Tons	Port of Registry	Owners
A. C. Newhall	85,409	Salisbury, Mass., 1858	sc 5 nhp.	63 6	18 3	6 3	32	30	Magdalen Islands	Eastern Canada Fisheries, Ltd., Montreal
Aquilo	130,842	South Boston, Mass., 1901	" 28 "	127 4	20 0	11 3	176	104	Vancouver, B.C.	B. T. Rogers, Vancouver, B.C
Asapb F.	130,737	Little Tancook, N.S., 1911	" 1 "	43 6	10 8	6 6	15	14	Lunenburg, N.S.	A. Fleet, Blandford, N.S.
Centre Star	130,849	Vancouver, B.C. 1912	" 8 "	50 5	13 4	6 4	39	27	Vancouver, B.C.	W. S. Nicholls, Vancouver, B.C.
Cheerful	130,493	Fraser Mills, B.C. 1912	" 28 "	73 4	18 0	7 8	80	42	N.Westminster, B.C	Canadian Tug Boat Co., Vancouver, B.C.
Chelohsin	130,805	Dublin, Ireland, 1911	" 131 "	175 5	35 1	14 0	1134	597	Vancouver, B.C.	J. H. Welsford, Liverpool, England
Cohoe	130,852	Seattle, Wash., 1911	" 2½ "	44 6	12 6	4 9	19	13	" "	Wallace Fisheries, Ltd., Vancouver, B.C.
Don 2	130,844	Lund, B.C., 1911	" 1½ "	33 8	8 6	3 7	10	7	" "	W. R. Armson, Lund, B.C.
Dragon Fly	130,615	Bay City, Mich., 1911	" 2½ "	39 4	10 6	5 0	15	9	Victoria, B.C.	L. O. Garnett, Cobble Hill, B.C.
Emoh	130,845	Vancouver, B.C., 1812	" 2½ "	44 0	11 0	4 8	17	12	Vancouver, B.C.	R. W. Holland, Vancouver, B.C.
Enola	130,808	Ballard, Wash., 1902	" 8 "	43 4	13 2	6 2	26	18	" "	T. Duke and J. McArthur, Vancouver, B.C.
Epauline	130,804	Vancouver, B.C., 1911	" 3½ "	68 0	17 0	8 0	57	44	" "	S. L. Howe, Vancouver, B.C
Fearful	130,494	Fraser Mills, B.C., 1912	" 28 "	73 4	18 0	7 8	80	42	N.Westminster, B.C	Canadian Tug Boat Co., Vancouver, B.C.
Flower of Buchan	130,853	Steveston, B.C., 1912	" 1 "	37 0	9 2	3 1	8	5	Vancouver, B.C.	J. Winter. *et al.* Vancouver, B.C.
Francis Idaho	130,846	Vancouver, B.C., 1911	" 7½ "	37 5	11 0	5 0	14	10	" "	A. Gill, Vancouver and L. Godtel, West Sooke, B.C.
Full Moon	130,847	" " 1912.	" 2½ "	48 0	10 5	5 3	24	16	" "	K. Walkem, Vancouver, B.C.
George V	122,295	Prince Albert, Sask., 1911	" 4 "	110 0	26 7	4 0	105	66	Prince Albert, Sask.	City of Prince Albert, Sask.
Gilford	130 806	Seattle. Wash., 1907	" 2 "	39 1	12 4	4 6	18	12	Vancouver, B.C	Gilford Fish Co., Vancouver, B.C.
Glenboro	130,800	Vancouver, B.C., 1912	" 13 "	64 0	17 3	8 6	74	50	" "	W. McRae and R. Johnson, Vancouver, B.C.
H. C. M. No. 1	130,406	Montreal, 1868	" 7½ "	84 0	24 0	8 2	135	72	Montreal	Harbor Commissioners of Montreal
Iance	130,612	Simpson, B.C., 1911	" 1 "	38 7	9 2	3 7	13	9	Victoria, B.C.	C. A. Gardner, Victoria, B.C.
Kitwinmar	130,801	Seattle, Wash, 1912	" 1 "	43 4	12 2	4 6	15	10	Vancouver, B.C	E. McMillen, North Vancouver, B.C.
Lady Lake	130,802	Ballard, Wash., 1896	" 16 "	58 2	15 0	6 7	56	38	" "	C. E. Strong, Vancouver, B.C.
Letitia-Sophia	130,614	Victoria, B.C., 1910	" 1 "	30 4	8 2	3 4	6	4	Victoria, B.C.	A. H. Aldridge, South Pender Island, B.C.
M. F. Co. No. 2	130,803	Decatur, Wash., 1907	" 7 "	57 7	11 5	4 9	33	22	Vancouver, B.C.	Metropole Transportation Co., Vancouver, B.C.
Multke	130,810	Steveston, B.C., 1911	" 1 "	38 0	9 0	3 7	9	7	" "	D. Jureit, Steveston, B.C.
Olive M	130,611	Victoria, B.C., 1911	" 30 "	78 0	22 0	10 0	134	63	Victoria, B.C.	Vancouver Island Towing Co., Vancouver, B.C.
Orlonah	130,807	Vancouver, B.C., 1910	" 2 "	40 0	10 1	5 0	17	12	Vancouver, B.C.	J. J. Banfield, Vancouver, B.C.
Port Mann No. 1	130,850	" " 1911	" 2 "	40 0	9 0	4 6	13	9	" "	A. H. Bowell, " "
Princess Patricia	115,685	Dumbarton, Scotland, 1902	" 450 "	270 0	32 1	11 0	665	52	Victoria, B.C.	C. P. R. Co., Montreal
Restigouche	130.642	Kinderdyk, Holland, 1900	" 60 "	156 0	33 0	10 2	470	319	Ottawa	Minister of Public Works, Ottawa
Sedar Isle	116,305	Charlottetown, P.E.I., 1905 Falconwood, P.E.I., 1911	" 1 "	25 3	7 8	3 0	3	2	Charlottetown, P.E.I.	V. L. Goodwill, Charlottetown, P.E.I.
Tamerlane	130,841	North Vancouver. B.C., 1910	" ½ "	21 6	9 0	3 4	4	3	Vancouver, B.C.	W. G. Breeze, Vancouver, B.C.
Traversier No. 1	126,856	Sorel. Que., 1911	" 1 "	50 3	26 1	3 3	37	31	Sorel, Que.	J. Salvail, Sorel, Que.
Venture	129,475	Old Kilpatrick, Scot., 1910.	" 171 "	180 4	32 1	17 0	1011	580	Victoria, B.C	Boscowitz Steamship Co., Victoria, B.C.
W. No. 1	130,851	Seattle, Wash., 1911	" 2½ "	50 0	13 3	4 8	27	19	Vancouver, B.C.	Wallace Fisheries, Ltd., Vancouver, B.C.
We Lead	130,798	Vancouver, B.C., 1910	" 3 "	32 0	8 5	3 2	9	6	" "	A. B. Bettes, " "
Wyrill	130,799	" " 1911	" 3 "	48 8	11 0	4 8	23	16	" "	W. A. Bauer, " "
Zelma T. Young	130,813	Little Tancook, N.S., 1912	" 1 "	43 6	10 8	6 9	16	16	Lunenburg, N.S.	V. Zinck, M.O., Blandford, N.S.

List of Sailing Vessels and Barges Registered in Canada during January, February and March, 1912

Name	No.	Where and When Built	Rig	Length	Breadth	Depth	Reg. Tons	Port of Registry	Owners
Ada. M. Westhaver	130.739	Mahone Bay, N.S., 1911	Schr	114 3	26 0	10 2	100	Lunenburg, N.S.	D. Westhaver, M.O., Lunenburg, N.S
Albert A. Young	130,740	" " " "	"	94 8	25 0	10 3	92	" "	J. Hiltz, M.O., Indian Point, N.S.
Araucania	130,818	" " " "	"	103 0	25 5	10 5	92	" "	M Rodenheizer, M.O., Lunenburg, N.S.
B. Jax	130,489	New Westminster, B.C., 1911.	Barge	95 0	32 0	9 0	249	N. Westminster, B.C.	A. M. Garnett, Victoria, B.C.
Barracouta	130,426		Sloop	32 2	10 5	4 3	9	St. Andrews, N.B.	W. Hope, Montreal
C. B. No. 1	130,843	Vancouver, B.C., 1911	Scow	80 2	35 0	6 0	223	Vancouver, B.C.	Columbia Bitulithic, Ltd., Vancouver, B.C.
D. 3	130,836	Fort William, Ont., 1911	"	80 0	28 0	5 0	104	Port Arthur, Ont.	Great Lakes Dredging Co., Port Arthur, Ont.
D. 4	130,837	" " " 1910	"	75 0	28 0	5 5	98	" " " "	" " " "
D. 25	126,675	" " " 1909	"	94 0	24 0	7 8	149	" " " "	" " " "
D. 26	126,676	" " " 1909	"	95 6	24 0	7 6	149	" " " "	" " " "
D. 34	126,677	" " " 1909	"	121 5	29 0	9 2	272	" " " "	" " " "
D. 35	126,678	Port Arthur, Ont., 1909	"	122 4	28 8	9 4	278	" " " "	" " " "
D. 38	126,679	" " " 1910	"	149 0	36 0	15 5	675	" " " "	" " " "
D. 39	126,680	" " " 1910	"	149 0	36 0	15 5	675	" " " "	" " " "
D. 40	130,831	" " " 1909	"	151 0	36 0	10 8	502	" " " "	" " " "
D. 41	130,832	" " " 1909	"	135 5	36 0	10 8	445	" " " "	" " " "
D. 42	130,833	" " " 1909	"	135 5	36 0	10 8	444	" " " "	" " " "
D. 43	130,834	Fort William, Ont., 1910	"	149 0	36 0	15 5	675	" " " "	" " " "
D. 48	130,835	" " " 1910	"	149 0	36 0	15 5	675	" " " "	" " " "
Donald G. Hollett	130,503	Shelbourne, N.S., 1911	Schr.	111 0	25 2	10 9	99	Shelburne, N.S.	T. V. Hollett, Burin, Nfld.
Edith Adele	130 585	Tancook, N.S., 1912	"	52 6	14 6	7 6	33	Halifax, N.S	J. C. Martin, M.O., Ketch Harbor, N.S.
Ella M. Rudolph	130,504	Allendale, N.S., 1912	"	66 2	18 9	8 2	54	Shelburne, N.S.	W. MacMillan, *et al.*, Lockport, N.S.
Elsie Porter	130,819	La Have, N.S., 1911	"	109 2	26 0	10 8	100	Lunenburg, N.S.	N. Reinhardt, M.O., LaHave, N.S.
Evolution	94,855	Spencer's Island, 1889	"	107 0	28 3	10 5	173	Liverpool, N.S.	Queens County Ry. Co., Wilkins Siding, N.S.
Frances Lenore	130,738	Tancook, N.S., 1911	"	41 6	10 0	5 6	12	Lunenburg, N.S.	R. Garrison, M.O., Indian Harbor, N.S.
Frieda	126,857	Fort Enward, N.Y., 1887 Sorel, Que., 1911	Barge	87 0	17 2	6 2	98	Sorel, Que.	D. Chevrier, St. Joseph de Sorel, Que.
G. Jax	130,490	New Westminster, B.C., 1911.	"	95 0	32 0	9 0	249	N. Westminster, B.C.	A. M. Garnett, Victoria, B.C.
Gladys & Lillian	130,812	Allendale, N.S., 1911	Schr.	88 5	24 8	9 5	84	Lunenburg, N.S.	H. Adams, M.O., Lunenburg, N.S.
Lapewalem	130,664	Rexton, N.B., 1911	"	32 0	12 4	5 0	10	Richibucto, N.B.	J. Doucett, Rexton, N.B.
Leo	85.342	Mahone Bay, N.S., 1882	Bgtn	97 2	24 6	10 8	165	Lunenburg, N.S.	J. L. Publicover, M.O., Dublin, N.S.
Lillian B. Corkum	130,815	Liverpool, N.S., 1912	Schr.	108 7	25 6	10 3	97	" "	W. Corkum, M.O., Lunenburg, N.S.
Lillian M. Richard	130,811	" " 1911	"	108 7	25 6	10 3	98	" "	E. Richard, Jr., M.O. " "
Lottie A. Silver	130,820	" " "	"	108 6	26 0	10 2	99	" "	R. Silver, M.O., " "
Lucille B. Creaser	130,814	Lunenburg, " "	"	106 8	26 3	10 4	99	" "	A. Creaser, " Riverport, "
McBride & Co. 2	130,848	North Vancouver, B.C., 1911.	Scow	73 4	28 0	6 6	123	Vancouver, B.C.	T. G. McBride, M.O., Vancouver, B.C.
Marion Adams	130,816	Lunenburg, N.S., 1912	Schr	106 8	26 3	10 4	99	Lunenburg, N.S.	H. Adams, M.O., Lunenburg, N.S.
Mary E. Rive	130,655	Caraquet N.B., 1911	"	41 5	14 2	6 4	21	Chatham, N.B	H. Rive, Caraquet, N.B.
Matapedia	130,736	Shelbourne, N.S., 1911	"	103 0	26 4	10 6	98	Lunenburg, N.S.	J. Backman, M.O., Riverport, N.S.
Mianus	130,821	Tancook, N.S., 1912	"	45 2	10 8	6 0	15	" "	L. Hubley, Indian Harbor, N.S.
Nidge No. 1	130,613	Victoria, B.C., 1912	Barge	60 0	20 0	4 7	46	Victoria, B.C.	Vancouver Island Power Co., Victoria, B.C.
P. A. L	130,656	Caraquet, N.B., 1911	Schr.	38 0	14 0	6 0	17	Chatham, N.B.	P. A. Lanteigne, Caraquet, N.B.
P. D. C. 2	130,491	New Westminster, B.C., 1909.	Dredge	67 0	23 5	5 3	157	N. Westminster, B.C.	J. W. Pike, New Westminster, B.C.
P. D. C. 5	130,492	" " " 1911.	"	71 3	19 7	6 0	149	" " B.C.	" " " "
Province	130,838	Fort William, Ont., 1911	Scow	162 0	40 0	10 0	580	Port Arthur, Ont.	Canadian Towing & Wrecking Co., Port Arthur, Ont.
R. L. Borden	130,817	Liverpool, N.S., 1912	Schr.	115 4	26 1	10 3	99	Lunenburg, N.S.	A. Himmelman, M.O., Rose Bay, N.S.
Theresa Maud	130,505	Allendale, N.S., 1912	"	91 5	25 2	9 3	78	Shelburne, N.S.	W. Forsey, Grand Bank, Nfld.
Wabash No, 1	130,610	U. S. A.	Barge	50 0	15 0	3 5	20	Victoria, B.C.	F. A. MacFarlane and F. MacFarlane, Sidney, B.C.

for officers and crew, including showers for the firemen.

The vessel will be lighted throughout by electricity. The main propelling engines will consist of one set of triple expansion surface condensing engines having cylinders 16, 26 and 44 ins. diar., with a common stroke of 36 ins. The air, feed and bilge pumps will be worked from the main engine. Exceptionally large ballast pumps are being fitted, capable of dealing with the 850 tons of water ballast in about two hours.

The boilers, two in number, will be of the marine Scotch type, 11½ ft. diar. by 10½ ft. long, with a working pressure of 180 lbs. per sq. in. The boilers will be fitted with forced draft. Ash ejectors will be fitted in the stokehold for discharging ashes overboard.

The form of the vessel will be full in order to get the greatest carrying capacity on a canal draft. It is expected she will carry 2,200 gross tons, or 85,000 bush. of grain, through the canals. She will be engaged in the coal and grain trade between Lake Erie ports and Montreal, and is to be delivered in September.

Plans and specifications were prepared by John Reid and Co., Montreal, who will also superintend the construction at Collingwood, Ont.

Vessels Removed from the Register.

The following vessels were removed from the register during Jan., Feb. and March, for the reasons assigned:—Steam—Ahteek, Sault Ste. Marie, Ont., 21 tons, burnt; Albert, Hamilton, Ont., 1 ton, out of existence; Alice Brooks, Owen Sound, Ont., 11 tons, wrecked; Ampere, Hamilton, Ont., 3 tons, broken up; Anderson, Collingwood, Ont., 11 tons, broken up; Argo, Sault Ste. Marie, Ont., 4 tons, sunk; Beatrice, Collingwood, Ont., 21 tons, burnt; Beaver, Hamilton, Ont., 2 tons, out of existence; Chieftain III., Kingston, Ont., 147 tons, sunk in collision; Circe, Collingwood, Ont., 2 tons, out of existence; City of Mount Clemens, St. Catharines, Ont., 69 tons, sunk; Conveyor, Victoria, B.C., 380 tons, dismantled; Distributor, Victoria, B.C., 379 tons, dismantled; Dot, Quebec, Que., 7 tons, broken up; Eagle, Sarnia, Ont., 9 tons, out of existence; Edna, Hamilton, Ont., 8 tons, out of existence; Edna, Sault Ste. Marie, Ont., 7 tons, dismantled; Estella, Collingwood, Ont., 6 tons, abandoned; Fairy, Cobourg, Ont., 15 tons, out of existence; Forrester, Windsor, Ont., 2 tons, out of existence; George Douglas, St. Catharines, Ont., 15 tons, burnt; Gordon Gauthier, Windsor, Ont., 18 tons, burnt; Grace Darling, Collingwood, Ont., 19 tons, abandoned; Hazel W., Sault Ste. Marie, Ont., 3 tons, dismantled; Henrietta, Hamilton, Ont., 2 tons, out of existence; Huron Belle, Collingwood, Ont., 18 tons, abandoned; Inez, Hamilton, Ont., 2 tons, out of existence; Imperial, Sault Ste. Marie, Ont., 22 tons, dismantled; Interocean, Collingwood, Ont., 98 tons, lost; Iona, Sydney, N.S., 35 tons, sold to foreigners; James Adams, Port Arthur, Ont., 35 tons, broken up; James Leighton, Sarnia, Ont., 14 tons, out of existence; James Norris, St. Catharines, Ont., 34 tons, out of existence; John Hunter, St. Catharines, Ont., 22 tons, out of existence; John Jordan, Sault Ste. Marie, Ont., 3 tons, dismantled; John William, Collingwood, Ont., 10 tons, abandoned; Joe Knight, St. Catharines, Ont., 11 tons, out of existence; Kate, Quebec, Quec., 7 tons, out of existence; Kildare, Hamilton, Ont., 4 tons, out of existence; Lady Ida, Port Hope, Ont., 17 tons, out of existence; Lady of the Lake, Owen Sound, Ont., 25 tons, foundered; Lady of the Lake, Victoria, B.C., 13 tons, dismantled; Lewis Shikluna, St. Catharines, Ont., 11 tons, out of existence; Lion, Port Hawkesbury, N.S., 13 tons, broken up; Louisa, St. Catharines, Ont., 5 tons, out of existence; Maida, Collingwood, Ont., 2 tons, out of existence; Marie, Quebec, Que., 21 tons, out of existence; Mary Beck, Collingwood, Ont., 11 tons, burnt; May Flower, Collingwood, Ont., 17 tons, dismantled; Minto, New Westminster, B.C., 23 tons, abandoned; Mona, Hamilton, Ont., 2 tons, out of existence; Operator, Victoria, B.C., 380 tons, dismantled; Quiddy, St. John, N.B., 10 tons, broken up; Rescue, Collingwood, Ont., 17 tons, abandoned; Rover, Sault Ste. Marie, Ont., 3 tons, abandoned; Sea Gull, Sarnia, Ont., 35 tons, dismantled; Secret, Hamilton, Ont., 6 tons, burnt; Skylark, Brockville, Ont., 27 tons, broken up. Shamrock, Winnipeg, 55 tons, broken up; Spry, Kingston, Ont., 9 tons, broken up; Union, St. Catharines, Ont., 163 tons, sunk; Vandyke, New Westminster, B.C., 157 tons, dismantled; Wales, Sarnia, Ont., 238 tons, out of existence; Winslow, Sarnia, Ont., 193 tons, burnt; Yuba, Barrington, N.S., 6 tons, broken up. Sailing—A. F. Davidson, Annapolis Royal, N.S., 503 tons, transferred to West Indies; Abana, St. John, N.B., 97 tons, condemned; Albatross, St. Catharines, Ont., 317 tons, lost; Alfred, Weymouth, N.S., 29 tons, broken up; Alice M. Pike, Shelburne, N.S., 86 tons, transferred to Newfoundland; Annie Cuthbert, Cobourg, Ont., 36 tons, out of existence, Arginia, Lunenburg, N.S., 90 tons, transferred to Newfoundland; Ayr, St. Catharines, Ont., 299 tons, out of existence; Azov, Hamilton, Ont., 195 tons, sunk; Bonnie Kate, Canso, N.S., 14 tons, sold to foreigners; Brenton, Yarmouth, N.S., 69 tons, broken up; Defiance, St. Catharines, Ont., 89 tons, out of existence; E. R. C. Proctor, Cobourg, Ont., 163 tons, out of existence; Effie May, Lunenburg, N.S., 49 tons, stranded; Emulator, Lunenburg, N.S., 99 tons, stranded; Evolution, Parrsboro, N.S., 173 tons, sold to foreigners; Florence B. W., Halifax, N.S., 24 tons, transferred to Newfoundland; Janet R., Halifax, N.S., 37 tons, transferred to Newfoundland; Kate, Sault Ste. Marie, Ont., 30 tons, burnt; Kittie J., St. John, N.B., 1 ton, broken up; Laura C., Lunenburg, N.S., 249 tons, transferred to West Indies; Laura E. Franklin, Halifax, N.S., 46 tons, wrecked; Messenger, Collingwood, Ont., 94 tons, broken up; Minnie J. Smith Lunenburg N.S., 99 tons, transferred to Newfoundland; Mittie, Sarnia, Ont., 18 tons, wrecked; Nina L., Sydney, N.S., 96 tons, lost at sea; Oresa, Halifax, N.S., 14 tons, lost; Pearl, Halifax, N.S., 17 tons, broken up; Rhoda, Liverpool, N.S., 199 tons, lost at sea; Stanley and Frank, Shelburne, N.S., 74 tons, transferred to Newfoundland; Virginia, Lunenburg, N.S., 134 tons, stranded; W. S. M. Bentley, Parrsboro, N.S., 364 tons, transferred to West Indies.

Canadian Interlake Line, Limited.

Canadian Interlake Line, Ltd., has been incorporated under the Dominion Companies Act, with $2,000,000 capital, and office at Toronto, to operate steam and other vessels, and act as shipowners and shipping agents, and for other purposes. This company is a consolidation of the interests associated with the Merchants Mutual Line, Toronto. The directors are, J. W. Norcross, M. J. Haney, T. Bradshaw and J. F. M. Stewart, Toronto; R. M. Wolvin, Winnipeg; H. Munderloh, Montreal, and E. H. Ambrose, Hamilton, Ont.

The vessels which will be operated by this company, during the season, are, Acadian and Canadian, formerly owned by the Mutual Steamship Co., Toronto; Renvoyle, formerly owned by Point Anne Quarries, Ltd., Toronto, and A. E. McKinistry, formerly owned by Interlake Transit, Ltd., Toronto, all of which were, last year, operated by the Merchants Mutual Line. In addition to these, three vessels have been ordered, two of them being built by the Western Dry Dock and Shipbuilding Co., Port Arthur, Ont., and the third by the Clyde Shipbuilding and Engineering Co., Port Glasgow, Scotland. The two first mentioned, which will be named respectively, Calgarian and Hamiltonian, are being built on the Isherwood system, especially for package freight, and will be equipped with engines having cylinders, 18, 38 and 50 ins. diar., by 42 ins. stroke. The dimensions will be, length 250 ft., breadth 42½ ft., depth 26½ ft. They will be practically, duplicates of the steamboat Acadian. The third vessel, which will probably be named Indian, under construction at Port Glasgow, will be of the same dimensions, and will be used for the package freight trade, but she will be equipped with Diesel oil combustion engines with four cylinders 18 by 36 ins. It is anticipated that all the vessels will be ready for delivery by about June 1.

The vessels owned by Canadian Interlake Line, Ltd., will be operated as a part of the Merchants Mutual Line, as will also, the vessels A. E. Ames, Beaverton, H. M. Pellatt, J. H. Plummer, Mapleton and Saskatoon, owned by the Merchants Mutual Line, Ltd.; Scottish Hero, Turret Chief and Turret Court, owned by the Canadian Lake and Ocean Navigation Co., and D. A. Gordon, owned by the International Steamship Co.

It is announced that an issue of $520,000 first mortgage bonds is being placed on the market, and it is stated that this issue represents 50 per cent. of the value of the vessels owned. The bonds will be for 15 years with provision for retirement at 105, through an annual sinking fund, of the whole at maturity. The annual net earnings are estimated to realize about 3½ times the amount of the annual bond interest, and the insurance carried covers about 150 per cent. of the outstanding bonds.

Dry Dock for Quebec.

The Dominion Public Works Department will receive tenders to July 2 for the construction within four years of a dry dock in the port of Quebec under the Dry Dock Subsidies Act. The dock is to be not less than 1,150 ft., usable length, 110 ft. clear width at entrance, and at least 37 ft. in depth over sill and keel blocks at ordinary high water spring tide, and to be in three compartments.

The dock is to be located either at Lauzon, on the south side of the river, or in the estuary of the River St. Charles, or on the Beauport flats, and tenders are to submit with their proposal a report signed by their engineer, setting forth in detail the respective advantages from the viewpoint of the shipping interests of each of the above mentioned sites; also plans and specifications with full and detailed estimates of cost.

The Government will not build the dock, but will pay a subsidy in aid of the construction, of 3½% per annum for 35 years on an expenditure of about $5,000,000.

The Dominion Public Works Department received tenders to Apr. 22, for the construction of a single screw steam tug, 80 ft. long.

During Feb., one employe connected with Canadian navigation was killed, and three were injured, the fatality being due to drowning.

A considerable amount of improvement work will be undertaken in Owen Sound harbor during the present season. The cement wharf is to be extended north to the G.T.R. property, the dock on the west side is to be repaired, as is also the North Keppel wharf. The Dominion Government has included $65,000 for the work in the estimates.

Proposed Sale of Niagara Navigation Co. to the R. & O. N. Co.

The Richelieu and Ontario Navigation Co. has offered to buy a controlling interest in the Niagara Navigation Co., Ltd., at $200 per $100 share, payable in cash or in R. and O.N. Co.'s shares at $120, at shareholder's option, i.e., five shares of R. and O.N. stock will be given for three of N.N. Co. The offer is good until May 4, subject to an extension not later than June 1, in the case of shareholders who, owing to absence, etc., have not an opportunity of deciding within the first mentioned time limit. The R. and O.N. Co. has deposited $100,000 with the Montreal Trust Co., to be forfeited to the owners of deposited stock if the company fails to carry out its offer. The N.N. Co. directors have issued a circular to shareholders saying they have decided to accept the offer for their own shares, subject to the acceptance of it by holders of 51% of the stock.

The N.N. Co.'s capital stock at the close of the last financial year was $1,000,000, of which $701,700 had been subscribed and paid. To pay in part for the purchase of the Hamilton Steamboat Co. and the Turbine Steamship Co. in Dec., 1911, 1981 shares of the N.N. Co. were issued and 1,002 shares were offered to shareholders at par, bringing the capital issue up to $1,000,000, all of which has been paid up except a very few shares. Power was given at the last annual meeting to increase the capitalization to $3,000,000, but none of the $2,000,000 has been issued. The company has paid 8% per annum in half yearly dividends for a number of years.

The N.N. Co. owns eight steamboats. The Cayuga, Chippewa, Corona, Chicora and Ongiara comprised its own fleet up to the end of last year, the three former for the Toronto, Niagara, Queenston and Lewiston run. The Chicora, it is announced, will run between Toronto and Olcott, N.Y., this year, and the Ongiara in ferry service on the Niagara River. The Macassa and Modjeska, bought from the Hamilton Steamboat Co., and the Turbinia from the Turbine Steamship Co., are to run between Toronto and Hamilton.

The N.N. Co.'s directors are:—Sir Edmund B. Osler, President; Barlow Cumberland, Vice President; Hon. J. J. Foy, J. Bruce Macdonald, F. G. Osler and Hon. J. S. Hendrie. The officials are:—B. W. Folger, General Manager; J. M. Sullivan, Secretary; R. H. McBride, Treasurer; J. V. Foy, General Passenger Agent; J. A. Goodearle, General Freight Agent. S. J. Murphy, Travelling Passenger Agent; H. E. Weller, City Ticket Agent, Toronto; W. E. Bishop, General Agent, Hamilton.

A circular addressed to N.N. Co. shareholders, April 22, by the President, Sir Edmund B. Osler, states that in addition to getting 200 for their stock they will receive a bonus of about $12 for each share held, which will be realized on the 1,981 shares issued in Dec., 1911, as part payment for the Hamilton Steamboat Co. and the Turbine Steamship Co. The owner of these companies, J. C. Eaton, Toronto, decided not to hold the stock, but to sell it at cost, and in order to protect the price of the stock the directors arranged for Mr. Eaton's stock to be taken over through a third party, the benefit of which transaction the shareholders are to receive.

The Livingstone channel, in the Detroit River, which is considered to be the next important channel to the Sault Ste. Marie locks, in the development of lake commerce, will be opened for traffic about July 1. The construction has occupied about five years and cost the U. S. Government about $10,000,000.

Oil for Fuel on R. and O. N. Co's. Steamships.

The Richelieu and Ontario Navigation Co. is equipping with fuel oil burning apparatus two of its steamboats, Rapids Queen and Rapids Prince, which run on the St. Lawrence River between Montreal and Prescott, Ont.

The Rapids Queen is being equipped with an English system of burners at Levis, Que., and the Rapids Prince with a United States system at Sorel, Que., the work of installation being done by the company's workmen. The two systems will be tested against each other during the ensuing season and on the results will depend the adoption of oil instead of coal on some of the company's other boats, particularly the Toronto and the Kingston, which run between Prescott and Toronto, and will probably be equipped next year.

The Rapids Queen and Rapids Prince are being fitted with round steel storage tanks in the coal bunker space, capacity of from 25 to 30 tons oil being provided on each vessel.

Merchant Service Guild of British Columbia.

This guild has been formed with headquarters in Victoria to combine the whole of the navigators (commanders, pilots and officers) engaged in the B.C. merchant service, with the object that they shall through the guild be represented in any matters whatsoever connected with their profession, and also to advance and defend the interests and independence of its members, to obtain a voice in the making of the laws under which they are governed, and to promote cordial relations with their employers, the various shipping companies and owners. One of the most important aims of the guild will be to provide those of its members who abide by its constitution and rules, with legal defence in cases involving the cancellation or suspension of certificates.

The fees, etc., are as follows:—Captains and port pilots, entrance fee $10, annual subscription $15. officers, all grades, entrance fee $5, annual subscription $10.

Marine Insurance on the St. Lawrence Route

While in Montreal, Apr. 4, the Minister of Marine is reported to have said: "Something must shortly be done if the insurance people persist in discriminating against the route. It may be that a Canadian Lloyd's may have to be established in order to remove what is practically an embargo on the St. Lawrence. The people of this country have spent millions of dollars improving the channel. In spite of all this, and the assurance that the work of improving the water highway to the sea wil be continued, the insurance rates have remained stationary. Such discrimination cannot be tolerated forever. How this can be brought about is under our consideration."

The Lake Carriers' Association is being asked to request the U.S. Government to abolish arbitrary closing of the navigation on the Great Lakes, on Dec. 1, each year. It is to be urged that grain, lumber and coal vessels can safely operate up to Jan. 1, if the aids to navigation are allowed to remain.

The canal lock at Black Rock harbor, Buffalo, N.Y., which makes the connection between Lake Erie and the new Erie barge canal, has been completed. It is stated to be the largest inland water lock in the world. The gates are of steel, and will be operated by electricity. The cost was $1,250,000.

Coast Lake and River Officers for 1912.

The following appointments made by navigation companies engaged in Canadian navigation for their various steam vessels and tugs for the current year, have been officially reported to The Railway and Marine World, by the managements, in addition to those given in our last issue. In the first column is given the name of the vessel, in the second that of the captain, and in the third that of the chief engineer.

ALL RED LINE, LTD., VANCOUVER, B.C.

Selma	S. Mortimer	J. Stephens

G. A. BINET, FRASERVILLE, QUE.

Canada	A. Belanger,	P. Bolduc.

CANADIAN INTERLAKE LINE LTD., TORONTO.

A. E. McKinistry,	A. C. Leitch.	A. E. Stinson.
Acadian,	R. McIntyre,	J. Duguid.
Calgarian	.....	.....
Canadian,	W. Anderson,	R. McLaren.
Hamiltonian,	A. B. McIntyre,	.....
Indian,	H. Larush,	.....
Renvoyle,	H. Redfearn,	A. McLaren.

CANADIAN LAKE AND OCEAN NAVIGATION CO., LTD., TORONTO.

Scottish Hero,	F. Davis,	J. W. Taylor.
Turret Chief,	H. Aitken,	A. E. House.
Turret Court,	N. Barrett,	S. Jones.

CORNWALL AND MONTREAL TRANSPORTATION CO., MONTREAL.

Hebron,	H. Caza,	Alf. Cote.
City of Toronto,	P. Hains,	Alp. Cote.

F. BURNET, BIRDSALL, ONT.

Rainbow	F. Burnet	T. C. Whitred

INTERNATIONAL STEAMSHIP CO., LTD., TORONTO.

D. A. Gordon,	R. F. Pyette,	G. Adams.

LEMCKE TUG CO., LTD., LIONS HEAD, ONT.

Chas. Lemcke,	A. Webster.	E. B. Rumley.

MAY QUEEN STEAMSHIP CO., LTD., GAGETOWN, N.B.

May Queen,	R. H. Weston,	W. Pitt.

MERCHANTS MUTUAL LINE, LTD., TORONTO.

A. E. Ames,	F. Dalby,	L. McMillan.
Beaverton,	W. Zealand,	H. Myler.
H. M. Pellatt,	E. McConkey.	W. Harmon,
J. H. Plummer,	P. McIntyre,	R. Chalmers.
Mapleton,	R. D. Simpson,	H. MacDonald.
Saskatoon,	P. McCarthy,	A. E. Kennedy.

MIRAMICHI STEAM NAVIGATION CO., LTD., CHATHAM, N.B.

Alexandra,	J. Nowlan,	W. Stewart,
Miramichi,	J. P. Bullick,	C. Johnston.
Sybella, H.,	E. Steel,	A. C. McIntyre.

NORTHLAND TRANSPORTATION CO., LTD., ATHABASCA LANDING, ALTA.

Northland Call,	R. B. Barber.	M. Smith,
Northland Lake,	Under construction.	
Northland Light,	L. R. Morton,	F. J. Davis.
Northland Star,	J. Matheson,	T. Prentiss.
Northland Sun,	.....	J. A. Patterson.

WESTERN NAVIGATION CO., LTD., FORT WILLIAM, ONT.

Kaministiquia,	E. L. Stephen,	H. Young.

Oil Engines Are to Be Used for a fleet of 14 vessels now being built for the Glasgow (Scotland) Motor Coasting Co. Eight of these, of 140 tons each, will have 90-h.p. engines and are intended for traffic on the Forth and Clyde canal. Two others are to be of 230 tons, with 120-h.p. engines, two more of 280 tons with 130-h.p. engines, and two of 360 tons with 160-h.p. engines. The fuel tanks of all will hold oil sufficient for three weeks running. The 140-ton vessels can carry 35 to 40 tons more cargo than similar vessels propelled by steam.

Dominion Marine Association.

PRESIDENT, Jas. Playfair, Midland, Ont.; COUNSEL, F. King, Kingston, Ont.

Great Lakes and St. Lawrence River Rate Committee.

CHAIRMAN, W. F. Wasley, Gravenhurst, Ont.
SECRETARY, Jas. Morrison, Montreal.

International Water Lines Passenger Association.

PRESIDENT, A. A. Heard, Albany, N.Y.
SECRETARY, M. R. Nelson, New York.

The Shipping Federation of Canada.

PRESIDENT, A. A. Allan, Montreal: MANAGER AND SECRETARY, T. Robb, 526 Board of Trade, Montreal.

Ship Masters' Association of Canada.

GRAND MASTER, Capt. J. H. McMaugh, Toronto Ont.; GRAND SECRETARY-TREASURER, Capt. H. O. Jackson, 376 Huron St., Toronto.

Atlantic and Pacific Ocean Marine.

The report that the Allan Line had purchased the White Star Line s.s. Cretic is incorrect, she having been sold to Italians.

A Vancouver press dispatch states that the Royal Mail Steam Packet Co. will establish a service between Europe and British Columbia, with Victoria as the Canadian port, via the Panama canal.

The first transatlantic steamship scheduled to come up the St. Lawrence this season was the C.P.R. Empress of Britain, due to arrive at Quebec, Apr. 26.

The Warren Line, which has been operating a line of steamships between Liverpool, Eng., and Boston, Mass., has been acquired by Lord Furness, of Furness, Withy and Co., and other shipping interests with Canadian connections.

Manchester Liners, Ltd, operating a direct line between Canada and Manchester by the Manchester ship canal, is reported to have ordered a new vessel for the service, in England. This company is controlled by the Furness interests.

Holt and Co., Liverpool, England, operating the Blue Funnel line, on a round-the-world service, calling at Vancouver, are reported to have placed orders for the construction of five steamships for the Panama canal service. They will be about 8,000 tons register, with a speed of 16 knots an hour.

The two vessels which the Cunard Co. recently ordered in Great Britain for its Canadian service, operated as the Cunard-Thomson Line, with Robert Reford Co., as agents, will be named Andania and Alaunia. They will each be about 520 ft. long and of 15,000 tons register, with accommodation for 425 cabin passengers and 1,600 third-class passengers.

It is reported from Japan that the C.P.R. s.s. Empress of China, which was wrecked off Shirahama, Japan, July 26, 1911, and which was floated, early this year, has been declared by the underwriters to be a total constructive loss, and that she will be offered for sale by public auction.

The Canada-Calais Line is reported to have been organized in Chatham, N.B., to carry on a steamship service, chiefly in the pulp wood, hay, and store cattle trade between Chatham and Calais, France. It is stated that a vessel has been secured for the service, which will be commenced shortly, and the trip made every six weeks.

The Government has renewed the mail contract to the Allan Line for 12 months from May 1, for $600,000 as before, the same arrangement between the Allan Line and the C.P.R. being also continued as heretofore. It is said that this renewal is of a temporary character, as the whole of the mail service is to be put on a new basis entirely.

La Compagnie Generale Transatlantique is reported to have decided to establish a regular steamship service between Canada and France. with Halifax and Quebec as the Canadian ports and Dunkirk and Havre as the French ports. The first sailing was announced to take place from Havre, April 27. S. Cunard and Co., Halifax, N.S., are the company's agents.

We are officially advised that there is no truth in the press reports from the Pacific coast, to the effect that the Canadian Northern Ry. is chiefly interested in the recently inaugurated steamship service between Canada and Australia. While it seems a natural thing, that the company might inaugurate such a service, it is, as yet, some time in the future.

The reports circulated towards the end of last year that the C.P.R. was about to discontinue its service between the St. Lawrence and Avonmouth, and that the steamships Montcalm and Monmouth, engaged in that service, were to be sold, was incorrect, as the Monmouth sailed from Avonmouth, Apr. 15, and it was announced that the Montcalm would follow, May 1.

A Montreal press dispatch states that so far as can be ascertained, proposals are being made by the C.P.R. for the establishment of a steamship service between the Maritime Provinces and the West Indies, and that it will transfer its Empress steamships from the Pacific for this purpose, in addition to building large summer hotels at St. John, N.B., Yarmouth, N.S., and in Bermuda and Jamaica.

The European and Brazilian Shipping Co., Ltd., has been incorporated under the Dominion Companies Act, with $250,000 capital, and office at Toronto, to operate lines of steamers and other vessels, and carry on a general shipowning and shipping business, throughout the Dominion and elsewhere. The incorporators are:—J. S. Lovell, C. D. Magee, S. G. Crowell, J. F. Lash and others, of Toronto.

In connection with the agreement between the Dominion and the West Indies, announcement of which was made Apr. 9, the Minister of Trade and Commerce stated that the question of improved cable and steamship connection had been carefully considered, and as the agreement had yet to be submitted to the British and West India Governments for consideration, the details could not be made public.

The Quebec board of trade has asked the Minister of Trade and Commerce that all vessels owned or controlled by companies in receipt of Dominion subsidies for the carrying of European mails, be bound. as a condition of the subsidy grant, to carry freight and passengers to and from Quebec at a cheaper rate than to and from Montreal, in proportion to the mileage saved, and also that all freight shippers shall be treated equally as to rates and rebates.

The Ulster Steamship Co., which operates the Head Line of steamships to Canada, in its annual report for the half year ended Jan. 31, showed net earnings of £17,929 9s 10d. The net balance to credit of profit and loss, after paying interest on deposits, income tax, etc., is £16,269 16s 6d, from which £10,000 has been written off for depreciation. A dividend of 5 per cent. for the half year is being paid, leaving £1,394 16s 6d to be carried forward. It was announced that the Dominion Government had renewed the subsidy for the service between Canada and Ireland.

The Allan Line steamships Alsatian and Albynian, which are under construction in Great Britain, will, it is expected, be delivered by March, 1913. G. Hannah, Passenger Traffic Manager, Montreal, is reported to have stated recently, in connection with the report, that the company is to remove its Canadian terminus to Quebec, that it is a question whether the two new vessels will be able to come up to Montreal, as they will be of a type that has not yet been up the St. Lawrence, each having four convertible shafts, no other vessel with more than three having come to Montreal as yet.

A Montreal press report states that the C.P.R. has placed orders for building three steamships, larger and faster than the present vessels operating across the Atlantic, for the Canadian-British service. The report continues, "In Kingston, Jamaica, Mar. 6, A. H. Harris, who is an assistant in Vice-President Bosworth's office, and, therefore, in a position to know the company's plans, made the following announcement to the members of the Merchants Exchange, 'The C.P.R. has a record of having the finest ships between Canada and Liverpool, and they are now building 30,000-ton boats to travel between Liverpool and Halifax.'" We are officially advised that there is no truth in the report.

The two twin screw steamships which the Cunard Steamship Co. have ordered from Scotts' Shipbuilding and Engineering Co., Greenock, Scotland, for the Canadian trade, will each be about 540 ft. long, 63¼ ft. in breadth, 46 ft. deep to shelter deck, and of about 13,000 gross. Accommodation of a superior character will be provided in each for over 500 second class and over 1,500 third class passengers, the latter being all in two and four berth rooms. The equipment will include all the most modern improvements. The machinery will consist of two sets of quadruple expansion engines, balanced, and having cylinders 26 in., 37 in., 53 in., and 76in., in diar, respectively, and a stroke of 54 in. Steam will be supplied by five doublehave a high service speed.

The Central Vermont Transportation ended boilers, and the vessels will Co. has ordered two steamships for its service between Providence, R.I., and New York. They are chiefly designed for passengers, but some express freight will also be carried. They will be of steel, built to Lloyds' requirements for the highest class, with double bottoms, subdivided by steel watertight bulkheads. The machinery will consist of two sets of triple expansion engines, balanced on the Yarrow, Schlick and Tweedy system, boilers of the return fire tube type with forced draught, supplying steam at 180 lbs. pressure. They will be 332 ft. long and 66 ft. wide at the widest part of the deck, and of twin screw type, designed for a speed of 20 miles an hour. The passenger accommodation is to be of the most up-to-date description, for about 500 first class and 200 second class passengers.

Maritime Provinces and Newfoundland.

A. McDougall, Maitland, N.S., has been appointed inspector of hulls for Nova Scotia, vice Capt. Seeley, deceased.

The Victoria Steamship Co., Ltd., North Sydney, N.S., has increased its capital stock from $12,000 to $40,000.

N. P. Freeman has been appointed superintendent of the survey and measurement of ships, and surveyor of accommodation for seamen, at Liverpool, N.S.

H. D. Troop, of the old firm of Troop and Son, reputed, in its day, to be the largest owners of sailing ships in the world, died at St. John, N.B., Apr. 1, aged 73.

The Red Cross Line is reported to have chartered the s.s. Erna, of St. John's, Nfld., for its Montreal service, this year, on account of the loss of the Bonavista.

The Imperial Dry Dock Co. is applying to the New Brunswick Legislature for an extension of time for the commencement and completion of the projected dry dock at St. John.

The Minister of Marine stated in the House of Commons, recently, that tenders would shortly be asked for the construction of a lightship to be stationed off Halifax harbor.

A. Boston, Mass., dispatch of April 17 says the Dominion Atlantic Ry. steamships, running between Yarmouth, N.S., and Boston, and which came under C.P.R. control with the D.A.R., have been sold to the Eastern Steamship Co., which has its headquarters in Boston.

The New Brunswick Legislature has before it, Apr. 9, the St. John Canal and Dock Co.'s bill, providing for the construction of a canal from the head of St. John harbor to Marble Cove. The expenditure is estimated at between $2,000,000 and $3,000,000, apart from

any expenditure on wharves and other facilities. Consideration was deferred.

The British s.s. Kamarasca, under charter to the Dominion Coal Co., arrived at Louisburg, N.S., early in April. She was built at Newcastle, Eng., in 1911, and was for a few months in the East India trade. She has been specially built for the coal trade, with deck hatches arranged for quick loading and unloading. Her dimensions are, length, 398 ft., breadth 52 ft., depth 41 ft., with 8,000 dead weight capacity, and a speed of 13 knots an hour.

The North Sydney, N.S., board of trade is complaining that while vessels of no matter what tonnage, only pay $5 tonnage dues on entering Sydney, they are obliged to pay at the rate of 1c a ton on entering North Sydney, some vessels paying as much as $130 a trip. A resolution was passed that steps be taken to have the port placed on an equal footing with Sydney and asking that the statute of 1879 respecting the appointment of harbor commissioners for North Sydney be repealed.

Island Fisheries, Ltd., has been incorporated under the Dominion Companies Act, with $20,000 capital, and office at St. John, N.B., to carry on a general fishing business, and in connection therewith, to own and operate steam and other vessels. The incorporators are:—P. P. Russell, G. D. Grimmer, St. Andrews; A. Wooster, S. D. Guptill, Grand Manan, N.B.; W. McLure, Pictou; W. H. Starratt, Halifax, N.S.; H. H. Acorn, Souris, P.E.I.; C. F. Mattlage, New York, and A. E. Richards, Hamilton, Ont.

The preliminary enquiry into the loss of the British s.s. Isleworth, which ran on the rocks off Chebucto Head, Halifax, recently, has been held by Capt. W. R. Lugar, who found that the loss was due to the crippled condition of the vessel, several blades having been stripped off her propellors, due to contact with ice, thus making her unmanageable. The report will be forwarded to England, where a further enquiry will be made, as the vessel is on the British register. She was under charter to the Dominion Coal Co.

Prof. A. R. Kirkpatrick of Queen's University, Kingston, Ont., was visiting various points in Nova Scotia and Prince Edward Island, early in April, for the purpose of investigating their possibilities as terminals for the proposed car ferry service between the mainland and the island. Richibucto, Brule and Pictou on the main land, and Summerside, West Cape, Charlottetown, Carleton, Tormentine, and other points on the island were visited, and he is reported to have stated that with car ferries of the proper design and strength, it would be possible to carry on a service throughout the winter, the conditions being no worse than have already been overcome in Canada and elsewhere.

Province of Quebec Marine.

H. Labelle, chief grain inspector for the port of Montreal, died there, recently, aged 78.

The sheds which the Montreal Harbor Commissioners are erecting on the Victoria wharf, are expected to be completed and ready for occupation by July.

C. C. Ballantyne, one of the members of the Montreal Harbor Commission, has announced that he will retire from the board in September, to devote his time to his private affairs.

The Postmaster General advised the Quebec board of trade, Apr. 9, that the Minister of Railways and Canals, the Chairman of the National Transcontinental Ry. Commission, the Chairman of the Quebec Harbor Commission, and himself would inspect the port towards the end of the month, with a view to arranging for the early carrying out of the proposed harbor improvements and railway terminals.

The Quebec board of trade council, decided, Apr. 5, to memoralize the Dominion Government regarding winter navigation of the lower St. Lawrence, laying special stress on the records made during the past winter by the steamships Montcalm and Mahone, and the possibilities, should such service be undertaken by larger and stronger vessels. The council will also take up with the Government the question of deepening the channel below Quebec.

Ontario and the Great Lakes.

John White, a former harbor master at Midland, died there, Apr. 10, aged 67.

The Fort William Coal Dock Co., Ltd., has increased its capital stock from $200,000 to $500,000.

A report from Deseronto states that the Government will dredge the harbor to a uniform depth of 15 ft.

The Hamilton city council has appointed H. S. Wallace as its representative on the Hamilton Harbor Commission.

The Keystone Transportation Co., Montreal, has ordered the construction of an additional steamboat in Collingwood.

Interests allied with the Canadian Northern Ry., are reported to be negotiating for the purchase of the Rideau Lakes Navigation Co.

The Department of Railways and Canals received, Apr. 26, tenders for improving the lower extreme to lock 15 of the Cornwall canal.

It is reported that the Department of Railways and Canals will shortly enter into a contract with the Ontario Government for the lighting of the canals system by electricity.

The Niagara, St. Catharines and Toronto Navigation Co.'s steamboat Dalhousie City, entered Toronto harbor, from Port Dalhousie, Apr. 10, being the first vessel of the season.

Peter Paton, heretofore Travelling Western Representative, Northern Navigation Co., Winnipeg, Man., has been appointed Assistant to the President, with office at Sarnia, Ont.

The Toronto and Niagara Navigation Co., Ltd., has been incorporated under the Dominion Companies Act with an authorized capital of $2,000,000, to do a general steamboat business.

New rules for the regulation of pleasure craft in Toronto harbor, provide for the carrying of various lights on small vessels, according to class, any infringement making the offender liable to fine or imprisonment.

Press reports state that some of the C.P.R. vessels operating on the Great Lakes will be equipped with wireless telegraph apparatus before going into service this season. It is stated that the Marconi system is to be adopted, and that the shore station will be near Midland.

Consequent on the removal of the headquarters of the C.P.R. Upper Lakes Service, from Owen Sound to Port McNicoll, it is announced that the s.s. Manitoba will call at Owen Sound, en route to Sault Ste. Marie, on Wednesday in each week, and that no call will be made on the return trip.

Up to April 15 no official announcement had been made by the Minister of Railways and Canals as to what action it had been decided to take on the Dominion Marine Association's request for the earlier opening of the St. Lawrence canals and their continuous operation during the navigation season.

The Toronto Board of Trade's marine section has elected the following officers:—Chairman, F. Barlow Cumberland; Deputy-Chairman, J. T. Mathews; Secretary-Treasurer, F. G. Morley; Executive Committee, Capt. S. Crangle, E. Rogers. R. E. Gibson, A. A. Wright, F. Plummer and G. Sommerville.

The Toronto Harbor Commission has estimated the total revenue for the current year at $55,377, and the expenditure at $54,750. The expenditures include repairs to Centre island, Brock St., and other wharves, as well as development, surveys and organization, dredging, etc. A contract for dredging has been let to J. E. Russell.

Sir Robert Perks, of the Ottawa and Georgian Bay Ship Canal Co., was in Montreal, Apr. 10, in connection with the company's business, and is reported to have stated that work could be started and carried on very expeditiously, once the contract for the construction of the canal was awarded. He expected that the whole work could be completed within five years of its commencement.

The Citizens Coal and Forwarding Co., Ltd., has been incorporated under the Ontario Companies Act, with a capital of $40,000, and office at Gananoque, to carry on a wholesale and retail coal and lumber business, and to act as wharfingers and forwarders. W. J. Gibson, A. N. Robinson, W. T. Sampson, C. J. Wilson, D. Bain, M. McParland and F. B. Cowan, Gananoque, Ont., are provisional directors.

The Canadian steamboat Wasaga, which sank, after burning, off Copper Harbor, in Lake Superior, in 1909, and which has since constituted a menace to navigation, is to be dynamited, the U.S. War Department having awarded a contract for the work, for $3,500. The vessel was a wooden freighter, formerly known as Wissahickon, built in the U. S., and owned by the Collingwood Shipping Co., Collingwood, Ont.

In connection with recent reports to the effect that the Farrar Transportation Co. was about to be absorbed by the Playfair interests, T. I. Thompson, President, is reported to have stated that although the interests named had been seeking to obtain a controlling interest of the company's stock, there would be no merger. The prospects for the year were good, and it had been decided to build another vessel, probably in 1913.

The Northern Navigation Co., has placed the contract for the construction of its new vessel, with the Western Drydock and Shipbuilding Co., Port Arthur. The contract price is quoted as $750,000, and she is to be ready for launching, June, 1913. She is to be built on similar lines to the company's s.s. Hamonic, with steel hull, equipped with four cylinder, triple expansion engines, supplied with steam by four Scotch boilers. Her dimensions will be, length 385 ft., beam 52 ft., depth 28¾ ft.

The work of restoring the highways in the neighborhood of Holland Landing, which were cut for the construction of the Newmarket canal, has been completed, and it is stated that the locks and other works are to be put in as good condition as possible, so that should work be resumed at any future time, the expenditure already made will not be entirely wasted. The completion of the canal was suspended recently by the Government on account of the alleged impracticability of the scheme through lack of water.

The Northern Navigation Co., which is now a subsidiary of the Rochielieu and Ontario Navigation Co., has ordered from the Western Dry Dock and Shipbuilding Co. another steamship for the Sarnia-Port Arthur-Fort William route. The new vessel is to be 385 ft. long, 52 ft. beam and 29 ft. depth of hold. The general layout will be similar to the

Hamonic, except that she will have one more deck for passenger accommodation which will give her about 290 staterooms, which is about 125 more than the Hamonic has.

A North Bay, Ont., deputation waited on the Dominion Government recently to urge the immediate commencement of canalizing the French River, a part of the proposed Georgian Bay canal scheme. The portion of the work which is being urged covers about 60 miles of the river, and in the total length of 82 mies there is a rise of 72 ft., necessitating the construction of three locks, and the estimated cost of that portion is $14,000,000. The canal would leave Lake Nipissing almost opposite North Bay and enter Georgian Bay a few miles north of Key Harbor.

The lake freighter Toiler, equipped with internal combustion engines, descriptions of which have been given in The Railway and Marine World, is reported to have been sold to Jas. Playfair, President, Inland Lines, Ltd., and Northern Navigation Co. The Toiler was built at Wallsend-on-Tyne, Eng., and brought to Canada last year, and was operated as a grain carrier towards the end of last season. She is the first vessel of the kind to have crossed the Atlantic under her own power, and althougn of slow speed, is stated to have been a distinct success as an experiment.

The Northern Michigan Transportation Co., Chicago, Ill., will operate its steamboat Missouri, between Chicago and Collingwood, Ont., this season, the first sailing from Collingwood taking place on July 3, and further sailings on Wednesday in each week, leaving Chicago on Saturday in each week. The route to be followed is along the eastern shore of Lake Michigan, Mackinac Island, Sault River, and through the north channel of the Georgian Bay, calling at Little Current, Killarney and Parry Sound. The steamboat Missouri was built in 1904, her dimensions being length 225 ft., breadth 40 ft., depth 16 ft., tonnage, 2,434 gross, 1,484 register.

It was announced at a meeting of the Toronto Harbor Commissioners, Apr. 2, that the Dominion Government will undertake a number of improvement works in the harbor, this season, at an approximate expenditure of $238,517. They include protection for the reclaimed lands, about 46 acres, at the new western channel, construction of the island breakwater from west of the eastern channel along the shore to west of Centre island, the dredging of the eastern channel to 25 ft., and the renewal of the superstructure of the western channel pier. It was also stated that the new western channel would be completed this season, including a new lighthouse.

The Rainy River Navigation Co. has announced that it will not operate its vessels between Kenora and Rainy River points, this season. G. A. Graham, Manager, is reported to have stated that the company had made every effort to develop trade in the face of many difficulties, such as low water, the lack of a lock at the Long Sault rapids, etc., and it was hoped to continue the service, if the Government subsidy for carrying mails between Kenora and other points on the route, had been re-voted for this year, but as this had not been done, the service would be discontinued. The local board of trade will probably see if some arrangement cannot be arrived at for a continuance of the service.

The Mathews Steamship Co., Toronto, recently ordered another vessel to be built at Sunderland, Eng., for the lake and canal trade. J. T. Mathews, who recently returned from England, stated that delay had occurred in delivery, owing to the coal strike there, but he expected that she would arrive on this side about the end of June, or early in July. She has been named Easton, and is equipped with engines having cylinders, 17, 28 and 46 ins. diar., by 33 ins. stroke, supplied with steam by two Scotch boilers, 12 by 11 ft. The construction will be with double bottom, and she is fitted with steam steering wear, steam winches, electric light, etc. Her dimensions are, length 257 ft., breadth 42½ ft., depth 18 ft.

The Thousand Island Steamboat Co. received over 6,000 suggestoins for naming its new steamboat now being built at Toledo, Ohio. The one selected, is Thousand Islander, which was proposed by many contestants. Miss E. Walsh, of Kingston, Ont.. was the first to send in this name, and receives the $25 prize. As the vessel will be on the U. S. register, and will run in international waters, the management nas awarded an additional prize of $30, divided equally between the second and third proposers of Thousand Islander, viz., G. H. Dreybus, Traffic Agent, International Ry. Co., Buffalo, N.Y., and R. L. Jackson, chief clerk to General Agent, New York Central Lines, Watertown, N.Y. The Thousand Islander is nearing completion and will appear on the river early in June.

It is reported from Hamilton that the Mackay-Hall Steamship Co. is being organized for the operation of steamboats on the Niagara route and the Great Lakes. It is stated that the steamboats Massachusetts and Robert R. Rhodes have been purchased from the Gilchrist Transportation Co., Cleveland, Ohio, and that four other steamboats, at present operating between Montreal and the Great Lakes, will also be taken over by the new company. A. D. Mackay, Hamilton, and F. E. Hall, Montreal, are stated to be the promoters of the company. The steamboat Massachusetts was built in 1882; dimensions, length 235 ft., breadth 36 ft., depth 25 ft.; tonnage, 1,415 gross, 1,041 register. The Robert R. Rhodes was built in 1887; dimensions, length 246 ft., breadth 40 ft., depth 21 ft.; tonnage, 1,576 gross, 1,286 register; both are wooden vessels.

The Dominion Government has issued orders for the compilation of detailed plans and specifications for the proposed Welland canal route, and, it is stated, tenders will be called for in June, allowing about two months for the preparation and submission of same. The estimated cost of the work on the Ten Mile creek route is $45,000,000. The recent estimates included $200,000 for preparatory work. It is reported that the preliminary plans show seven locks with lifts of 46½ ft. each, 800 ft. long and 80 ft. wide, that the width of the canal at the bottom will be about 150 ft., that lock 1 will be at McCalla's Grove, which will be the site of the harbor, that the canal will cross the Queenston road, near Homer and will cross the present canal at lock 11. where the new lock 3 will be built, that the new canal will again cross the present canal near Marlatt's Pond, and that the depth of water in the locks will be 30 ft., and in the canal, 25 ft.

The Canadian opposition to the proposal of the Chicago drainage district to take an increased flow of water from the Great Lakes, through its canal, were heard by the U. S. authorities at Washington, recently. It was declared that the depth of water in the Montreal harbor would be affected 10¼ ins., if the proposal were carried into effect, and that last year, under the then existing conditions, two ocean-going vessels sacrificed 8,340 tons of cargo capacity, through low water. Arguments were also presented showing the effect on water levels in Kingston and Toronto harbors, and the lake levels generally. The following made representations:—F. King, counsel, Dominion Marine Association, who also filed a protest from the Kingston board of trade; A. A. Allan, Allan Steamship Line; F. E. Meredith, Shipping Federation of Canada; D. Seath, Montreal Harbor Commission; R. W. Reford, Montreal board of trade; F. S. Spence, Toronto Harbor Commission, and G. T. Blackstock, K.C., representing various Niagara River interests.

Manitoba, Saskatchewan and Alberta.

A paper on the navigability of the Red River was read before the Grand Forks, N.D., Commercial Club, recently, by E. F. Chandler of North Dakota University. He contended that tests had proved that for a considerable portion of the year the river was navigable, while trade would be suspended for the remainder. To overcome the difficulties caused by floods and low water, he mentioned the construction of controlling works at the outlet of Red Lake, which would partially, at any rate, equalize the flow of the river and prevent low stages to some extent, thus diminishing the suspension of traffic. Another plan proposed was the installation of a series of locks and dams, so arranged as to raise the water levels about three feet throughout the length of the river, at extreme low stages. The fall of the river between Grand Forks and Winnipeg is 75 ft., so that few dams would be required for the purpose. The lower section, near Winnipeg, has already been improved by the construction of the St. Andrews lock and dam. It is stated that the construction of three 8 ft. or 10 ft. dams would be sufficient to extend slack-water navigation as far as Grand Forks.

British Columbia and Pacific Coast Marine.

I. E. Lowe, Ladysmith, has been appointed a commissioner for the pilotage district of Nanaimo, vice W. C. Fraser.

Capt. W. S. French, R.N.R., who was well known as a navigator of the Yukon River some years ago, died at Vancouver recently, of pneumonia.

The C.P.R. s.s. Princess Patricia, which has been equipped with oil-burning apparatus, will be placed on the Vancouver-Nanaimo route early in May.

The Union Steamship Co.'s s.s. Chelohsin, which recently arrived at the coast from Ireland, struck a rock in the Skeena River, Apr. 1, and had to be beached.

The G.T.P. Coast Steamship Co.'s s.s. Prince Albert, in leaving Victoria harbor recently, struck a rock off Shoal Point, and was taken to Esquimalt for repairs.

The Coutli Tug and Barge Co., Ltd., has been incorporated under the British Columbia Companies Act, with $100,000 capital, and office at Vancouver, to carry on a general tug and navigation business.

Capt. E. McCoskrie, formerly master of the C.P.R. s.s. Amur, but who has for the past few years been engaged in private business, has been appointed as the first harbor master of Prince Rupert.

The C.P.R. British Columbia Coast Service will commence a direct steamship service, early in May, between Victoria and Tacoma, calling at Seattle. The s.s. Iroquois will be placed on the run, daily, except Sundays, between these points.

The C.P.R. British Columbia coast steamships Princess Victoria and Princess Patricia (formerly Queen Alexandra), are being fitted at Victoria with the oil burning equipment. The steamships Charmer and Princess Ena are also being overhauled at the same port.

The Western Canada Lumber Co. is

having a steam tug named Dreadful built on the Thames, Eng., for the towing of logs from Comox to Howe Sound. She is 125 ft. long, and will cost about $60,000. She was expected to leave England during April for Vancouver.

The steamer Jessie Mac, owned by Capt. John McDawen, Vancouver, has been sold to H. Eaden for $10,000. She was built at Vancouver in 1905, and is equipped with engine of 8 n.h.p., driving a screw. Her dimensions are, length 61.5 ft., breadth 16 ft., depth 7.5 ft.; tonnage 57 gross, 39 register.

A. A. Watson, a well-known shipbuilder on the Pacific coast, died recently at Victoria, aged 79. He was born in Scotland, and settled in Vancouver Island, then a Crown colony, in 1863. He designed and built a number of stern wheel steamboats for river service, and was at one time in the Canadian Pacific Navigation Co.'s service.

A press report from Victoria states that a company has been formed in England, and the capital subscribed in London and Paris, to build a floating dry dock for Vancouver. It is stated that the dock will have a lifting power of 15,000 tons, will be so constructed that it can be used in sections for small vessels, and will be 600 ft. long, 80 ft. wide and 55 ft. deep.

The Marine Transportation Co., which has recently been formed for the purpose of operating the s.s. Rupert City, which it has acquired, will, it is reported, shortly order, or purchase, a vessel in Great Britain, to run in conjunction with it. The officers appointed to the Rupert City are given as:—Capt. Stewart, secretary, Vancouver Shipmasters' Association, captain; J. Johnson, chief engineer.

It is reported from Vancouver that the Port of Vancouver Drydock Co., formerly the Imperial Car, Shipbuilding and Drydock Co., has secured a considerable British and French backing, and has placed an order for the construction of a drydock and machinery, in Glasgow, Scotland. It is stated that the plant will be located at Roche Point on Burrard Inlet, where about 500 acres are reported to have been secured for the purpose, and for business sites, and that the dock will be built so that it can be enlarged, the plans showing a length of 650 ft., and a width of 35 ft., with a lifting capacity of 15,000 tons.

Capt. C. H. Nicholson, Manager, G.T.P. Coast Steamship Co., has replied to the complaints of the Shipmasters' Association, as to the alleged danger caused by the location of the company's oil storage tanks on the water front at Vancouver, that before construction was undertaken, the plans were submitted to the local building inspector and the Fire Underwriters, and approved by them, that the whole construction is absolutely fireproof, and that as the oil used would have to be heated to 250 deg. F. before it would ignite, sparks from locomotives, even if they could reach the oil, would not constitute a danger.

The British s.s. Rupert City, which has been lying idle at Vancouver for over a year, is reported to have been sold to S. P. Dunlevy, Vancouver, for $50,000. It is stated that she will be overhauled and operated in the freight trade between Vancouver, Tacoma and Portland, and Mexican ports. She was formerly known as the Powhatan, and was built at Barrow, Eng., in 1886, her dimensions being, length 310 ft., breadth 38.2 ft., depth 25.3 ft.; tonnage, 2,536 gross, 1,640 register. She is equipped with quadruple expansion engines with cylinders 18, 18, 38 and 60 ins. diar. by 42 ins. stroke, of 254 n.h.p. She was engaged in the Chinese coolie service with Mexico for several years, and on the stoppage of that service, was laid up at Hong Kong, and was later operated in the Prince Rupert trade, by Mackenzie Bros., of Vancouver, and later, for the remainder of her charter period, in the coal trade to Alaskan ports.

Canadian Notices to Mariners.

The Department of Marine has issued the following:—

18. Mar. 28. 47. British Columbia, Vancouver Island, west coast Kyuquot sound, Kokshittle arm, unchartered rock, buoy established. 48. British Columbia, Vancouver island, east coast, Moresby passage, Canoe rock, light established on beacon. 49. British Columbia, Active pass, Galiano island, Mary Anne point, white sector inserted in light. 50. British Columbia, Baynes sound, Denman island, red sectors inserted in light.

19. Mar. 30. 51. Ontario, Lake Ontario, east end, Little Cataraqui bay, range lights established near Portsmouth. 52. Ontario, Lake Ontario, chart, Main Duck island to Presqu'ile, issued. 53. Ontario, Niagara River, Cnippawa, Hog island, lighthouse established. 54. Ontario, Lake Huron, north channel, Blind river, buoyage.

20. Apr. 10. 55. Nova Scotia, Cape Breton island, east coast, Sydney harbor, southeast bar, red sector inserted in light.

21. Apr. 15. 56. Ontario, Lake Ontario, Toronto harbor, range lighthouses under construction at the new western entrance, temporary lights. 57. Ontario, Lake Erie, Rondeau harbor, gas lighted beacon established on west breakwater pier. 58. Ontario, Lake Huron, shoal water in the entrance to Goderich harbor, caution. 59. Ontario, Georgian Bay, Owen Sound, back range light again in operation.

22. Apr. 18. 60. Ontario, River St. Mary, St. Joseph island, Sailors Encampment range, front light again in operation. 61. Ontario, Lake Superior, Thunder Bay, Hare island reef, change in position of gas and bell buoy, caution.

Telegraph and Cable Matters.

The Great North Western Telegraph Co. has closed its offices at Embro and North Augusta, Ont., and Longue Pointe, Que.

N. R. Duetta has been appointed agent, Great North Western Telegraph Co., at Trenton, Ont., vice A. Christie. This is a new telegraph office.

The Canadian Northern Telegraph Co. has opened offices at Woodnorth, Man., Munson, Alta., and has closed its offices at Steep Rock, Ont., and Mistatim, Sask.

G. Marconi, who was in Canada during April, in connection with the Marconi Wireless Telegraph Co.'s affairs, has been made a life member of the Italian senate.

W. R. Thom has been appointed agent, Great North Western Telegraph Co., at Cobourg, Ont., vice F. M. Hawley, who has resigned after a number of years in the company's service.

The Dominion Government has commenced a night lettergram service over its telegraph lines, similar to the service adopted some time ago by private companies throughout the continent.

The Marconi Wireless Telegraph Co. of America has absorbed the United Wireless Telegraph Co., and settlements have been made in the actions by the former company for infringement of patents.

The annual convention of the Association of Railway Telegraph Superintendents will be held in New York, June 4 to 7, when a comprehensive programme of business and entertainment has been arranged, including a visit to the T. A. Edison Co.'s works at Orange, N.J.

L. DeForest, at one time of the Dominion DeForest Wireless Telegraph Co., and now of the American DeForest Wireless Telegraph Co., and a number of his associates have been arrested in the U.S. on charges of misusing the mails by misrepresenting conditions in connection with his company.

In response to a question in the British House of Commons, Apr. 2, the Postmaster General stated that the Government was not in favor of a state owned cable across the Atlantic, nor of granting a subsidy for the laying of one. If, however, any company offered to lay a cable and carry messages at a lower rate than now charged, the proposal would be welcomed.

W. J. Camp, Assistant Manager, C.P.R. Telegraphs; W. W. Ashald, Superintendent of Telegraphs, G.T.R.; Montreal; E. D. Hubbard, General Foreman, G.T.R., Battle Creek, Mich.; T. Rodger, Inspector of Telegraphs, G.T.R.; and A. D. Smith, Northern Electric and Manufacturing Co., Montreal, were among those who attended the recent joint meeting of the eastern and western divisions of the Association of Railway Telegraph Superintendents at Chicago, Ill.

The following changes have been made on the C.P.R. Telegraphs, Western Lines —C. K. Brown has been appointed Inspector of Telegraphs, District 1, Saskatchewan Division, Moose Jaw, vice C. Fraser, who has been transferred to District 2, Regina, succeeding S. M. Thurston, appointed Circuit Manager at Moose Jaw; L. A. Hutton has been appointed Inspector of Telegraphs, District 2, Alberta Division, Calgary, vice C. H. Powell, who has been transferred to District 1, Medicine Hat, succeeding J. J. Schetgen, appointed chief operator at Calgary.

The Western Union Telegraph Co., which controls the Great North Western Telegraph Co., has instituted a pension scheme for its employes, which provides, that after 20 years service, and up to and including the 25th year, the pension will be 1% of the average salary for the last preceding 10 years, multiplied by the number of years service; after 25 years, and up to and including the 35th year, 1½% addition for each year; from the 35th to 40th years, 2% additional for each year and after 40 years service 50% of the average salary for the last preceding 10 years. The minimum pension is to be $25 a month, except when otherwise directed, and no pension is to exceed $100 a month.

The Saskatchewan Elevator Co., Ltd., has been incorporated under the Dominion Companies Act, with $250,000 capital, and office at Winnipeg, Man., to carry on a general grain and elevator business, and to take over as a going concern the Saskatchewan Elevator Co., Ltd., of Saskatchewan.

The Keewatin and Western Construction Co. has been incorporated under the Manitoba Companies Act, with office at Winnipeg and authorized capital of $100,000, to carry on a railway and general contracting business. The provisional directors are:—F. G. Thompson, D. S. Johnston, J. C. Kyle, H. Henry, J. B. Henderson, Winnipeg.

Bell Telephone Co.—At the annual meeting in Montreal recently, C. F. Sise, President, stated that the net revenue for 1911 was $1,425,835, out of which $1,000,000 had been paid in dividends. The number of instruments earning rental was 153,959, and the system comprised 58,300 miles of wire, of which 4,167 miles were added during 1911. After all deductions there was a balance of $120,415 to be carried forward. The following were re-elected for the current year:—President, C. F. Sise; Vice President, Hon. Robt. Mackay; other directors, T. N. Vail, R. Archer, W. R. Driver, H. Paton, C. Cassils, H. B. Thayer, L. B. McFarlane and Z. A. Lash, K.C.

Cantilever Framed Steamships for the St. Lawrence Coal Trade.

Furness, Withy & Co., of West Hartlepool, Eng., Montreal, etc., are having built at Middlesbrough, Eng., by Sir Raylton Dixon & Co., Ltd., two steamships, Lingan and Hochelaga, which have been specially designed to meet the requirements of the Dominion Coal Co.'s trade from Sydney, N.S., to Montreal, and are of the latest improved type of patent cantilever construction with top-side water ballast tanks with which most of the vessels in this trade are fitted.

Their principal dimensions are 388 ft. 3 ins. by 52 ft. by 29 ft. 9 ins. moulded, and have a deadweight carrying capacity of about 7,600 tons each on a light draft of water. They are being constructed to the highest class British Corporation, and are of the single deck type with poop, bridge and forecastle

Each vessel has 11 hatchways, four holds absolutely free from all obstructions, such as beams, pillars or web frames, and perfectly self-trimming owing to the sloping sides of the top-side tanks at each side of the ship, and of the total amount of about 2,400 tons of water-ballast which the vessel can carry, about half will be in the top-side tanks.

They each have 12 derrick posts and 20 derricks, 4 boats, hand and steam steering gear and are equipped with 10 steam winches, steam windlass, etc., and all the latest and most modern appliances for the rapid handling of cargo.

They have triple expansion engines, having cylinders 26, 44, and 73 by 48 ins. stroke, supplied with steam by three large single-ended boilers working at 180 lbs. pressure.

The trials passed off most successfully, a speed of over 12 knots being attained.

Examinations for Inland Masters and Mates.

Following the suggestions made by the Dominion Marine Association to the Minister of Marine in February in reference to changes considered necessary in examinations for masters' and mates' certificates for inland waters, the whole question is under the Department's consideration with a view to afford better facilities to candidates and to organize a better system of examinations, which will, no doubt, be to some extent, in harmony with the Association's suggestions.

The Department has pro tem opened a school for the education of candidates at one of the ports and is willing to consider the question of assistance to the various technical schools, of which three have now been opened at large ports. These schools intend giving courses in navigation, etc., to those desiring to undergo examinations for marine certificates, both officers and engineers.

Comparative Costs of Fuel on Ocean Steamships.

In view of the interest at present being taken in the use of fuel oil for steamship operation, the following figures, which have been quoted in London, Eng., for a trip between Liverpool and New York, with the s.s. Lusitania as a basis, are given:—

Coal, 5,500 tons, at 18s 6d	£5,087	10	0
312 firemen, at 25s a week	390	0	0
	£5,477	10	0
Oil, 3,300 tons, at 26s	£4,292	0	0
27 firemen, at 25s a week	33	15	0
	£4,325	15	0

Canada Shipping Act Amendments.

The Dominion Parliament has passed a bill providing for the repeal of sec. 100, chap. 113 of 1906, and sec. 7, chap. 65 of 1908, and for the insertion of a new section 100, as follows:—

"The foregoing provisions as to masters and mates shall not apply to pleasure yachts not carrying passengers or goods for hire, nor to steamships of not more than five tons gross tonnage, nor to barges nor other vessels having neither masts, sails nor rigging, and not being steamships, nor ships employed solely in fishing, nor to sailing ships of not more than 100 tons, registered tonnage, propelled by auxiliary power other than steam, employed partly in fishing and partly in the carriage of freight."

This exempts sailing ships fitted with auxiliary power from having to employ certificated masters or mates. Such vessels would be exempt under the previous law if employed solely in fishing. As they are engaged in carrying cargo, when not fishing, the law has been amended in this respect. Sec. 104 is also repeated and replaced by a new section, as follows:—

"Whenever any master or mate or second mate proves to the satisfaction of the Minister that he has, without fault on his part, lost or been deprived of any certificate required under this part, the Minister may, upon such terms and conditions as he deems fit, cause a copy or duplicate of the original certificate to be made out and certified as aforesaid, and to be delivered to such master, mate or second mate."

Under previous conditiois, one half the full fee was charged for a duplicate certificate, which was considered excessive. Under the amendment the Minister can fix what he considers to be a reasonable fee.

The Dominion Government has included in the supplementary estimates $50,000 for the improvement of Goderich harbor. It is stated that this will be spent on the continuation of the present north-west breakwater.

The Steel Co. of Canada, Ltd. Annual Report.

Following are extracts from the report for the year 1911:—

The net profits after expending $404,453.11 for repairs, maintenance and improvement on plants and machinery were $1,373,522.81. These profits have been dealt with as follows:—

Interest on bonds and mortgage and cost of underwriting and stamping bonds	$ 484,100.40
Dividends on preferred stock	454,741.00
Credited to fund for depreciation, renewal and improvements of plants	100,000.00
Carried to credit of profit and loss account	337,681.41
	$1,373,522.81

The amount now at the credit of depreciation, renewal and improvement of plants fund is $204,071.11, and at the credit of the profit and loss account, $583,599.74.

Your directors feel that the statement is a very satisfactory one when it is taken into consideration that the past year was one of great depression in the U.S. iron and steel business. The demand in Canada for our various products was excellent, but an abnormal percentage was supplied from the U.S. at exceptionally low prices, owing to the depression referred to, particularly pig iron, bars and wire products. The prices on bars were so low that only the largest plants in the U.S. could produce them at a cost which would give a meagre margin of profit. In pig iron prices were still worse. Few, if any, of the U.S. furnaces made money, as pig iron was being sold below the average furnace cost, and the prices for export to Canada were cut from 50 to 75c a ton below those for their home market. Not only have we had to contend with the low prices on pig iron, but the Government regulations as to rebates on iron entering into agricultural machinery are so framed, that it practically prohibits the makers of agricultural machinery from using Canadian pig iron even in the machines where the material which enters into them is not subject to rebates. To enable us to run our plants full and absorb our overhead charges, and thereby secure the greatest economy, we were forced to sell goods at a very small profit.

In the trust deed for the bond issue provision was made for an additional issue of $650.000.00 of bonds, the proceeds of which were to be used for providing further working capital. These bonds were sold during the year, and the total bond issue is now $7,500.000.00, as compared with $6,850.000.00 as shown on the previous statement.

The matter of the growth of Canada, and the necessity of our being able to take care of the increased consumption of iron and steel commodities, has been one that has had the serious consideration of your directors and officers, and it was decided, to enable us to take care

The s.s. Lingan, for the St. Lawrence Coal Trade.

of this increased demand, that considerable additions must be made in machinery equipment at our various plants, and that a blooming mill, billet mill, and rod and bar mill should be built at Hamilton, together with two more 50-ton open hearth furnaces. The mills and open hearth furnaces are under construction, and we hope to have them in operation next fall. The new machinery referred to is being installed. The mills will be of the most up-to-date design, and should enable us to produce bars at a lower price than we have heretofore. To help defray the cost of these extensions and improvements the sale of $500,000.00 of bonds has been arranged for.

Canadian Westinghouse Company Ltd.

Following are extracts from the annual report for the year 1911.—

The net profits were $1,010,153.56, an increase of 45% over 1910, the year of previous maximum. From the year's profits regular quarterly dividends at the rate of 6% per annum, and bonus dividends aggregating 2%, (making a total for the year of 8%), have been paid, amounting to $350,128. $100,000 has been added to the general reserve for depreciation of property and plant, increasing that reserve to $500,000. $50,000 has been added to the reserve for inventory adjustment, which now totals $100,000, and which should be adequate to safeguard the possibility of decrease in market values of either raw materials or finished product. A reserve of $50,000 has been created for an insurance fund, the directors having in mind the advisability at some future date of the company carrying certain special lines of its own insurance risks. Pursuant to previous policy, against items not immediately productive from a manufacturing standpoint included in property and plant account, $135,794.05 has been written off. The remaining balance, $324,231.51, has been carried forward to the credit of profit and loss account, which shows as of Dec. 31, 1911, a total unapportioned surplus of $1,050,844.73.

The year opened with a number of large contracts on hand well advanced through their design and into their manufacturing stages, which situation, taken along with a constant influx of new business in large quantities, produced a condition tending to bring about more than ordinarily satisfactory returns for the year. The volume of output increased approximately 40% over the previous year, and the high standard previously set up in design, engineering application, and quality has been fully maintained.

In accomplishment of the foregoing, the extensions to plant have been an important factor. The extensions to warehouse, foundry and pattern building were completed early in 1911, and the plant has been further increased this year by a new main machine shop aisle, which is now nearing the stage of completion looking toward the installation of the necessary machine tool equipment. Coincident with all these extensions the former boiler plant has been rebuilt with all modern labor-saving appurtenances in a manner to correspond with the added requirements of present plant additions and as well to permit installation of extra units should further factory extensions require. The construction of these buildings has been carried out on the same lines of solidity and permanency in general plan and in execution of detail as marked the original buildings, and the construction of all additions has been carried forward without interruption to manufacturing operations in the existing plant, due to the engineering skill embodied in the original layout of the building scheme.

In accordance with established conservative custom, the business of the year has absorbed ample charges to cover maintenance and renewal accounts, expenditures for development work in both engineering and manufacturing lines, and amounts representing concurrent loss in value on those special manufacturing appliances where the decrease in values is at a more rapid rate than ordinary depreciation.

Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time, we wish our readers to distinctly understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

H. D. Bayne, Special Agent, Canadian General Electric Co., has sent his friends a wall hanger, "Suggestions for 1912," containing as usual a number of excellent maxims.

The McKeen Motor Car Co., Omaha, Neb., has opened an office in the Hudson Terminal Bldg., 30 Church St., New York city, with S. D. Barnett as Eastern Representative.

Robert W. Hunt, and Co. Ltd., engineers, inspection, testing, analyses and consultation, with head office in Montreal and branch in Toronto, have opened an office at 415 Bank of Ottawa Building, Vancouver, B.C., under the management of G. E. Herrmann.

The McKeen Motor Car Co., Omaha, Neb., has received an order from the Weatherford Mineral Wells and North Western Rd. for two 70-ft. motor cars. There are now 122 McKeen motor cars in service in the United States, Mexico and Australia.

The Independent Pneumatic Tool Co., Chicago, Ill., has issued catalogue 9, describing Thor air tools. It contains 118 pages of matter copiously illustrated. Copies may be obtained of the Canadian agents, H. W. Petrie, Ltd., Toronto and Vancouver.

"American Vanadium Facts," for March, issued by the American Vanadium Co., Pittsburgh, Pa., refers especially to the useful strength of steel, the rail problem and the adoption by the American Locomotive Co. of chrome Vanadium for heat treated steel for locomotive crosshead keys.

"Brownhoist Patent Suspended Bins," issued by the Brown Hoisting Machinery Co., Cleveland, Ohio, describes the bin fully and shows a number of installations of it and also of several Brownhoist machines which work in connection with the bin in power plant installations. It contains considerable interesting matter on handling coal and ashes in power plants, and illustrates a suspended coal bin installed for the Winnipeg Electric Ry.

The Brown Hoisting Machinery Co.'s catalogue D 1912 fully describes and illustrates its overhead, or tramrail, system of handling all kinds of material, which is being adopted by modern industrial plants and railways. It has proved that a great saving can be made by its adoption by both large and small installations. The list covers electric monorail man trolleys, patent steel-plate equalizing trolleys, and electric hoists, with all the necessary equipment, and instructions for ordering.

The name of the Advance Machine Works, Ltd., Walkerville, Ont., manufacturers of Northern cranes and hoists in Canada, has been changed to Northern Crane Works, Ltd. They will continue the manufacture of cranes, hoists, etc., as heretofore. They have recently completed a new plant in Walkerville, and report a large number of contracts in progress covering electric travelling and hand power travelling cranes and electric hoist work, also an increasing demand for Northern patented type E electric travelling cranes.

The Dominion Marine Department has ordered 40 buoy lanterns from the Safety Car Heating and Lighting Co., of New York and Montreal. These lanterns have been developed by this company to meet the demands of Lighthouse Bureau requirements. They are supplied with improved flashing mechanism capable of giving a double characteristic; that is, one second light, one and one-half seconds dark, one second light and five seconds dark; the short and long dark periods alternating with one second light periods intervening. They are known as 200 mm., and will be used for coast, harbor and river lighting.

The American Boiler Manufacturers' Association at its recent convention at New Orleans, La., authorized the secretary of the Supplymen's Association to publish a list of boiler manufacturers in the United States and Canada. This list comprises 1,000 names of boiler manufacturers, which have been verified through mercantile agencies, and by direct correspondence, and will be of interest to manufacturers of tools used in boiler shops, material men, mechanical engineers, and boiler buyers. The book is also arranged with a column in which the credit rating and financial responsibility can be inserted. It can be obtained, price $5, from F. B. Slocum, Secretary, Supplymen's Association, Continental Iron Works, West and Calyer Sts., Brooklyn, N.Y.

The U.S. district court at Milwaukee, Wis., has appointed receivers for the Allis-Chalmers Co., the receivership being of a friendly nature and necessary to complete the company's organization. Under the reorganization plan the bondholders and preferred and common stockholders agreed to give up their securities and to accept instead preferred and common stock in a new company. The elimination of the bonds, $11,148,000, relieved the company from a heavy burden of fixed charges. New capital amounting to $5,192,000 was raised by assessment on the outstanding preferred and common stock of the old company. The result is that the company will be placed in a far stronger position than it ever was before. Allis-Chalmers-Bullock, Limited, Montreal, is a Canadian company, and entirely distinct from the Allis-Chalmers Co., but it will doubtless benefit materially by its U.S. ally's reorganization.

The agency business formerly carried on by Eadie-Douglas, Limited, at 304 University St., Montreal, has been reorganized and the name changed to Douglas-Milligan, Limited, with H. P. Douglas, President; G. M. Milligan, Vice President, and E. M. Watson, Secretary-Treasurer. The Toronto branch in the Confederation Life Building is under the management of W. F. Gouiniock, and the company has agents in the other principal cities. Its agencies include B. F. Sturtevant Co., Boston; Keystone Fireproofing Co., New York city; Leeds Forestry Co., Leeds, Eng.; McFarlane-Douglas, Ottawa; Terrano Jointless Flooring; Alphonse Custodis Chimney Construction Co.; Edward Darby and Sons Co., In., Philadelphia; Avery Scale Co., North Milwaukee; Esco preservative steel paint; Preservo and Ceresit waterproofing; Reliance ball bearing door hangers; De La Vergne Machine Co.; Jewett Refrigerator Co.; Etcher Wyss and Co., Richardson-Phœnix Co.; Roberts Manufacturing Co.; Nelson valves; N.S. gauges; Sweet's separators; Metropolitan injectors, Blackburn-Smith feed water filters.

Canadian General Electric Co's Annual Report.

Following are extracts from the report for the year 1911:—The profits, $1,405,889.70, were the largest in the company's history, recent additions to plant and equipment having permitted of manufacturing in greater volume without materially increasing overhead expense account. There has been written off for depreciation $353,721.63, and interest on borrowed capital the sum of $162,422.66 has been paid, leaving a balance of $889,745.41. Deducting from this amount dividends on preference and common stock at the rate of 7% per annum, amounting to $525,109.37, there remains a net balance of $364,636.04, which has been carried to the credit of profit and loss. This sum added to the balance to the credit of that account at the end of 1910 makes a present balance of $675,779.35, which together with the reserve fund of $1,669,531.95 makes a total surplus of $2,345,311.30.

The volume of business transacted being much larger than in previous years, the current liabilities have necessarily increased, in order to take care of work in progress, but against these current liabilities current assets amount to $7,926,840.96.

During the year the company acquired the property and assets of the Sunbeam Incandescent Lamp Co. of Toronto, and contracts have been let for additions to the buildings and equipment which will double the capacity of this plant. A new stores building at the Peterborough works, 325 x 80 ft., is being erected, and plans have been accepted for the erection of a new plant in Toronto for the ornamental iron, bronze, and art metal department, the growth of which has surpassed expectations. With the above extensions and additions the manufacturing facilities will enable the company to materially increase its production.

The real estate owned is carried on the books at a valuation far below market values, the appreciation being conservatively estimated at upwards of $500,000. It was proposed to write this up to more nearly its present price, but the directors have decided to allow this asset to continue to remain on the books at the present low valuation.

The directors have passed a bylaw providing for increasing the authorized capital stock to $12,000,000, of which increase shares to the par value of $1,900,000 will be offered to all holders of ordinary shares of record on April 20, 1912. The growth of business renders this policy advisable, and the only extra charge to the company will be the difference between the rate of dividend paid to the shareholders and the rate of interest paid to the company's bankers.

New Fishery Protection Vessel for Service on Pacific Coast.

TENDERS are invited and will be received by the undersigned for the design and construction of the above vessel up to noon 17th June, 1912.

General particulars and a guidance print shewing the typical nature of the vessel required, for information in preparing a design, may also be obtained on application to the undersigned.

The vessel is to be delivered free of all charges at H.M.C. Dockyard, Esquimalt, the time of delivery to be stated in the tenders. Special consideration will be given to early delivery.

An alternative tender may be submitted if so desired, using Diesel Heavy Oil Engines as the motive power for propulsion, but such engines would be required of the 2 cycle reversible type, designed to use Texas and other heavy oils.

The Department does not bind itself to accept the lowest or any tender, the awarding of the contract will depend on the suitability of the design for the service required as well as a consideration of the tender price.

The tenderer should also state for what price two vessels of the type proposed will be supplied.

A certified cheque payable to the Deputy Minister of the Naval Service, amounting to $10,000, must accompany design and tender, as a guarantee that the contract will be undertaken if awarded. If two vessels are decided on a further deposit of $10,000 will be required.

G. J. DESBARATS,
Deputy Minister of the Naval Service.
Department of the Naval Service.
Ottawa, 9th April, 1912.

Department of Railways and Canals, Canada

SAULT STE. MARIE CANAL.

NOTICE TO CONTRACTORS.

SEALED TENDERS, addressed to the undersigned and endorsed "Tender for Widening Lower Entrance Channel-way, Sault Ste. Marie Canal," will be received at this office until 16 o'clock on Friday, May 10th, 1912.

Plans, specifications and the form of the contract to be entered into, can be seen on and after the 10th April, 1912, at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, and at the office of the Engineer in Charge, Sault Ste. Marie, Ont., at which places form of tender may be obtained.

Parties tendering will be required to accept the fair wages schedule prepared or to be prepared by the Department of Labour, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered, unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $2,500.00, made payable to the order of the Minister of Railways and Canals, must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work at the rates stated in the offer submitted.

The cheque thus sent in will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security, for the due fulfilment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,
L. K. JONES,
Secretary.
Department of Railways and Canals,
Ottawa, 8th April, 1912.

Newspapers inserting this advertisement without authority from the Department will not be paid for it.—21126.

Department of Railways and Canals.

LACHINE CANAL.

Leasing of Government Sheds at Montreal.

SEALED TENDERS addressed to the undersigned and endorsed "Tender for Sheds," will be received until 16 o'clock Wednesday the 1st May, 1912, for the leasing for a period of five years of the following Government Sheds or space in same at so much per square foot, viz.:—Flour Sheds Nos. 1, 2, 3, 4 and 5, and Shed No. 1 and part of Shed No. 2 on St. Gabriel Basin.

Possession of Sheds to be had on or about the 1st May next, with the exception of Flour Shed No. 3, which will not be available until about the 1st October.

Full particulars and all necessary information may be obtained at the office of the Superintending Engineer of the Canals of the Province of Quebec, No. 2 Place d'Armes, Montreal.

The Department does not bind itself to accept the highest or any tender.

By order,
L. K. JONES,
Secretary.
Department of Railways and Canals,
Ottawa, 20th April, 1912.

Newspapers inserting this advertisement without authority from the Department will not be paid for it.—21791.

MALLEABLE IRON CASTINGS
Galt Malleable Iron Co., Limited - - Galt, Ontario

THE PRATT AND LETCHWORTH CO. LTD.
BRANTFORD, ONT.
MISCELLANEOUS MALLEABLE CASTINGS AND RAILWAY SPECIALTIES
NON-CORROSIVE MALLEABLE TIE PLATES AND RAIL BRACES.

FOR TICKET CASES AND COMMERCIAL FURNITURE
of all descriptions to stock or special design, apply to
The Canadian Office & School Furniture Co. Limited
Preston Ontario

The Parry Sound Lumber Co.
Limited
1315 Traders Bank Bldg., Toronto
Manufacturers of
PINE, HEMLOCK, LUMBER, BRIDGE TIMBER, RAILWAY TIES, TELEGRAPH POLES, LATH, SHINGLES, BOX SHOOKS.

Norton Griffiths & Co.

LIMITED

W. BURTON STEWART, Managing Director.

Engineers and Public Works Contractors.

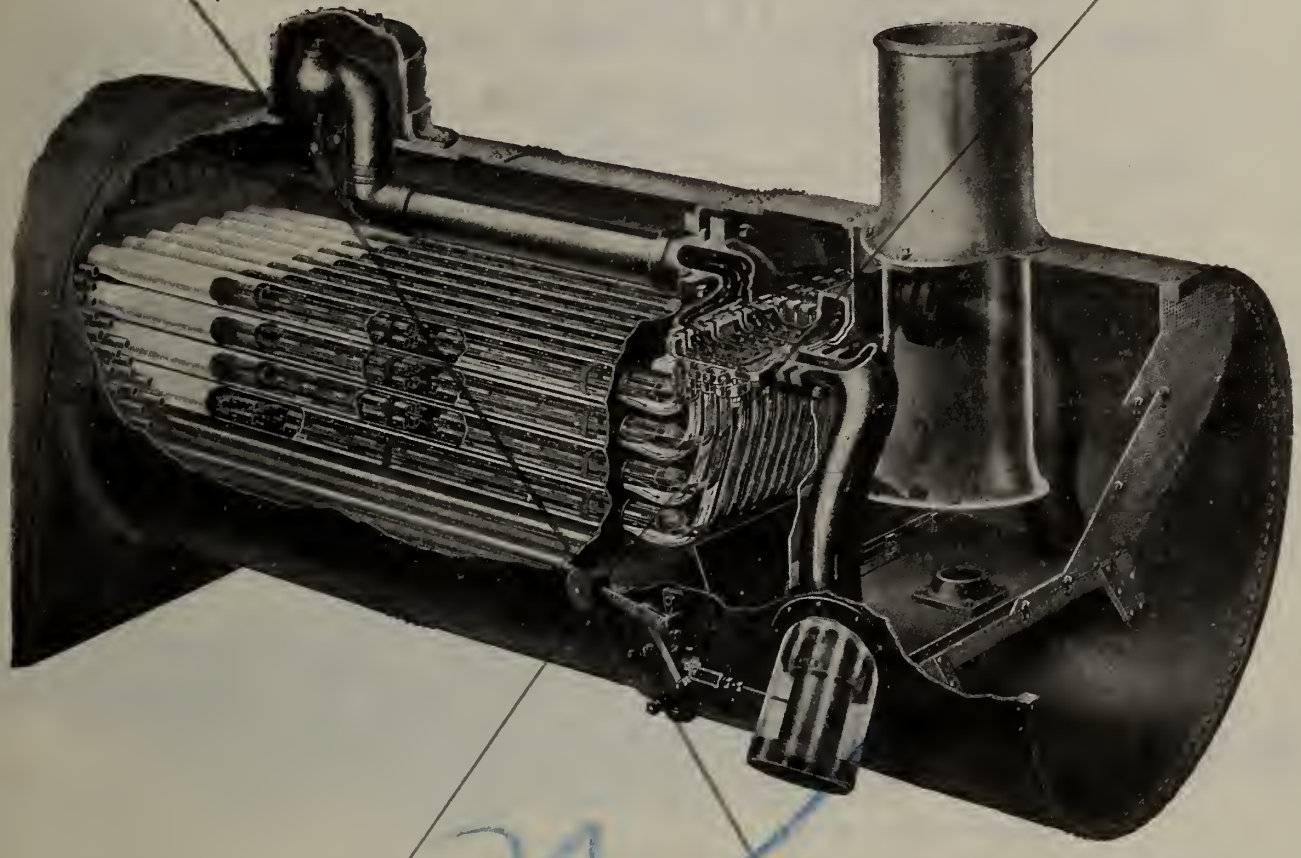
Contractors to the Dominion Government for the harbor improvements, dry dock, etc., at Courtenay Bay, St. John, N.B.

Head Office: 409 Cotton Building, Vancouver, B.C.

Branch Office: 502 Mark Fisher Building, Montreal, Que.

SIMPLE EFFICIENT ACCESSIBLE

SCHMIDT SUPERHEATER



25% COAL SAVING MEANS
33⅓% INCREASED HAULING CAPACITY

Superheated Steam Locomotives show a saving of 25 per cent. in coal burned over saturated steam locomotives developing the same power. Basing the amount of coal burned upon the amount that it is possible to fire per hour, this means an increased hauling capacity of 33⅓ per cent.

Consider, for example, the maximum amount of coal possible to fire per hour at 6,000 lbs. At 4 lbs. of coal per horse power hour $\left(\frac{6000}{4}\right)$ we obtain 1500 horse power hours per hour. At 3 lbs. of coal per horse power hour or a saving of 25 per cent. $\left(\frac{6000}{3}\right)$ we obtain 2000 horse power hours per hour.

2000 — 1500 equal 500 horse power hours per hour increase.

$\frac{500}{1500} = \frac{1}{3}$ or 33⅓ per cent. increased power, or *hauling capacity*, developed with the *same amount* of coal burned.

LOCOMOTIVE SUPERHEATER COMPANY

People's Gas Building
Chicago, Ill.

30 Church Street
New York, N.Y.

Canadian Cold Car Heating & Lighting Co. Ltd.

492 ST. PAUL STREET, MONTREAL, QUE.

MANUFACTURERS OF

Electric, Steam and Hot Water Heating Apparatus for Railway Cars

Catalogues and Circulars Cheerfully Furnished. Improved System of Acetylene Car Lighting.

Send for Circular of our New Combination Pressure and Vapor Car Heating System

Largest Manufacturers in the World of Car Heating Apparatus

"Little Giant" New Ratchet Close Quarter Drill

Made in two sizes. Capacities ¼ in. and 2 ins. In Iron or Steel

MANUFACTURED BY

Chicago Pneumatic Tool Company

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TORONTO, Ont.

150 Princess Street
WINNIPEG, Man.

429 Pender Street
VANCOUVER, B.C.

A HISTORY OF THE PAY-AS-YOU-ENTER CAR

AND ITS LESSON

The following cities are using Pay-As-You-Enter Cars: Chicago City Railway, 839 cars; Chicago Railways, 1,328; Public Service Corporation of New Jersey, 466; New York City Railway, 555; Third Avenue Railroad, New York, 550; International Railway, Buffalo, 200; Buffalo & Lake Erie Traction Co., 10; Washington Ry. & Elec. Co., Washington, D.C., 100; Capital Traction Co., Washington, D.C., 51; Municipal Traction Co., Cleveland, Ohio, 180; United Rys. Co. of St. Louis, Missouri, 310; Portland Ry., Lt. & Pwr. Co., Portland, Ore., 25; Columbus Ry. & Lt. Co., Columbus, Ohio, 10; Wichita R.R. & Lt. Co., Wichita, Kan., 14; Jacksonville Elec. Co., Jacksonville, Fla., 5; Dallas Elec. Co., Dallas, Texas, 20; Houston Elec. Co., Houston, Tex., 41; Northern Texas Trac. Co., Ft. Worth, Texas, 25; Ithaca Street Ry., Ithaca, N.Y., 2; Peoria Street Ry., Peoria, Ill., 13; Urbana & Champaign Ry., Champaign, Ill., 3; Mutual Lt. & Water Co., Brunswick, Ga., 4; Rochester Ry. Co., Rochester, N.Y., 25; Ft. Dodge, Des Moines & So. R.R. Co., 2; Muskogee Elec. Trac., Muskogee, Okla., 6; Union Traction Co., Dubuque, Ia., 4; Topeka Ry. Co., Topeka, Kas., 12; United Rys. & Elec. Co., Baltimore, Md., 32; Detroit United Ry., Detroit, Mich., 225; Cincinnati Traction Co., Ohio, 50; Montreal Street Railway, 400; British Columbia Elec. Ry., 30; Calgary Street Railway, 18; Metropolitan Street Ry., Kansas City, Mo., 50; Edmonton Radial Ry., 4; San Antonio Traction Co., San Antonio, Tex., 6; Rockford & Int. Ry., Rockford, Ill.; Cairo Street Ry. & Lt. System, 6; Des Moines City Railway, Iowa, 12; Macon Ry. & Lt. Co., Macon, Ga.; Virginia Ry. & Power Co.; Columbia Elec. St. Ry. & Lt. & Power Co., Columbia, S.C.; Aurora, Elgin & Chicago Ry., Chicago, Ill.; Wichita Falls Traction Co., Wichita Falls, Tex.; Ottawa Electric Ry. Co., Ottawa; Bloomington & Normal Ry. & Lt. Co., Bloomington, Ill.; Corsicana Transit Co., Corsicana, Tex.; Compania Electrica y de Ferrocarriles, Mexico; The Milwaukee Elec. Ry. & Lt. Co., Milwaukee, Wis.; Springfield Street Ry. Co., Springfield, Mass.; Lynchburg Traction Co., Lynchburg, Va.; Chicago & Southern Traction Co., Chicago, Ill.; Calumet & South Chicago Ry. Co., Chicago, Ill.

THE LESSON

taught by this widespread use of Pay-As-You-Enter Cars is obvious. Increased Revenue, Accident Elimination and Schedule Improvement have been demonstrated in every case. Isn't all this sufficient to show that it always pays to operate the Pay-As-You-Enter Car? Why not remodel some of your present cars?

We license manufacturers and railways to build and use the Pay-As-You-Enter Car, the Patents on which are owned by

ROSS & McDONALD, PATENTEES, - - 78 CRAIG STREET WEST, MONTREAL

THE

NEW HOTEL BREVOORT CHICAGO

The Twentieth Century Hotel — Absolutely Fireproof

Centrally located. Near-by cars of all Stations. All rooms are outside rooms. Baths Connecting. Restaurant. Grill Room. Unsurpassed in Appointments and Decorations. Table Unexcelled. Prices Moderate.

A. D. HANNAH & D. HOGG, PROPRIETORS

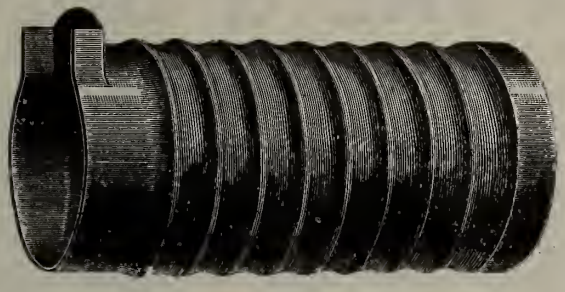
ARTHUR M. GRANT, MANAGER

KEEP STANDING CHANGE

MORISON Suspension Furnaces

The Universally satisfactory record of "THE MORISON" proclaims it the best furnace made.

With Plain Ends or Flanged to any required shape.



For Land and Marine Boilers

Uniform Thickness, Easily Cleaned, Unexcelled for Strength, Unsurpassed for Steaming Capacity.

Manufactured by

THE CONTINENTAL IRON WORKS

West and Calyer Sts., BOROUGH OF BROOKLYN, New York

Near 10th and 23rd St. Ferries

Canadian Sales Representatives: THOS. ROBERTSON & CO. LTD., 134 Craig St., Montreal.

DOMINION IRON & STEEL CO. LIMITED

MANUFACTURERS OF

BASIC OPEN HEARTH STEEL RAILS

Order Books are now open for delivery during 1912. Intending Purchasers should place orders early to insure prompt delivery.

HEAD OFFICES AND WORKS **SYDNEY, CAPE BRETON, CANADA**

Thor

THE WORLD'S
GREATEST AIR TOOLS

INDEPENDENT
PNEUMATIC TOOL COMPANY
CHICAGO NEW YORK

FOR SALE IN CANADA BY
H. W. PETRIE, LTD. { Toronto, Ont. / Montreal, Que. / Vancouver, B.C.

PISTON AIR DRILLS

ARE GUARANTEED 30% MORE EFFICIENT THAN ANY OTHER MAKE.

They have the *Corliss Valve Motion*, conceded by Engineers to be the greatest valve mechanism used in any air drill. Are equipped with *Telescopic Screw Feed*, allowing for the longest range in drilling. Are made in all capacities suitable for drilling, tapping, reaming, rolling flues, wood boring, stay-bolt work and close corner work.

Don't fail to give these machines a trial. Write for circular G and our proposition before placing your order.

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Steel Rails.
Wrought Iron Steel-Tyred Disc Wheels
Locomotive and Car Wheel Tyres.
Axles, Crank Pins, Forgings, Etc.

FOR STEAM AND ELECTRIC RAILWAYS.

OFFICE: Commercial Union Building, 232 ST. JAMES STREET, MONTREAL

Double Elliptic Street Car Spring with Cast Ends

RAILWAY SPRINGS

LOCOMOTIVE, TENDER AND PASSENGER CAR SPRINGS of every description.
EQUALIZING, DRAWBOARD, BUFFER AND SPIRAL SPRINGS of all kinds.
STREET RAILWAY SPRINGS, from the largest to the smallest.
TRACK TOOLS, RAIL BRACES, TIE PLATES, GUY ANCHORS AND RODS, LOCOMOTIVE SANDERS, CHAIN, Etc.

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American Electric Headlight

Economical in Steam
Positive Governors
Minimum of Parts

CHANGE

TAYLOR & ARNOLD, Limited

MONTREAL - - - WINNIPEG

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GRAND TRUNK ROUTE

"A Fresh Water Sea Voyage"

Between Sarnia, S. S. Marie, Port Arthur, Fort William and Duluth.

"That Georgian Bay Trip"

Between Parry Sound, Collingwood, Owen Sound, S. S. Marie, Mackinac Island, and Sarnia.

"Amongst the 3,000 Islands"

Between Penetang and Parry Sound.

Rates and full information from all Railway Agents or the Company at Sarnia, Ont., or Collingwood, Ont.

THE ALGOMA STEEL CO., LIMITED

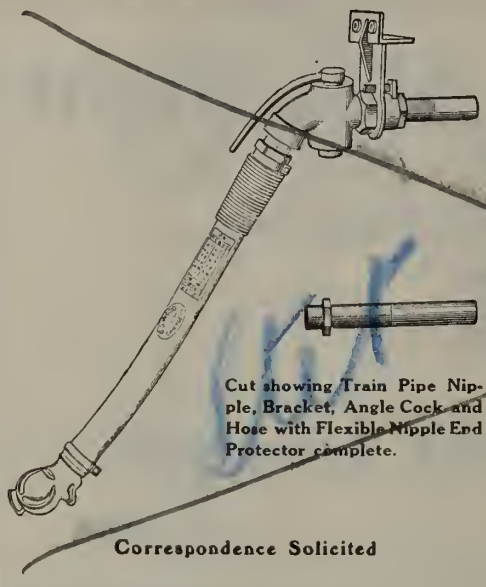
SAULT STE. MARIE, ONTARIO

IS NOW BOOKING ORDERS FOR **STEEL RAILS** FOR DELIVERY DURING THE SEASON OF 1912

Parties intending purchasing will find it to their interest to let us have their specifications at an early date so as to insure desired deliveries.

Office:
MARK FISHER BUILDING
MONTREAL

DRUMMOND, McCALL & CO.
GENERAL SALES AGENTS



Cut showing Train Pipe Nipple, Bracket, Angle Cock and Hose with Flexible Nipple End Protector complete.

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GUILFORD S. WOOD

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WOOD'S FLEXIBLE NIPPLE END PROTECTOR

FOR AIR-BRAKE AND SIGNAL HOSE

Prevents chafing and abrasion effecting a saving of from 40 to 50% in maintenance of air-brake hose.

THE MONOGRAM BRACKET

will absolutely stop shifting and leaking of air-brake train pipes. All M.C.B. requirements are obtained and maintained.

P. & W. HOSE PRESERVATIVE

FOR AIR-BRAKE AND PNEUMATIC TOOL HOSE

will prevent cracking of rubber cover and deterioration due to climatic changes. Easily applied.

Electric Headlight Saves Train

(From Daily Papers)

"Wednesday night B————forgot to deliver an order to hold Eastbound Passenger Train, No 6, and only the fact that the Electric Headlight of the oncoming Passenger train was seen at a great distance by the Engineer of the Westbound Freight prevented a head end collision in the————Canyon near————. The warning light was seen in time to enable the freight to get back on to the siding at————."

PYLE-NATIONAL ELECTRIC HEADLIGHT CO.

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Complete Switchboards

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Transformers, Switches, Circuit Breakers

ELECTRIC RAILWAY AND BATTERY BOARDS A SPECIALITY

House Service Type and Traction Meters

Canadian Representative

G. C. ROYCE, West Toronto, Ont.

Let us quote you on your requirements.

EDISON BSCO PRIMARY BATTERY

The ideal tower battery for a mechanical interlocking plant should be capable of maintaining a uniform voltage under constant discharge and of delivering comparatively high discharges without injury; their condition should be plainly indicated by the appearance of the cell; they should not be affected by slight variations in temperature and they should operate from one renewal period to the next with no expense for maintenance.

The Edison BSCO cells, we believe, possess these qualities more completely than any other type of Primary Battery. The uniformly good service that they can be depended on to furnish from the day set up until the full capacity is consumed, with no attention whatever, makes them the logical cells for this service.

One series of Edison BSCO cells will usually displace a two or three series gravity battery in towers where the ampere discharge is not high. For plants where the demand on the battery is heavy, the multiple series system of hooking up should be used, the number of series being governed by the current demand of each particular plant. In this way extremely long life can be obtained, and you enjoy a feeling of security, knowing that the all important requisite, viz., sufficient voltage to operate all functions without failure, is guarded by a battery of proven reliability—one that will not be affected by momentary heavy discharge, evaporation, buckeled plates, etc. And as time passes this feeling of security strengthens and you realize that whatever else goes wrong you have a battery that can be depended on to do its work day in and day out without failure.

Thomas A. Edison, Inc.
262 Lakeside Ave., Orange, N. J., U.S.A.

Steel Castings

One of the two largest steel castings ever made in Canada was cast by us. They were Y-pipe connections for a 10,500 H.P. water wheel. We made it for the John McDougall Caledonian Iron Works, and they were thoroughly satisfied.

Absolute Satisfaction is Guaranteed

JOLIETTE STEEL AND IRON FOUNDRY CO., LTD.

Office and Foundry, JOLIETTE, P.Q.

Besly Grinder Reduces Cost of Locomotive Repairs

H. W. Petrie, Limited, Toronto, Agents.

Williams & Wilson, Montreal, Agents.

No. 14 [illegible] in.—G. Besly Grinder with Ring Wheel Chuck.

For Flat Surfacing, Keys, Brasses, Link Blocks, Nuts, Bolt Heads, etc.
Write for catalogue—NOW.

CHARLES H. BESLY & COMPANY
CHICAGO, U. S. A.

Ferranti
TRACTION METERS

The demand for Car Meters has grown very rapidly and the economies effected by the installation of these instruments have more than justified their use.

The guaranteed accuracy of the Ferranti Traction Meter is 2½ per cent. from full load to 1-10th load.

Will stand 100 per cent. overload for ten minutes.

Interesting data and attractive prices furnished on application to

Canadian Representative

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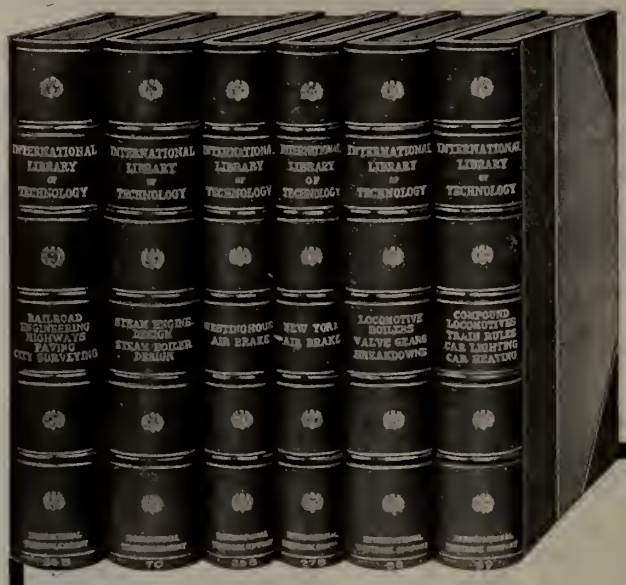
West Toronto, Ont.



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Boilers - Horizontal Tubular
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Tanks - Iron or Steel of all Kinds.
Air Reservoirs.
Wooden Tanks with Steel Superstructures.

We make a specialty of welded Tanks, without rivets or seams.

Structural Steel
Hand Power Cranes
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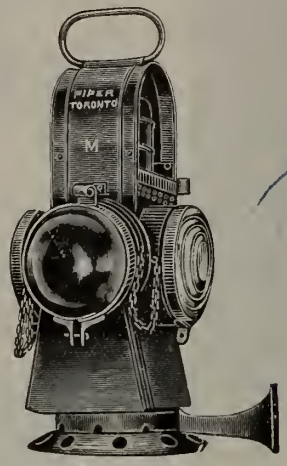

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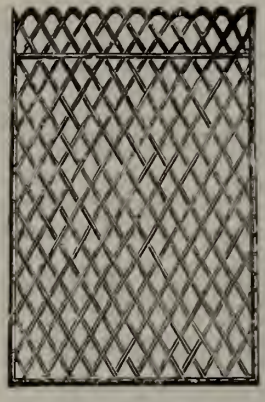

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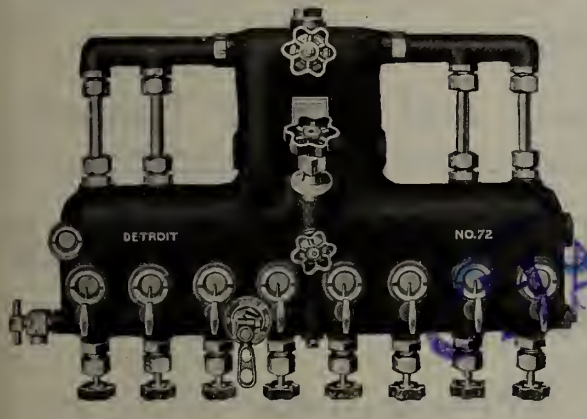

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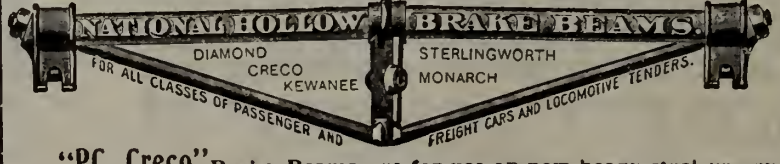

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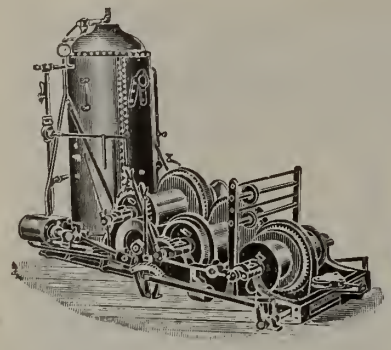

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Fuse Batteries
Curtis's & Harvey (Canada) Ltd.Montreal
Fuse Detonators
Curtis's & Harvey (Canada) Ltd.Montreal
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Curtis's & Harvey (Canada) Ltd.Montreal
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The Holden Co., Ltd. .....Montreal
McCord & Co. .....Chicago, Ill.
Gates, Crossing
The N. L. Piper Ry. Supply Co...Toronto
Gauge Cocks
Ohio Brass Co. .....Mansfield, Ohio
Gauges, Locomotive
Taylor & Arnold .....Montreal
Gauges, Water
Detroit Lubricator Co. ....Detroit, Mich.
Ohio Brass Co. .....Mansfield, Ohio
Gears
American Vanadium Co. ..Pittsburgh, Pa.
Titanium Alloy Mfg. Co. .....Montreal
Gears, Machine Cut
Corbett Foundry Co. Ld.Owen Sound, Ont.
Generators, Electric
Canadian Gen. Elec. Co., Ltd.....Toronto
Northern Electric & Mfg. Co....Montreal
Grates, Shaking
Babcock & Wilcox .....Montreal
Poison Iron Works, Ltd. .....Toronto
Grinders, Disc, for Wood and Metal
C. H. Besly Co. .....Chicago, Ill.
Groceries
The Hudson's Bay Co. .....
Hammers, Cast Steel
Am. Brake Shoe & Fdry Co.Mahwah, N.J.
James Smart Mfg. Co. ...Brockville, Ont.
Handcars
Canadian Fairbanks-Morse Co...Montreal
Crossen Car Mfg. Co. .....Cobourg, Ont.
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The Hudson's Bay Co. .....
Rice Lewis & Son .....Toronto
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Pyle National Elec. Headlight Co..Chicago
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Headlinings
Crossen Car Mfg. Co. .....Cobourg, Ont.
Heaters, Feedwater
Robb Engineering Co., Ltd.Amherst, N.S.
Heating, Car
Canadian Gold Car H'g & L'g Co..Montreal
Consolidated Car Htg. Co....Albany, N.Y.
Safety Car Heating & L'g Co...New York
United States Light & Heat Co.New York
Heating Plants, Steam
National Boiler Washing Co. ....Montreal
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National Boiler Washing Co. ....Montreal
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Taylor & Arnold .....Montreal
Hooks
Steel Co. of Canada, Ltd..Hamilton, Ont.
Hoppers, Car, Wet or Dry
Duner Co. .....Chicago, Ill.
Hose, Air Brake and Steam
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Guilford S. Wood .....Chicago, Ill.
Hydrants
Canada Foundry Co., Ltd. .....Toronto
Canadian Fairbanks-Morse Co...Montreal
Kerr Engine Co. .....Walkerville, Ont.
Hydraulic Equipment
R. D. Wood & Co. .....Philadelphia, Pa.
Illustrations
Acton Burrows, Limited .....Toronto
Injectors
T. McAvity & Sons .....St. John, N.B.
Inspections
R. W. Hunt & Co. .....Montreal
Insulators, Porcelain
Canadian Gen. Elec. Co., Ltd.....Toronto
Ohio Brass Co. .....Mansfield, Ohio
Insurance, Accident
Canadian Ry. Accident Ins. Co...Ottawa
Imp. Guarantee & Acc. Ins. Co..Toronto
Interlocking Plant and Signals
Canadian Steel Foundries, Ltd...Montreal
Railway Signal Co. of Can., Ld..Montreal
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International Marine Signal Co. ...Ottawa
Montreal Locomotive Works .....Montreal
Locomotives, Contractors'
Dominion Equip. & Supply Co..Winnipeg
Locomotives, Electric
Baldwin Locomotive Works..Philadelphia
Canadian Gen. Elec. Co., Ltd. ....Toronto
Montreal Locomotive Works .....Montreal
Locomotives, Logging
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Locomotives, Rack
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Canadian Locomotive Co...Kingston, Ont.
Montreal Locomotive Works .....Montreal
Locomotives, Steam
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Canadian Fairbanks-Morse Co...Montreal
Canadian Locomotive Co...Kingston, Ont.
J. T. Gardner .....Chicago, Ill.
Montreal Locomotive Works .....Montreal
Vulcan Iron Works .....Wilkesbarre, Pa.
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Brown Hoisting Machinery Co..Cleveland
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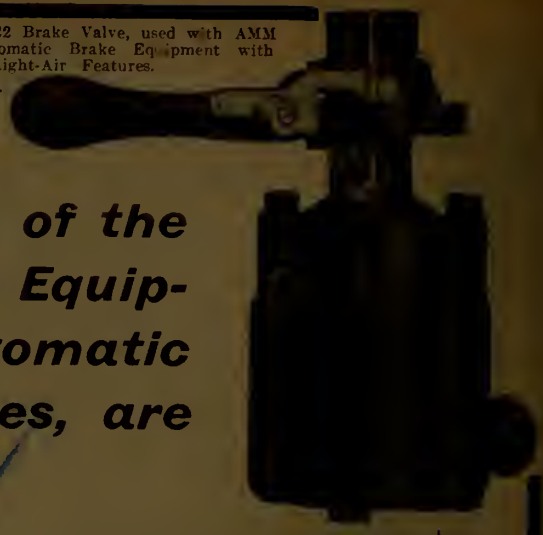

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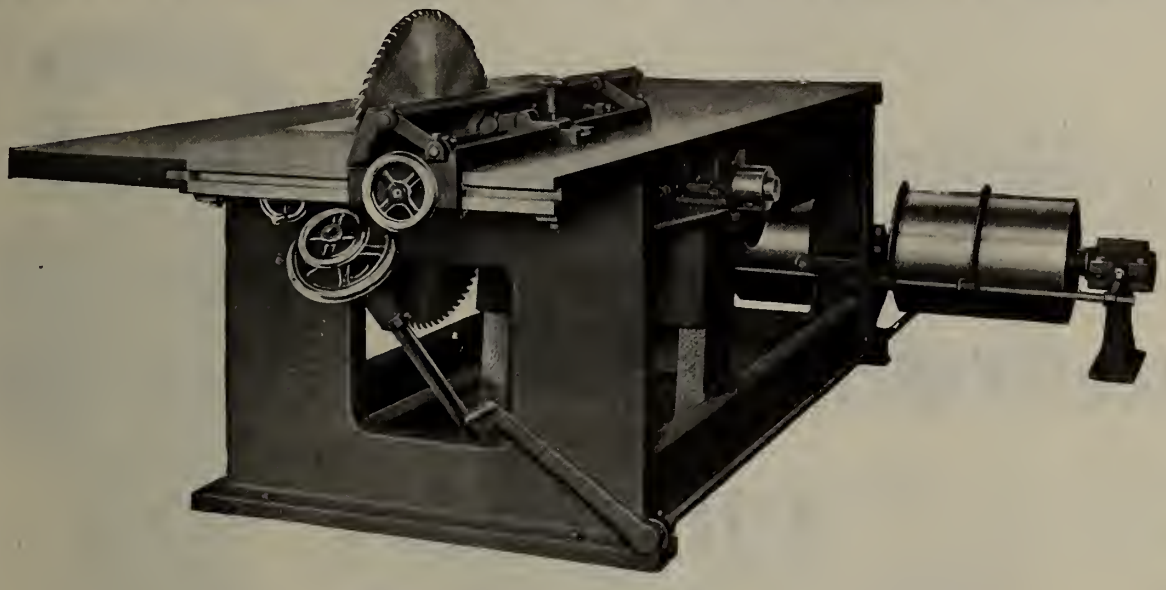

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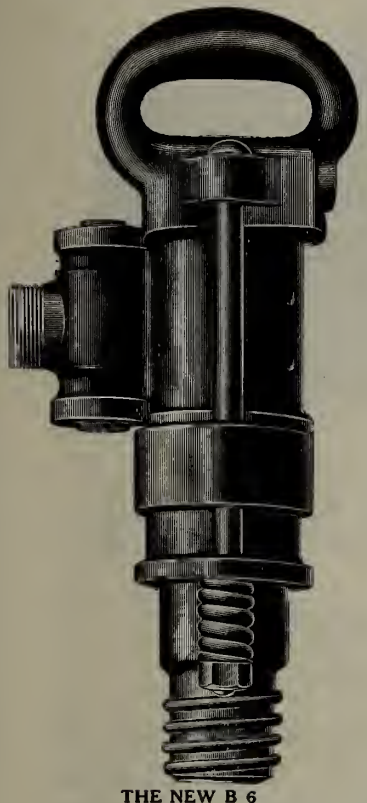

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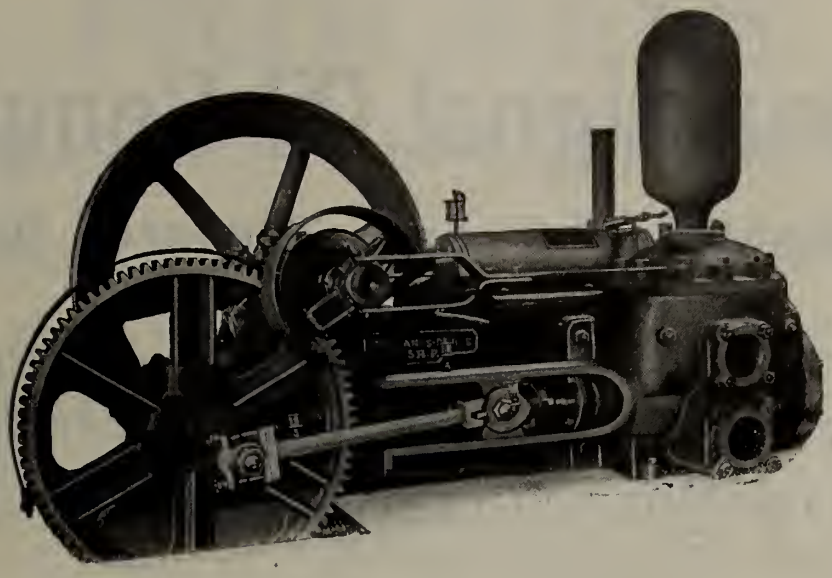

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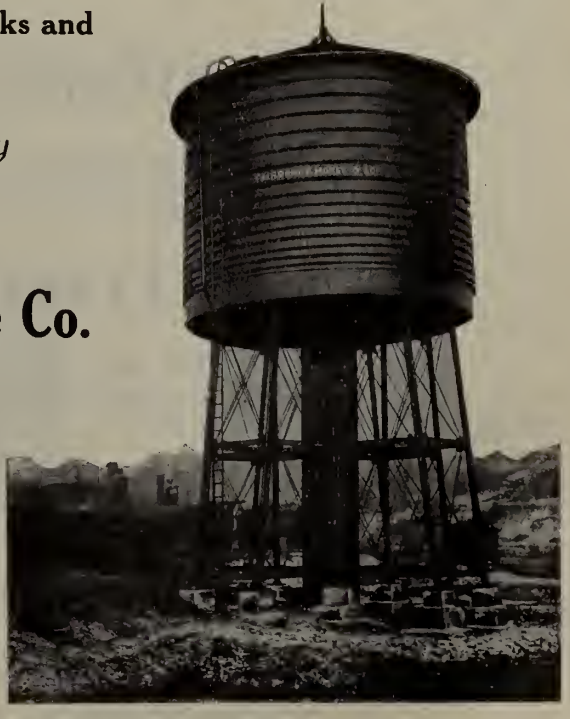
Combined Gasoline Engine and Pump

Our Water Station Equipment will reduce your expenses, such as attendance, maintenance and fuel cost to a minimum. A great advantage in this system, whether for railroads water station or for town waterworks, is the little attendance necessary. A section foreman or a station agent can look over the engine and start it before taking up his other duties.

We contract for complete erection of these tanks and the furnishing of pumping machinery.



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Franklin, Pa., and Toronto, Ont.

Sole manufacturers of the celebrated GALENA COACH, ENGINE and CAR OILS, and SIBLEY'S PERFECTION VALVE and SIGNAL OILS.

GUARANTEE COST per thousand miles for from one to five years, when conditions warrant it.

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Galena Railway Safety Oil "B"

in Marker and Classification Lamps, to secure Efficiency of Service, Maximum Candle Power, Clearness of Light.

Galena Long Time Burner Oil

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LUBRICANTS THAT KILL HEAT

JOURNOLENE for the Journals of Railroad Cars, Street Cars, Pulp and Paper Mills, Foundries, Steamships and all Machinery of Heavy Duty.

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SPEDOLENE for Motor Cars and Trucks. Mixed Ready for use.

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Its growth in favor is spontaneous because it saves operating costs.

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50 per cent. LESS WEAR ON METAL PARTS.

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Tested and Approved by Steam and Electrical Railroads.
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Sole Manufacturers

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Titanium Steel Rails

Possess Unusual Durability

It has been proved beyond the shadow of a doubt that Titanium Alloy makes much better open hearth and Bessemer steel, and, therefore, when properly made, must result in stronger, safer and more durable rails.

The increased resistance to shock and abrasion resulting from the greater purity and ductility of the Titanium steel not only makes the rail less susceptible to heat and cold, expansion or contraction and consequent breakage, but it permits a substantial increase in the percentage of carbon by preventing the brittleness otherwise induced by the higher carbon content.

The Boston Elevated has just found that Titanium Open-Hearth rails are 41 per cent. more durable than the plain Open-Hearth. Many other roads report higher percentages.

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the well known author of "The Metallurgy of Steel," says:

"Titanium * * * has a stronger affinity for oxygen than have the other well known deoxidizers; * * * it probably gives the slag such a consistency that it separates more completely from the molten iron."

TITANIUM

The Wonder-Working Alloy

prevents defects in rails

for the simple reason that it effectively removes slag and gases that cause defects. It leaves the metal clean and pure—ready to make sound, healthy rails that you can depend on absolutely. Their extra cost is only about $2 per ton.

Write for Booklet No. 30, giving detailed facts and diagrams which prove conclusively that Titanium Rails safeguard your passengers and your profits.

READ THIS!

A prominent Rail Maker Says:

"I have treated during the past two years in the neighborhood of 3,000 tons of steel rails with small percentages of ferro-titanium, proportioned to, and with the result of eliminating, the 0.25 to 0.30 per cent. oxide of iron and slag which has been found in such rails prior to such treatment: also the included gases and also slag, the resulting products being practically free from all impurities."

Output of Titanium Steel in 1910—326,300 gross tons. The 1911 output was 410,600 gross tons.

Titanium Alloy is made for Canadian consumption by Electro Metals, Ltd., Welland, Ont.

TITANIUM ALLOY MANUFACTURING COMPANY

Manufactured in Canada under Rossi Patents

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The Steel of Ultimate Quality

Elasticity Strength Toughness Endurance

Heat Treated Vanadium Steel Locomotive Main Side Rod--
Bent Cold Under Drop Test without Fracture

Elastic Limit	70,000 lbs.
Ultimate Tensile Strength	90,000 "
Elongation in 2"	20%
Reduction	50%

Vanadium is the only element that greatly increases the elastic limit and dynamic strength of steel without impairing its ductility.

OVER 2,000 VANADIUM STEEL CONNECTING RODS IN SERVICE

in the fastest passenger, and heaviest freight locomotives

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The Statement of a Railroad Storekeeper

Cut 528

Here is a report made by Mr. J. P. Murphy, General Storekeeper for the L.S. & M.S.R.R.:—

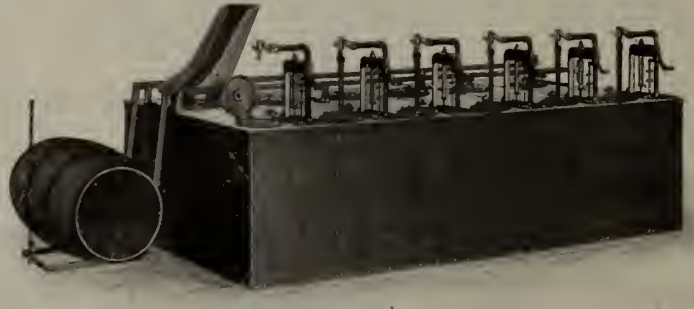
"In the handling of oils the Bowser System is being used extensively, and with it, at every engine house where it has been installed, we have been able to DECREASE *our forces* TWO MEN, *one night and one day, as it has been entirely possible to have the supply man deliver the oils in addition to his other duties. The pumps are located so the oils and supplies are delivered over the same counter."*

The above is copied verbatim from his report to the convention. This shows the economy of the Bowser System under actual working conditions.

Why can't you save the labor of *two men* and maintain absolute accuracy in your oil department?

Marine Oil Storage

There is no place where more scrupulous care should be used than on steam ships, etc., not alone for the sake of cleanliness and economy, but a dirty engine-room is always a constant fire hazard.



Battery of Cut 64'S

The Bowser System has been especially designed for marine use. When desired the pumps are trimmed in polished brass to harmonize with the fittings in the engine-room.

Why not get our literature on this matter and see just how much improvement can be made in handling your oil? Ask for catalogue No. 18.

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For twenty-seven years manufacturers of self-measuring oil pumps and tanks, gasoline and oil storage systems, self-registering pipe line measures, oil filtration and circulating systems, etc.

LINE MATERIAL

For Every Class of Service

Pole Brackets and Fittings
Suspensions of all types
Soldered, Clinch and Mechanical Ears
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Designed to **meet** the most Severe Service. Made of the **Best Materials** and subject to **Thorough Factory Inspection**

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Bolts, Nuts and Washers **Guy Anchors** **Galvanized Strand**
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of Railway Signalling and Train Despatching

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THIS system combines all the features of Telephone Train Despatching with Remote Control Block Signals. A permanent record in the despatcher's office is automatic and continuously made and shows the exact position of trains at all times.

All signals from the despatcher are made direct to train crew (without any intermediary).

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OXYACETYLENE and all systems of WELDING and CUTTING PLANTS.

For welding steel, cast iron, copper, brass, lead, aluminum. For cutting steel and wrought iron. It helps you to KEEP YOUR SCRAP HEAP CORNER EMPTY.

Have your broken castings repaired. Do not lose time waiting for new castings. They can be repaired by welding the cracks and broken parts by the autogenous welding process and made as good as new.

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The "Railway Greyhound of Canada," the finest and fastest train in the Dominion, runs every day in the year between Montreal and Chicago.

The Lines of this Great System reach all the Principal Cities and Towns in Quebec and Ontario

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Steel Steamers, full Canal Size
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Marine Engines and Boilers—all Sizes

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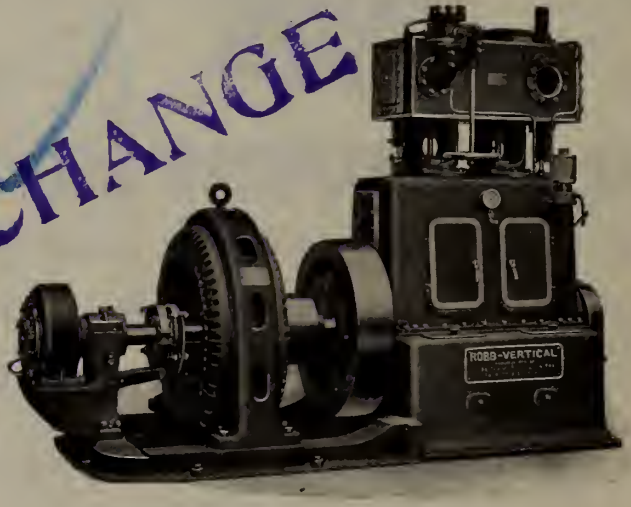

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EFFICIENCY The steel reinforcement is solidly embedded in the cast iron, being cor[illegible] with inward curve, and setting vertically. This strengthens and holds the shoe intact, permitting wear to wafer thinness without breakage.

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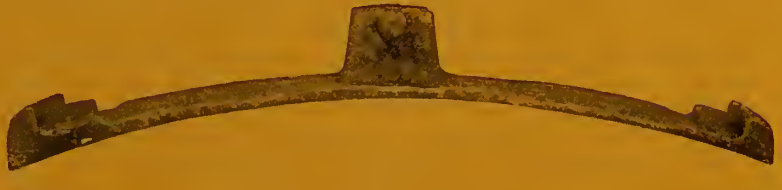

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has been proved by the use of Continuous, Weber and Wolhaupter base-supported rail joints—after fifteen (15) years' service, having a record of over **50,000 miles in use**—the extent of which is evidence of their excellence. Made in Canada.

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Over 50,000 miles in use.

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Rolled from Best Quality Steel.

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The best way to Oshawa, Bowmanville, Orono Port Hope, Cobourg, Trenton & Picton

Through fares include bus fare and hand baggage transfer to Oshawa Town and Bowmanville Town.

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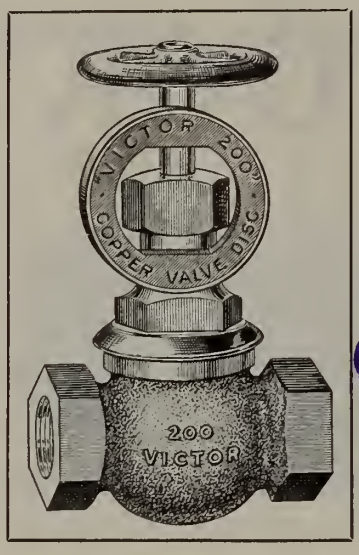

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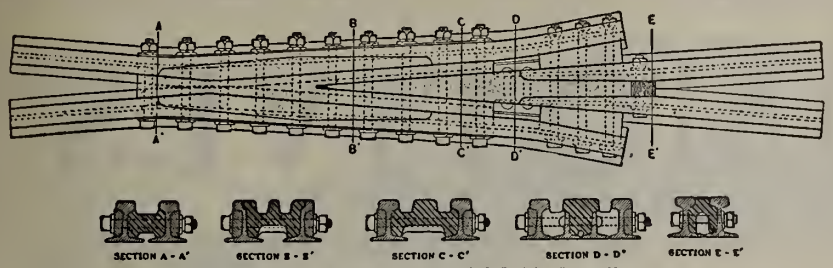

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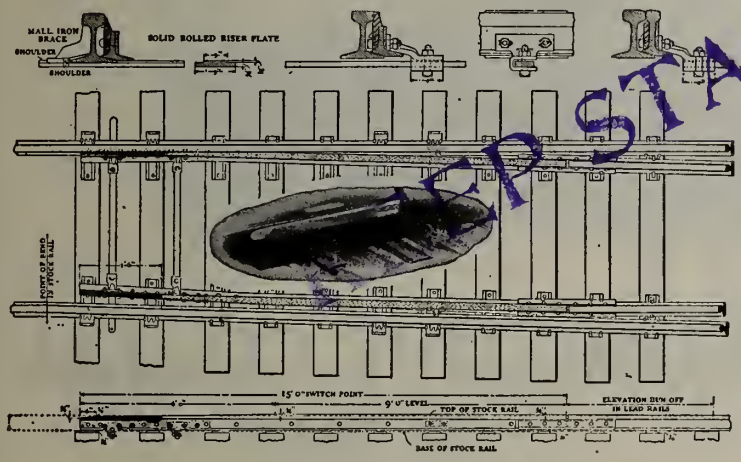
A Manganese built-up Frog and Switch which are giving fine service.



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Safety Switches, Frogs, Crossings, General Railroad Track Equipment

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SIMPLE and COMPOUND adapted to every variety of service

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The train leaves as follows:

Leave North Parkdale	9.15 p.m.	Arrive Ottawa,	6.50 a.m.
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Arrive North Toronto	9.40 p.m.	Daily.	
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Electric Lighted Compartment Cars and Standard Sleepers for both points.

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¶ The roadbed has been improved till it is unexcelled in Canada.

¶ The equipment is "Canadian Pacific Standard," a synonym for the "best" and attentive porters, ensure efficient service.

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Special Steel--Special Methods and Long Years of Experience

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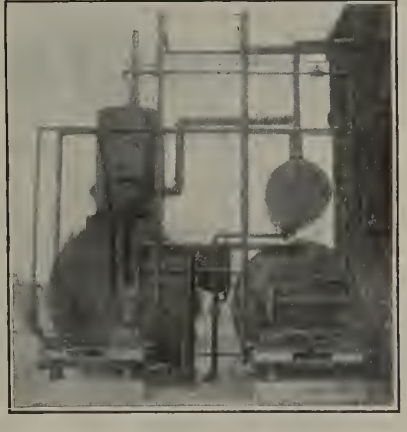
We are installers of the latest and most up-to-date Automatic Boiler Washing Plants for Railroad use.



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We are installers of all classes of heating systems in Roundhouses, Machine Shops and Industrial Plants.

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This plant handles from Twenty-four to Twenty-eight Locomotives per day.

THE GREATEST SAVER AND DIVIDEND PAYER TO THE RAILROADS.

Submit your requirements fully. It will result in your entire satisfaction.

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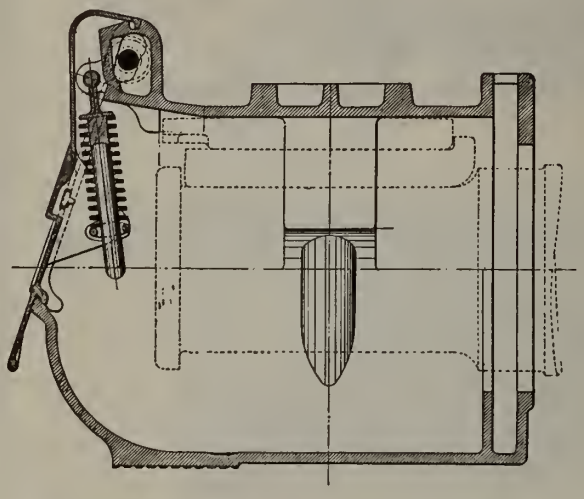

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McCORD & COMPANY
People's Gas Building, Chicago

THE HOLDEN CO., Limited
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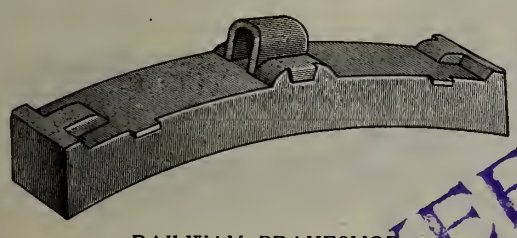

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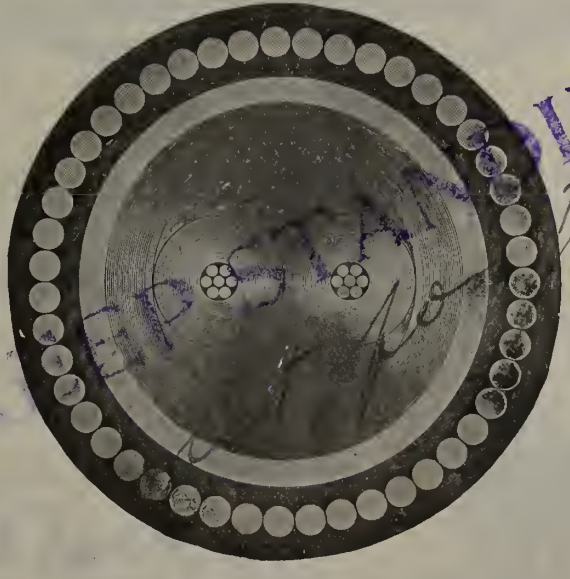

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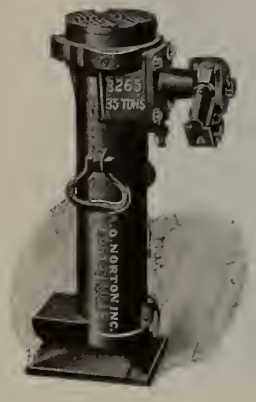

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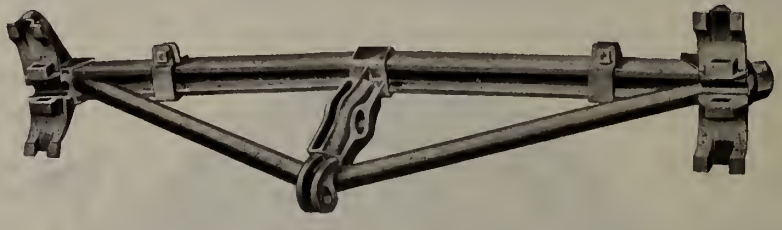

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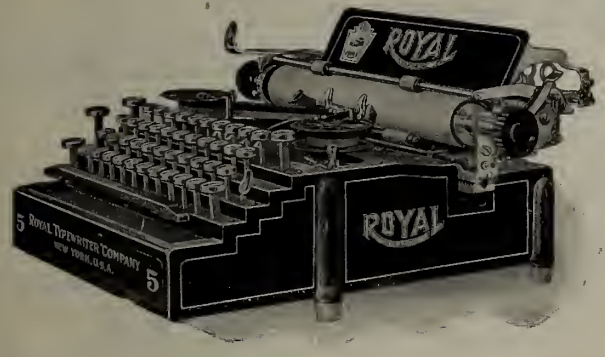

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The Railway and Marine World

June, 1912.

The Construction of the Algoma Central and Hudson Bay Railway.

By R. S. McCormick, M. Am. Soc. C.E., Chief Engineer.

The construction of the Algoma Central and Hudson Bay Railway was originally begun in the spring of 1900 by the old Lake Superior Corporation, under the management of F. H. Clergue, and a land grant and subsidy was granted at that time by the Dominion Parliament.

Construction was carried on until the spring of 1903, at which time there was graded a continuous line from Sault Ste. Marie, Ont., to a connection at Josephine Jct., 170½ miles north, with a line extending down to Lake Superior, at Michipicoten Harbor. This section, 20 miles long, was built in 1899-1900 to gain access to valuable iron mines in this territory, owned by the corporation. The grading on the main line was not completely finished, however, as financial misfortunes overtook the corporation and truck was only laid to about 55 miles north of Sault Ste. Marie. A large number of bridges and trestles between this point and Josephine Jct. were also not built but otherwise the line was completed to sub-grade. Between 1903 and 1908 additional track was laid to carry the end of steel to mile 68, but no other work was done north of this point.

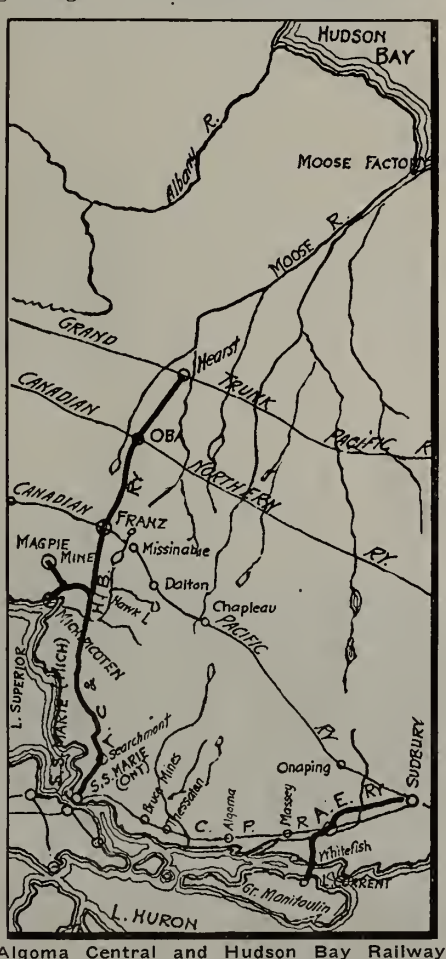
In 1909 active measures were begun to complete the A.C. and H.B.R. by an English syndicate, which had, in the meantime, secured control of the Lake Superior Corporation, including the Algoma Steel Co., the railways and other transportation and industrial interests, at Sault Ste. Marie. Before undertaking the completion and proposed extension of the railway, a report was made for the management on the whole project by F. H. McGuigan, of Toronto, formerly of the G.T.R. He reported favorably on the completion of the line and on its extension to connect with the National Transcontinental Ry.

The necessary financial arrangements being successfully completed, the first work undertaken was the locating of a line to connect the old grade near Hawk Lake with the C.P.R. This was accomplished by the location and construction of 30 miles of line from Hawk Lake Jct. to Hobon on the C.P.R. S. Keemle, Toronto, was in charge of the locating party on this work. A 0.6% compensated 6° maximum curve line was secured at a cost of about $38,000 a mile complete, including track and structures. In May, 1910, a contract was let to the O'Boyle Bros. Construction Co., of Sault Ste. Marie, Ont., for this section, and on July 1, 1910, another contract was let to the same contractors for the completion of the main line from mile 68 to Josephine Jct., mile 170½, including regrading at points where cuttings had slid in, bringing up settled embankments, all the bridging (excepting Montreal River), track laying and ballasting.

In the meantime a spur line of 9½ miles was located from a point 17 miles from Michipicoten Harbor on the line extending from the lake to the mines, northerly, to a new Magpie iron mine. This construction, including track laying, and the ballasting, was also let to the O'Boyle Bros. Construction Co., and in May, 1910 active work was started on this section.

The railway company also started work to repair and re-tie that section of the 20 miles extending from Michipicoten Harbor to Josephine Jct. known as the Josephine branch, being the upper 10 miles of the line which had been wholly unused for over eight years, and which was in wretched shape, as the ties were rotten, and very little ballast having originally been put on when first constructed it was necessary to reballast the whole section. The railway company did this work with its own forces with some help from the O'Boyle

From May, 1910, to Aug., 1911, the work on the main line, north from mile 68 and south from Josephine Jct., the grading of the Hawk Lake-Hobon sec-



Algoma Central and Hudson Bay Railway and Algoma Eastern Railway.

tion, the building of the Magpie branch and the rebuilding of the ten miles of the Josephine branch, proceeded with the usual ups and downs peculiar to railway construction work in such a country. Poor labor, generally a lack of same, bush fires, whiskey and all the troubles incident thereto, known only to the experienced, were faced and fought.

By Aug. 1, 1911, the Magpie branch was completed, at a cost of practically $275,000. The line was built on a 1.5% compensated grade against the traffic and 2.5% flat, with the traffic. The first 4½ miles to the crossing of the Magpie River was light work, except for some heavy side cutting descending the slope to cross the river, at which point the adverse grade of 1.5% compensated was located. From the river crossing, however, to the mine the line is heavy, and at mile 7½ there is a timber trestle 900 ft. long, 80 ft. high, on a 12° curve and a 1.75 grade. Up to this point the grade is 2% maximum, from here to the mine site it is 2½%, 12° being the maximum curve. Very large expenditures are being made by the company in opening the mine, and in addition to a plant for treating the siderite ore, a model mining town is being built. This branch is laid with 80 lbs. A.S.C.E. rail with Seller's shoulder tie plates on all curves and is most substantially built in all respects, excepting that timber and piles were used in bridging.

On July 15, 1911, the sub-contractors on the Hawk Lake-Hobon section finished the grading. Murdock Bros. had the lower 19 miles, and Cavicchi and Pegano the upper 11 miles. The work was quite heavy, the grading quantities being 732,933 cu. yds.; classified 261,269 cu. yds. solid rock; 94,378 cu. yds. loose rock, and 377,286 cu. yds. common excavation. In addition there was 20,178 cu. yds. over break in rock cuttings. About 3,000,000 ft. b.m. of bridge timber and 40,000 lin. ft. of piling was also used on this work. Other items of grading, etc., included 1,500,000 cu. yds. overhaul, 170,000 ft. b.m. culvert timber, 220,000 lbs. bridge iron, 291 cu. yds. dry stone masonry, 423 cu. yds. cement masonry and other small items. The rock work was exceptionally well done, as the specifications only allowed common excavation for over break and all the time the work was in progress this was enforced. On final estimate, however, a fair amount of over break was given as solid rock. Track laying and some ballasting was done this year and the bridge work was completed. On Jan. 10, 1912, track was connected up, giving railway connection from the C.P.R. into the mines of the Michipicoten district. Some ballasting was also done this year.

Work on the main line completion progressed slowly from June, 1910, to May, 1911, at which time track had reached the Montreal River, mile 91½ north of Sault Ste. Marie. Here a steel viaduct 1,550 ft. long and 130 ft. high, situated at the head of a falls 150 ft. high, had to be built. This viaduct was designed in 1902 by Boller and Hodge, of New York city, and a contract was arranged at that time with the Canadian Bridge Co. for its erection. Due to the suspension of this work the contract was never carried out, and upon taking up the work to complete same the writer awarded another contract to the Canadian Bridge Co. There is 1,745 tons of steel in this viaduct, and the alignment being on a curve at each end it was a very interesting job of erection. The viaduct consists of tower girders supported on steel legs, with concrete pedestal piers with end abutments. There are thirteen 30-ft. tower girders and one 40 ft. situated on an island in the middle

of the river. The intermediate girders consist of one 85 ft., five 75 ft., ten 60 ft., and two 30 ft. spans. The structure is designed under the Dominion Government specifications, class 1 loading, and is a splendid piece of work. Due to

A.C. and H.B. Ry. Erection of Viaduct at Montreal River.

some poor work in concreting the piers and having to re-build some, the erection was slow. However, track was laid over this viaduct and track laying proceeded north of it in Oct., 1911.

At the date of writing track is at mile 104½. At the north end track laying has progressed to mile 117 to date, leaving a gap of 12½ miles, which, it is expected, will be finished by the middle of June. The principal reason for the slow progress made in track laying is on account of the excessive amount of bridging and trestling on this line.

A.C. and H.B. Ry. Montreal River Viaduct and Yard.

Between Sault Ste. Marie and Josephine Jct. there are about 16,000,000 ft. b.m. of bridge timber in 140 structures, besides 100,000 lin. ft. piling. Some of these bridges are very large, and as all the bridge timber used, excepting a few thousand feet cut in the country, is British Columbia fir, it is necessary to build these bridges from end of steel. The old line from Sault Ste. Marie to Hawk Lake Jct. is through a most difficult country to build in, and the location secured, while good work on the whole, shows it. The line to Hawk Lake Jct., with the new extension, and on to Michipicoten is badly handicapped with heavy grades and sharp curvature, 1½% uncompensated grades and 12° maximum curves. To improve this, grade and alignment would require extensive re-locating, hence, for the present, this is not contemplated. The route is very picturesque and travellers have a treat in rugged scenery awaiting them on the opening up of the Algoma Central for traffic, north of Sault Ste. Marie.

While the above work was progressing south of the C.P.R. main transcontinental line a location was made north to the National Transcontinental Ry. at the new town of Hearst (or Grant) the first division point west of Cochrane and 101 miles north of the C.P.R. This location is on the same grades and curvature as the Hawk Lake-Hobon section, viz.. 6.6% compensated grade and 6° maximum curves. Louis Whitman, locating engineer, had charge of the location, with Sanford Hazelwood and W. H. Wilkie in charge of the parties. The route traversed by this line is through rough country for 30 miles north of the C.P.R., north of this the line enters the great clay belt of Northern Ontario and the grading is light. The south 30 miles, however, brings up the average cost of this line to about $30,000 a mile, including track and structures.

The crossing of the C.P.R. and the Canadian Northern Ontario Ry. (under construction) is made at grade. There are very few bridges on this 100 miles, and none at all of any size excepting some bay crossing of Oba Lake, where four pile trestles are driven, one of them being 1,302 ft. long with deck 10 ft. above the water. The balance of the bridging consists of pile structures, the largest, the crossing of the Mattawishquia river, near Hearst, at the junction with the National Transcontinental Ry., being 700 ft. long.

The grading quantities on this 100 miles will be, approximately 360,000 cu. yds. solid rock; 250,000 cu. yds. loose rock; 1,500,000 common excavation, and 3,500,000 cu. yds. overhaul. There will be about 80,000 lin. ft. piling and 1,500,000 ft. b.m. bridge timber, besides other lesser items. Corrugated ingot iron pipe is used in culverts, no concrete at all, and a few native timber culverts. In Aug., 1911, a contract was let the Superior Construction Co. for the construction of the section complete, including grading, bridging, track laying and ballasting. To date 60% of the grading is completed, and it is expected track laying will be started about June 15 at

A.C. and H.B. Ry. Viaduct and Falls of Montreal River.

Hobon and reach the C.N.O.R. crossing in October, thus placing the A.C. and H.B. Ry. in a position to deliver construction material and supplies to the contractors for this line at Oba.

Explorations for further extensions of the A.C. and H.B. Ry. to the north of the National Transcontinental Ry. have been made. A copper metallic circuit telephone line has been constructed from Sault Ste. Marie, through to Michipicoten Harbor and extensions to the mines and north to Hobon and Hearst (Grant) will be made this summer.

At Sault Ste. Marie, new terminals, consisting of a modern locomotive house, machine shops, stores and office building and a new terminal station and office building are all contracted for and the work started. This work involves the expenditure of about $500,000, and includes an extension of the main line to reach nearer the centre of the city of Sault Ste. Marie, and a new yard at Tagoma, the industrial centre, where extensive alterations and additions to the terminal facilities are being made. The company will also build a large coal and ore dock at Michipicoten Harbor, in the near future.

The above work has all been in charge of the writer, as Chief Engineer, since the beginning, with a staff of division and resident engineers. G. F. Horsey and C. Le B. Miles have charge of the work at the north end, and L. C. Maxwell and J. A. Hedgecock at the south end as division engineers. W. C. Franz is General Manager and G. A. Montgomery, Superintendent of the A.C. and H.B. Ry., as also of the Algoma Eastern Ry.

Driving Wheel Speeds.—A simple method of determining driving wheel speeds is given by the Baldwin Locomotive Works, as follows: To obtain revolutions per mile, divide 1,680 by the diameter of the driving wheel in feet; to obtain revolutions per minute, multiply the speed in miles per hour by 28, and divide the product by the diameter of the driver in feet.

The Construction of the Algoma Eastern Railway.

By R. S. McCormick, M. Am. Soc.C.E., Chief Engineer

The original charter for this railway, of 855 miles, now being completed from Sudbury to Little Current on Manitoulin Island, Ont., was obtained by F. H. Clergue at about the same time as the Algoma Central and Hudson Bay Ry. project was launched, a land grant and subsidy accompanied the granting of the charter.

A.C. and H.B. Ry. Trestle at Mileage 104.9 from Sault Ste. Marie.

Actual construction of this line was delayed from year to year, after the first section of 13 miles, extending from Sudbury to Gertrude Mine, was constructed in 1900-1901. An extension of ten miles from Gertrude Mine to Crean Hill was built in 1909, carrying the end of steel 23 miles west of Sudbury, where connection was made with a spur track connecting with the C.P.R. at Victoria Mine station. This spur, three miles long, is owned by the Canadian Copper Co. and connects the Crean Hill mine with the C.P.R. This 23 miles of line passes through the richest nickel district in the world, the famous Sudbury district and practically the entire revenue derived from its operation is for handling the ore from the Creighton and Crean Hill mines to the Canadian Copper Co.'s roasting yards at Copper Cliff.

In 1909-1910 surveys were undertaken to locate a line extending this railway to Little Current, on Manitoulin Island. A party, in charge of Louis Whitman, locating engineer, was started at Little Current on a route over which the writer had run a line for the old Sault Company in 1900. This line traversed the islands, and along the shore of the north channel to the mainland at the mouth of the Whitefish river, where it cut through a range of high rock hills facing the lake, thence to a connection with the C.P.R. at Espanola, on the Spanish River. A short section of 1½ miles of this original surveyed line was built in 1901, connecting the Spanish River Pulp and Paper Co.'s plant on the Spanish River with the C.P.R. Sault Ste. Marie branch. This little section or spur was built by the Sault Company and turned over to the C.P.R. to operate, under an agreement contemplating the ultimate completion of the whole project.

When the writer took charge of the work, a location was pushed through to connect with the Sudbury end at Crean Hill, 62 miles from Little Current. A maximum 1.25% compensated grade and a maximum 11° curve (with a 12° curve near Whitefish) was secured at a cost of about $32,000 a mile complete, including track ballast and buildings. In July, 1910, a contract was let to the O'Boyle Bros. Construction Co., of Sault Ste. Marie, Ont., for the construction of the 20 mile section from Little Current to the main shore at Whitefish, and in March, 1911, another contract was let to the Superior Construction Co. for the balance of the work from Whitefish to Crean Hill, 42 miles. The grading work on this 62 miles is practically complete and track laying was recently started at Espanola. The 62 miles of track will be laid and ballasted about Oct. 30 next.

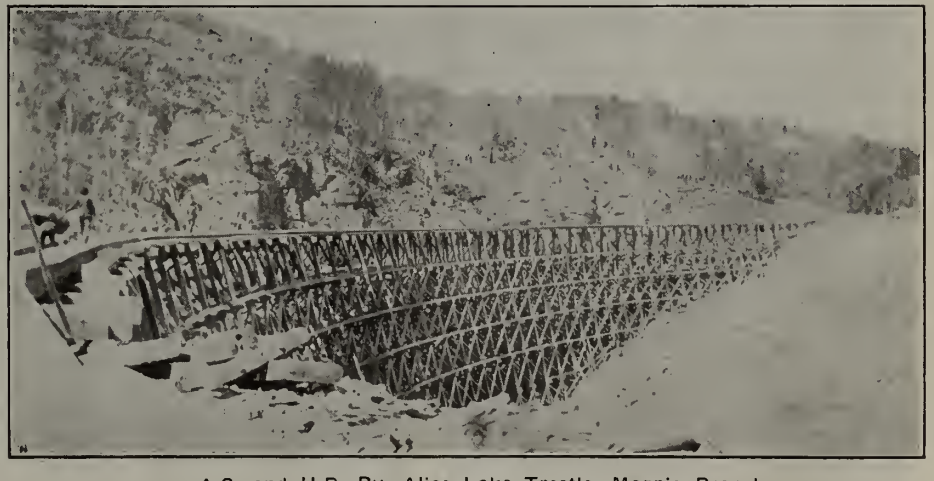
The country traversed by this railway is almost wholly unsettled and south of Espanola is very rugged. From the Whitefish river to Little Current the scenery is most picturesque, as the line follows close to the water and winds around the headlands and bays of the section of the north channel known as the Bay of Islands. The grading on this section, while practically all solid rock, was not excessive in cost, averaging about $20,000 a mile, including bridging. From Espanola easterly to the junction with the old line at Crean Hill the line passes over a better country, but, from an agricultural point of view, of little value.

An under crossing of the C.P.R. Sault Ste. Marie branch is obtained near the village of Nairn Centre, where the Algoma Eastern Ry. passes under the C.P.R. embankment, the tracks of the latter company being carried over on a 27 ft. 7 ins. skewed deck plate girder span on concrete wing abutments.

The bridging on the entire line from Sudbury to Little Current is light for such a country. The steel structures consist of one 105 ft. and one 60 ft. deck plate girder spans on stone abutments and centre pier at the Vermillion river crossing, 17 miles west of Sudbury; one 180 ft. through rivetted truss span at the Spanish river crossing, mile 42; one 176 through rivetted truss at the second crossing of the Spanish river at Espanola (built in 1901) and two 100 ft. girder spans at two other points, together with a 36 ft. deck girder span on concrete at an overhead crossing of the Government trunk road near Espanola. These major structures are supplemented by a number of timber trestles and pile bridges. At Little Current, in order to cross the channel in front of the town, through which there is considerable vessel traffic, a bridge, some 600 ft. long, is required with a draw span. This will be erected this year.

The traffic expected for this railway consists of ore, pulp and paper, coal and the products of Manitoulin Island, which, previous to the construction of this line, was entirely dependent on water communication with the mainland. This island is 90 miles long, averaging 8 to 12 miles wide and is capable of great development. The population at present is about 20,000 and at least one-half the island is fine agricultural land, particularly adapted to hay and stock raising. The construction of the Algoma Eastern Ry., formerly known as the Manitoulin and North Shore Ry., has been most eagerly looked forward to for years by the Manitoulin Islanders.

The writer has been in charge of the completion of this line as Chief Engineer since the work started, with B. E. Barnhill as Division Engineer, and headquarters at Sudbury.



A.C. and H.B. Ry. Alice Lake Trestle, Magpie Branch.

Dominion Government Railway to Hudson Bay.

Tenders were received, May 16, for 40 sets of switches and frogs at present required for the line.

Specifications and plans are reported to have been completed for the second section of this line, and Ottawa press reports state that tenders for its construction are to be invited at an early date. The section will be 120 miles long, and will carry the line to the point at which the route is common, whether the terminal on the bay is at Port Nelson or Fort Churchill. With a view of determining this, it has been decided to send out a further exploratory expedition, by the Dominion Government s.s. Minto. In addition to the work on the bay at the two ports, the expedition will report as to lighthouses and other aids to navigation necessary in Hudson Strait. (May, pg. 240.)

The 24-Hour Time System in which the hours of the day and night are numbered from 0 to 24, beginning at midnight, is to be adopted on the French Government railways, beginning with next summer's schedule.

Diaphragm Between the Cab and Tender on C. P. R. Passenger Locomotives.

Although the discomforts experienced by the engineer and fireman in severe weather have long been recognized by different railways, up till recently no definite steps have been taken to improve their conditions of operation by protecting them in some measure from the inclemencies of the weather, and the extreme cold found in certain localities during the winter.

The Canadian Pacific Ry. has solved this problem in a large measure in the manner indicated in the accompanying illustrations, figs. 1 to 3. The rear end of the cab, instead of being left open and unprotected except for the canvas drop in general use, is completely closed in by the arrangement shown, the rear end only having an opening in the centre, in line with the coal door opening of the tender. Around the contour of this opening there is a diaphragm ring similar to that found on the end of vestible coaches, only not as deep. This ring may be seen to the best advantage in fig. 3, where it will be noticed that it is rivetted to the rear wall of the cab to form an integral part thereof.

A corresponding diaphragm ring slightly smaller is held in close contact with this cab ring by four plungers carried in the front wall of the tender, and which project back into the coal space, as may be seen to the left in fig. 3. The construction of this plunger may be seen in fig. 1 of the diaphragm mechanism. The plunger, guided in a bushing in the tender wall, bears against a coiled spring in a pipe barrel, being thereby kept at all times in its forward position, holding the two diaphragm rings in close contact.

Provision for taking up the angular movement between locomotive and tender when taking a curve or when swaying on rough track, is provided for in a simple manner, as may be seen from fig. 1 in the section of the diaphragm mechanism. In the first place, the connection between plunger and tender diaphragm ring is made with a ball and socket joint which allows the necessary angular movement at that point. Attached to this tender diaphragm ring there is a plate cut out to the contour of the opening into the tender coal space. The vertical faces of this plate carry eight hinges—four on each side—attached to which are two vertical plates at right angles, bearing against the walls of the entrance into the coal spaces by means of springs at each of the hinges, so that the locomotive on rounding a curve compresses the springs on one side and releases them on the other, maintaining a tight connection between the cab and the entrance into the coal space. At the hinged joint, the hole in the flap part of the hinge is elongated to allow for relative side movement when rounding a curve. A loose unhinged joint is left along the top edge of the opening, as there is but little relative movement between the two.

It will thus be seen that the whole weight of the tender diaphragm ring and parts is supported from the plungers, which have a fixed position outside of their sliding movement. From the ball and socket joint on the outer end, alignment of the tender diaphragm ring is maintained; while the side flaps for keeping a tight connection along the sides of the passage into the tender, are held in contact by the angular coiled springs bearing on the ball and socket joint of the plunger. The connection between engine and tender is by this means kept quite tight. The only opening to the rear is the shovel opening at the lower edge of the coal doors, the latter only requiring to be opened when it becomes necessary to pull down coal from the top of the pile. Even that operation is made unnecessary except when the coal shifter with which all

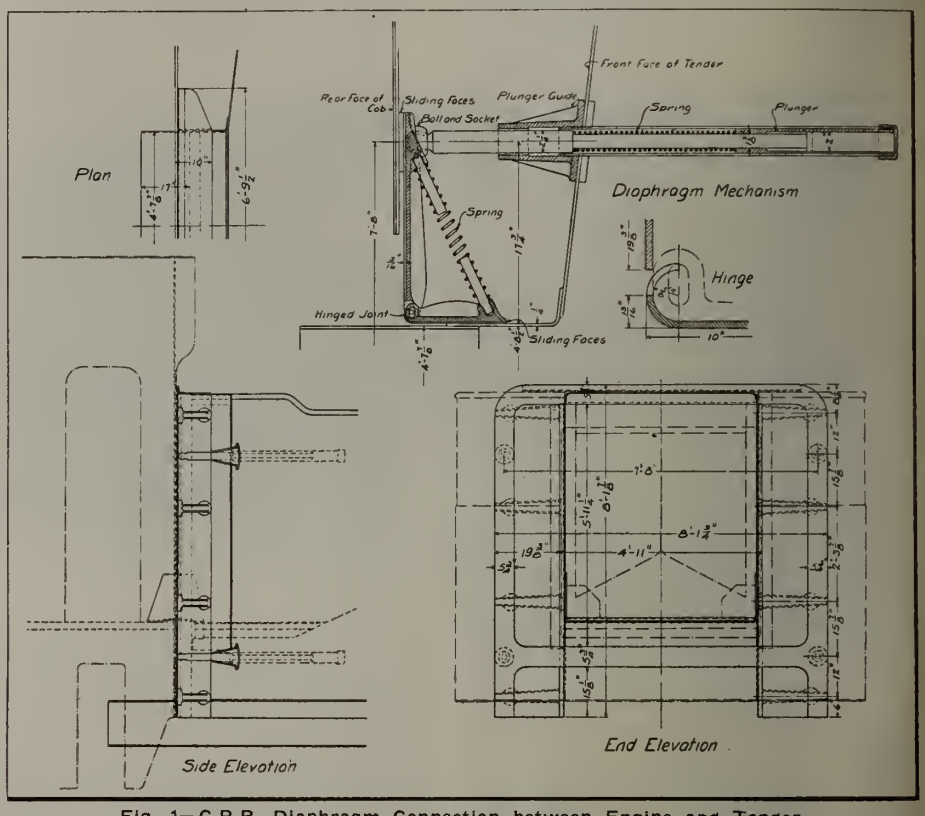


Fig. 1—C.P.R. Diaphragm Connection between Engine and Tender.

Fig. 2—Entrance and Steps of Diaphragm Cab.

Fig. 3—Top and Rear View of Diaphragm Connection.

these diaphragm cabs are equipped, is out of order, which is sometimes the case from their freezing up.

The old entrance through the rear of the cab is replaced by a door opening in the side of the cab near the rear end, as shown in fig. 2. Inset steps, built into the sides of the cab walls, which are continued down below the cab floor an amount sufficient to embody the steps, lead into the cab through this side entrance, replacing the former offset steps at the rear end of the cab.

A number of passenger locomotives have so far been equipped with this new diaphragm cab, most of those now in service being on the three runs of the Montreal-Toronto line. Their introduction has met with great favor from all concerned with their operation.

The Oxy-Acetylene Process in the Railway Shop.

By Frederick H. Moody, B. A. Sc.

The technical press has been devoting considerable space during the last few years to the uses of the oxy-acetylene process in the railway shop, more particularly on locomotive repair work where work must be produced expeditiously so that the earning power of a locomotive on the road might not be lost during the period that would be required to make the customary repairs. Most of these articles describing the advance of the subject, and its all round usefulness, have dealt with the practice followed in the United States, the instances cited coming for the most part from the same place. While the practice on both sides of the line is identically the same, the progress made in Canada concurrently with that in the United States, ought to be described in order to emphasize the fact that equally extensive repair and general work is being undertaken on this side of the line, and that the process where installed has been developed to an equal degree.

Modern conditions of keen competition involving the introduction of more efficient, and in some cases scientific, management, require that the methods of doing work must be constantly being improved in order that the quality of the work may be raised, and at the same time have the cost of production decreased—improvements in both directions. Oxy-acetylene would seem to be doing all this, with a saving of time, less waste, increased output and greater efficiency. This is emphasized by the speed with which a crippled locomotive may be taken into the repair shop and be completely repaired in a remarkably short time as compared to former methods. In addition, there is the factor of making many complicated repairs that would not be considered possible by the older methods, or, if considered possible, would not be deemed worth while from the poor quality of job that would result.

The term "welding," as applied to the oxy-acetylene process, is somewhat a misnomer, as dictionaries define it as "to press or beat into intimate and permanent union," neither of these actions entering into the process, it being purely autogenous, more metal building up the fractured place, heat alone entering into the operating mediums, with no pressure involved.

A fusion of the metals subjected to the oxy-acetylene flame causes the molten portions of the parts to commingle to form the union. This flame is said to have a temperature in excess of 6,000 degs. Fahr., formed by the mixing in the proper proportions of oxygen and acetylene gas at the tip of a torch. This very high temperature is the result of the fact that acetylene gas has more weight per given volume than any other combustible gas, and is the closest approach to gaseous carbon known to chemistry. In consequence, the temperature of combustion is very high and intense heat is generated.

Two systems of operation are employed on this continent—the high and the low pressure. It is the former of these two that is in most general use, the acetylene gas being led to the nozzle of the torch under an appreciable pressure instead of the oxygen, which is under pressure in both systems, drawing the very low pressure acetylene along with it to the point where it ignites. The Academy of Science in France determined that the proper proportions for the two gases to give the best results was one of acetylene to a little more than one and a quarter of oxygen.

Impurities in either of the gases tend to produce inferior work, and the intensity of the flame is decreased so out of proportion to the amount of the impurities that the cost of the work increases very rapidly. This makes good gas a prime requisite. Impurities in the acetylene are largely due to the heat evolved in the acetylene generator after it has been in operation for some time. This internal heat produces other hydrocarbons in the gas, giving the resulting flame a carbonizing effect that will harden the weld and make it brittle.

There are two classes of welds. The first, for very thin plate, requires the addition of no extra material at the weld, the edges being brought into intimate contact and fused together. The second class, for heavier plates, requires that the contact edges be chamfered, and the groove thus formed is filled with the same metal under the torch.

The general consensus of opinion among the users of the oxy-acetylene process seems to be that a long period of trials and tribulations is almost invariably experienced before satisfactory results can be obtained. The earlier experiences often lead to a desire to reject the process in favor of the older methods of repair, so discouraging are the results obtained in the earlier stages. In most instances, where the operator perseveres, very satisfactory results are the outcome, and the oldest users are for the most part the most enthusiastic advocates.

A few examples of the use of the process and the results obtained, as they have come under the notice of the writer, will undoubtedly prove of interest. In the C.P.R. shops at West Toronto, the process has been carried to as fine a stage of development as is generally to be found in the railway repair shop. Here, the locomotive shop has been piped throughout with acetylene, with connections at convenient points, these connections being painted red for identification purposes to prevent confusion with the air piping.

In these shops, a great variety of work is handled, though the principal work is that of patching up boilers, for which the oxy-acetylene process is peculiarly adapted. The accompanying illustrations show two instances where heavy repairs were made unnecessary. In fig. 1, the front end of the inside sheet at the bottom of the water leg near the mud ring had been so reduced in thickness, from the attacks of acid water accumulating in the interior at that point, that the plate was considered dangerous. Under former conditions, this would have required a patch to cover this part of the firebox, a construction that in itself is objectionable from the fact that it makes a double thickness wall through which the heat has more difficulty in penetrating, and, in consequence, that part of the inside sheet is particularly liable to further damage from burning. The oxy-acetylene process solved the difficulty. The original piece that had been corroded was first of all cut out by the oxy-acetylene flame, removing the whole area that was affected. The oxy-acetylene flame in removing the injured piece cuts it out perfectly clean, the flame penetrating a small incision made at one end, cutting along at a rapid rate with a narrow cut. The holding staybolts are drilled out and the damaged portion removed. Another piece of good plate is then cut to the shape of the removed portion, and the staybolt holes laid out and drilled or punched to make it in every way a counterpart of the removed piece. The joining edge of this plate, as well as the good edge of the side sheet, are chamfered, and the new piece bolted in place

Fig. 1—Patching the Inside Sheet of the Firebox by the Oxy-Acetylene Process.

Fig. 2—Repairing the Front Tube Sheet by the Oxy-Acetylene Process.

as indicated. With the torch and a piece of filling wire, the joining crack is filled up, making a perfect joint with nearly unit strength. The staybolt holes are then tapped from the outside sheet, and the bottom rivet holes reamed through the mud ring, when, with the insertion of the staybolts and rivets, the firebox is again ready for service.

The front tube sheet in fig. 2 is similarly treated. The lower part, containing 19 tube holes, became eaten away, and would have required a whole new tube sheet had it not been amenable to the oxy-acetylene process. The latter method was used. Twelve bridges were cut across with the flame, and the rivets at the bottom driven out, removing the section. A new piece, similar in every particular, was then bolted in position, and the chamfered edges of the flanges and bridges were filled in by the torch, making a perfect weld. The rivet holes and tube holes then required reaming out.

The firedoor opening, from the repeated working action due to alternately heating and cooling, frequently breaks across, or checks at the rivet holes. Such injuries are repaired in the same manner as above, by the cutting out of the injured piece and welding in a new piece.

Numerous other parts of the boiler are amenable to the oxy-acetylene torch. Patches may be made in almost any part of the boiler, interior or exterior, as the foregoing examples indicate. A novel use of the torch for repair work on the boiler came to notice recently at the West Toronto shops. After nearly every trip on the heavy Muskoka run in the summer, it was found that the large superheater flues leaked at the front tube sheet, and required to be caulked before further service could be had out of them. The idea of welding them to the sheet suggested itself, and on trial was found to be so successful that all the flues are now welded into place, and no trouble is experienced with leaky superheater flues.

Cast iron parts of the locomotive can likewise be welded. At West Toronto recently, a steam pipe crack some 2 or 3 ft. in length was satisfactorily welded. From Montreal comes a report of the broken flange of the cast iron cylinder being mended. One of the cover studs, on being screwed into the cylinder head, broke inwards a piece from the cylinder bore, the broken fragment measuring about 2 ins. along each edge. This was satisfactorily welded into place. Greater welds than this on cylinders have been reported.

The steel underrigging of the locomotive may also be repaired. At the West Toronto shops, links, spring hangers, motion work parts, etc., are being repaired.

Frames are rarely welded by this process of autogenous welding, these for the most part being fixed with thermit. An instance of the use of the oxy-acetylene process on frames occurred recently on a G.T.R. locomotive that broke down near Orillia and was repaired at that point. It was an old 8-wheeler with the driving wheel jaws integral with the top rail, and bolted to the lower rail by flanges from the jaws. Front and rear of one of the driving wheel journals and on each side of the locomotive, these jaws had broken, making four breaks in all. These were put in good order by welding with oxy-acetylene.

In car repair work, an instance occurred recently that demonstrated the value of this new process. Heating coils have a marked tendency to break along the original weld of the pipe, which, if even for a short distance, destroys the coil. These coils cost $65 to replace, but can be repaired in a very short time at small expense by the oxy-acetylene flame.

Around the shop itself, among the tools, there are numerous places where it can be used. One particularly useful purpose to which it is applied is that of welding high-speed steel ends on to soft-steel bodies, effecting a material saving over solid tools, and at the same time presenting a means of utilizing the used up old tool end stubs.

In electric railway work, another field is presented, but this end does not seem to have been developed to the same extent as in steam railway practice. One instance in Canadian electric railway practice came to notice recently, in which a considerable saving was effected, as the part repaired was one that involves a very important item of expense in electric railway rolling stock maintenance. The article referred to is the motor shell. These shells frequently have one of the pinion shaft lugs broken off, causing the discarding of the shell. By the oxy-acetylene process, these broken off lugs can be welded on to give a casting as strong as it was before the fracture. Such repairs have been made for the Montreal Tramways Co.

While the foregoing examples do not cover a great many different parts, they are varied sufficiently to show the possibilities of the system; and, what is even more important from the standpoint the writer had in mind when planning this article, it shows the extent to which the process has been introduced in Canada, and that Canada is doing work that is equal to any that is being done abroad or to the south.

Largest Non-articulated Locomotives.—What is said to be the largest non-articulated locomotive ever constructed has recently been delivered to the Chicago, Burlington and Quincy Rd. by the Baldwin Locomotive Works, on an order of five. These locomotives, of the 2-10-2 type, are replacing 2-6-6-2 type ones of the same power on that road, which is significant of a return to solid wheel base locomotives. The total weight of this locomotive is 378,700 lbs., of which 301,800 lbs. is on the drivers. The average weight per driving axle is in excess of 60,000 lbs. The locomotive wheel base is 39 ft. 8 ins., with a solid driving wheel base of 21 ft. 7 ins.

The Intercolonial Ry. has substituted the a la carte system for the table d'hote system on its dining cars.

Folding Washstand for Canadian Pacific Railway Sleeping Cars.

For a great many years there has been practically no change of importance in the interior arrangement of sleeping car washrooms other than the constantly improving refinement in interior finish of the room and parts, with the addition of a few added comforts. But in so far as any change from conventional lines is concerned, there has been but little development, the changes for the most part being those of refinement alone, with nothing radically new involved.

A departure from this state of affairs that has great bearing on comfort to the travelling public has been embodied in the washroom construction of the sleeping car Sicamous, recently built at the C.P.R. Angus shops, Montreal, this innovation taking the form of a folding washstand. It only requires mentioning to bring to the minds of all, the limitations to the present washstand system in the smoking compartment. For a period extending over about half an hour in the morning, the washstands are the scenes of great activity following the call to rise. This rush period over, there is but little further requirement for washing facilities, except at odd times throughout the day, for which purpose a single basin would prove ample. But under the standard arrangement the three stands are there all day, and, what is more important, occupying valuable space in the smoking room, which is always in great demand during the daytime and evening.

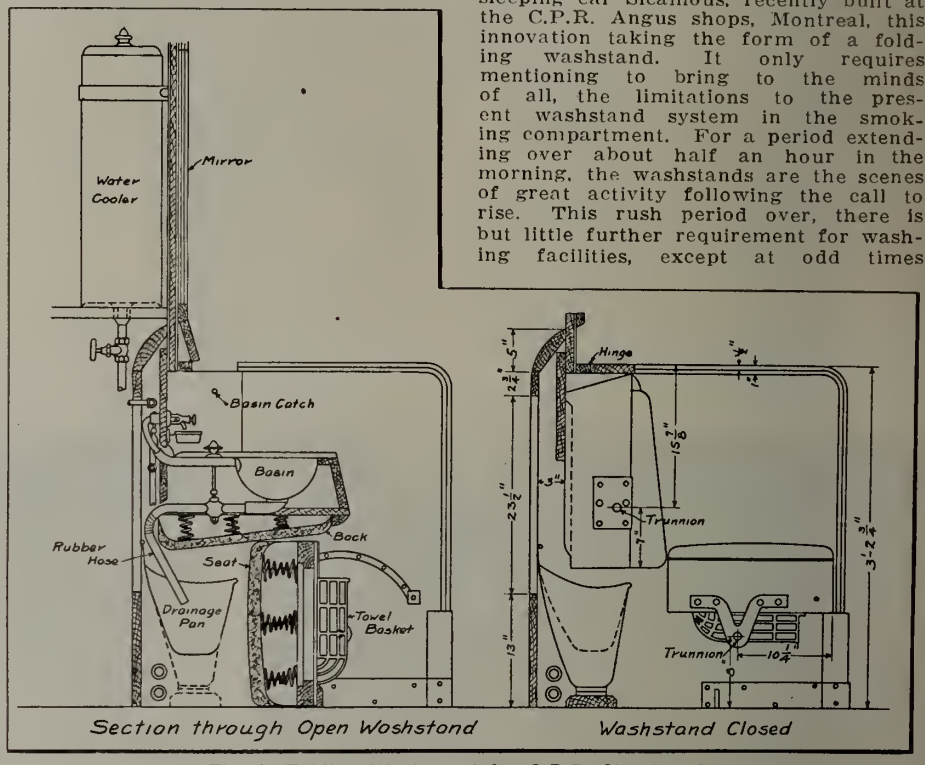


Fig. 1—Folding Washstand for C.P.R. Sleeping Cars.

The idea was conceived of utilizing the greater part of this space to advantage as seating room by making two of the three washstands convertible into seats, the third stand made stationary, providing sufficient washstand capacity for the light hours. The construction and arrangement of the folding or convertible stand as installed in the Sicamous is shown in the accompanying illustrations. The construction and operation of the parts is shown in fig. 1; the folding washstand open in fig. 2; the same stand converted into an upholstered seat in fig. 3, and the permanent washstand in fig. 4. Referring first to fig. 1, the construction will be examined. Swinging on trunnions at their ends, there is a seat and a seat back, both so arranged that they may be swung around through a right-angle turn, catches in these two positions of each, locating the seat and back in their open or closed positions as desired. The seat contains no features of peculiar interest other than the soiled towel basket attached to the seat bottom, and which is

thrown into position by the act of opening the stand. When used as a seat, this basket is underneath and out of sight.

The seat back, containing the two basins, is unique in design. Its front is leather upholstered like the seat, but the rear face of the back contains the basins with the necessary pipe connections ingeniously arranged. In the wall out of which the basins swing, there are the usual faucets (see also fig. 2), but from the fact that the basins are not permanently located, there cannot be a solid pipe connection from the faucets to the basins. This is taken care of very simply by having a small diameter pipe so located that when the basins are swung into their operative position, this pipe will slip into another pipe of somewhat larger diameter connecting with the basin. The fit between the two pipes is of necessity very loose, but splashing is prevented by having the smaller pipe enter the larger as far as the swinging construction will permit. Both hot and cold water connections are handled in this manner—the faucets stationary with intermediate loose joint. The waste stopper is in the swinging basin table, the waste pipe leading back from the centre of the basin to the rear of the swinging part, where a rubber hose connection draws the water off into a sloping drainage pan beneath, passing out of the car from this point in the usual channels. As fig. 2 indicates, the basin, table, and all the fittings are nickeline, and in almost every particular resemble the permanent basins of the C.P.R. standard practice.

At the top of the seat back there is a hinged flap under the mirror which, when lowered on the seat top when the latter is up, finishes off the seat in such a manner as to give it a permanent appearance as fig. 3 shows.

The impression might be gathered that in the construction of the basin in the seat back in this manner the water might leak over into the interior of the leather upholstering and destroy or damage it. However, the construction is such that the water will have difficulty in working through, and any that does manage to find its way through the crevices will quickly be dried up by the heat of the steam in the coils under these convertible seats.

The one permanent wash basin is shown in fig. 4, this basin being the one nearest the smoking compartment entrance, so that the convertible seats are in the desirable location beside the window. An intervening wall between this basin and the seats protects the occupants from splattering water.

The one car equipped has been so successful that others with this installation are planned, and cars being remodelled are having the smoking compartment changed to meet this new arrangement. The seating capacity is nearly doubled, making the arrangement particularly desirable on such runs as that taken by the Sicamous, which operates on the Montreal-Chicago run, the sleeping car running through partly in the daytime for the convenience of through travellers.

Fig. 2—Folding Washstand Open for Use.

Fig. 3—Folding Washstand as a Seat.

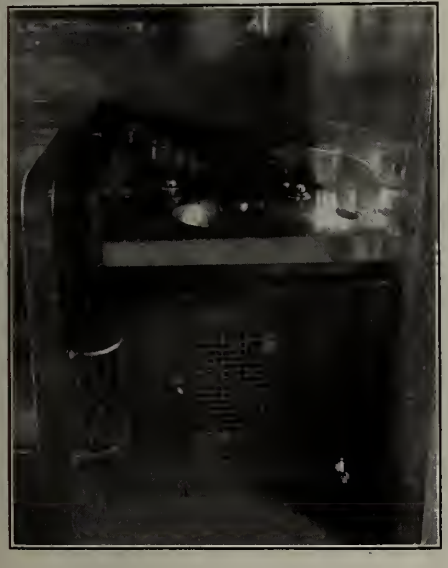


Fig. 4—Permanent Washstand Adjoining the Folding Ones.

Leaky Roofs of Box Cars.—To determine the facts of a common complaint that considerable damage is caused from leaky box car roofs, two Atchison, Topeka and Santa Fe Ry. officials at Springfield, Mo., made an inspection of a number of such cars recently during a severe rainstorm. Of 52 cars examined, 38 were found to be leaking through the roof and 7 through the sides. In all there were 152 leaks, an average of 4%. The cars examined were representative of most of the leading roads, indicating that this trouble is quite general. It is estimated that not much more than 10% of the box cars in service are proof against leaks.

Delaware and Hudson Co's. Annual Report.

The annual report of the Delaware and Hudson Co., which owns the Quebec, Montreal and Southern Ry., and the Napierville Jct. Ry. in Canada, for the year 1911, shows a net revenue of $116,710.26 from its coal mining department, and a net revenue from the operation of its railway department of $8,663,647.35. After providing for bond interest, etc., the net income carried to profit and loss is $5,237,680.87, equal to 12.32 per cent. on capital account. Dividends at the rate of 9 per cent. are provided for the current year out of profit and loss.

The report contains the following information relative to the Canadian lines:—

The Quebec, Montreal and Southern Ry. shows an increase in operating revenues for 1911 of $73,435.58 as compared with 1910. The operating expenses show an increase of $108,632.73, making a decrease in net operating revenues of $35,197.15. The net income, independent of interest charges due the D. and H. Co. was $136,819.80, a decrease of $41,736.94. The decrease in net operating revenues is due largely to the extraordinary charges for maintenance during the year, there being an increase of $14,878.81 in ties and $22,198.54 in bridges, trestles and culverts. The Frappier bridge burned twice in Aug., making necessary heavy temporary repairs. Maintenance of equipment shows an increase of $14,519.35 due to repairs and renewals of steam locomotives and freight train cars. The Napierville Junction Railway shows an increase in operating revenues for 1911 of $1,386.28 as compared with 1910. The operating expenses show an increase of $5,821.45, making a decrease in net operating revenues of $4,435.17. The net income was $21,910.09, or 3.65 per cent. on the capital stock outstanding. The decrease in net operating revenues is due largely to an increase in amount paid for injuries to persons.

The total assets of the company are $17,198,620.23, the Canadian lines being valued at $6,308,139.79. The stocks owned by the company include $1,000,000 common stock of the Quebec, Montreal and Southern Ry., $600,000 common stock of the Napierville Jct. Ry.

No separate statistical figures are given for the Canadian lines.

Railway Mechanical Methods and Devices.

Multiple Drilling Machine at the Central Vermont Railway Shops.

The accompanying illustrations show a multiple drilling machine of rather unique construction, which is in regular service in the C.V.R. car shops at St. Albans, Vt., and is giving excellent satisfaction for strap work and such commonly occurring members. The interesting feature lies in the fact that the feed is hydraulic, the table feeding upward by hydraulic pressure against the drill heads.

Rear and side views of the machine

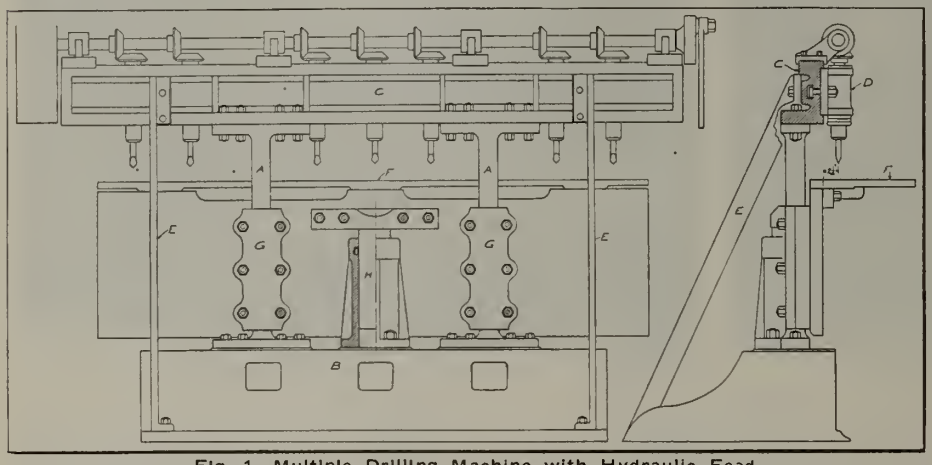


Fig. 1—Multiple Drilling Machine with Hydraulic Feed.

are given in fig. 1, and in fig. 2 the press is shown as installed. The construction can be seen to better advantage by an analysis of fig. 2. Two 2½-in. forged rods, A, bolted to faced spots on a cast-iron base, B, carry on their upper ends a cross-arm, C, which is machined on its front face, and on the top and bottom edges. The supports, B, are bolted to the lower edge. The front face has a bolt head groove in the centre of a wide channel running the full length of the face. Fitting into this recessed face, there are drill heads, D, held in place by bolts in the before-mentioned bolt groove. These drill heads are adjustable within the ranges on the cross head face, so that any hole spacing may be provided for. A drive shaft mounted in bearings on the top of this cross arm, carries adjustable bevel gears mating with the bevel gears on the upper ends of the drill spindles. The bearings mounted at intervals along the top form the limits of movement of the different drill heads; there are three heads between the centre bearings, and two on each side between the outer bearings, making seven in all. The drive is through a pulley from the main drive shaft overhead. The cross rail is braced in position by two wrought iron straps, E, from the rear, attached to the outer edge of the base casting, which is imbedded in the floor level with its upper face.

The drill table F is vertically guided on the supporting rods A by bearings G, on a face casting to which the table is bolted as indicated. These guiding bearings are of such ample proportions as to insure a rigid support to the table, which is free to be moved vertically through the limitations of the supports A. The table is fed upward against the drills by means of the hydraulic plunger H, bolted to a faced spot on the top of the base casting, and secured at the top to the back of the table support. Introducing hydraulic pressure under the plunger at the desired rate of entry, raises the table, feeding the work against the drill instead of the reverse, as ordinarily.

In order to be self-contained, the machine is provided with a pump, the arrangement of which is shown in fig. 2. A pump rod, A, connects to one end of a link, B, the other end of this link B being suspended by another link, C, from the end of the top cross bar of the drill. The suspended link B is in form like the link of the Stephenson motion, from the fact that it is slotted and has a sliding block in that slot, this block being attached to the upper end of the pump piston rod, the latter receiving its motion therefrom. The lever D, with its attached bell crank and short link from the bell crank to the suspending link C, is provided to shift the slotted link from side to side to give the required pump plunger stroke, which, by this means may be regulated at will. It is by means of this that the rapidity of the feed is regulated.

The pump itself is contained in a small tank which acts as a reservoir for the water forced by the pump under the drill table plunger. On releasing the pressure under this plunger by shutting off the pump, accomplished by throwing the lever into its uppermost position, which moves the link C into line with the pump plunger, the water runs back into the reservoir to be used again indefinitely.

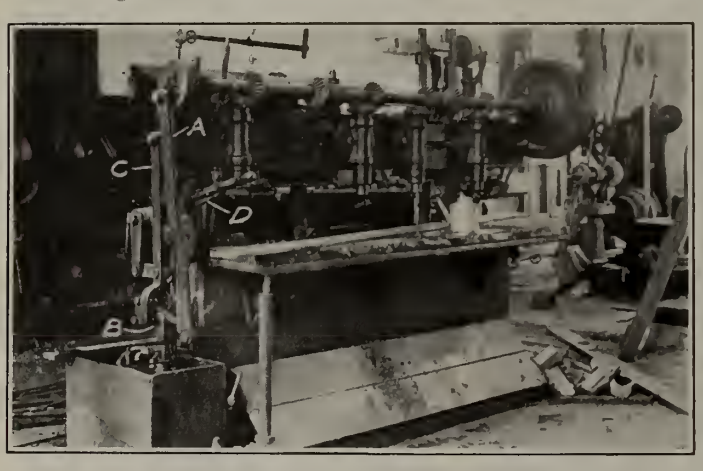


Fig. 2—Installation of Multiple Drilling Machine.

Mould for Forming Piston-rod Packing at the Pere Marquette Railroad Shops.

The Pere Marquette Rd., in its St. Thomas, Ont., shops, has a novel method of casting metallic piston-rod packing rings which is peculiarly its own. It is essentially a die-casting process, and the methods involved are almost identical with those used in that industry.

A couple of the packing rings, freshly cast, as they come from the moulds, are shown on the stand at A in fig. 1. This illustration shows the assembled machine ready for use, while in fig. 2 the details of the device are emphasized.

Referring to fig. 2, it will be noticed that the body casting A contains a plunger rod B, with a mandrel end C. Fitting over this mandrel end are two die rings, D and E, forming with the mandrel an annular cavity, F, the shape of the completed packing ring. These two rings, D and E, are held together against the shoulder of B by a taper key fitting through the diametral slot G.

To provide for pouring, there are small channels on the inner faces of D and E. When ready for pouring, the plunger B is forced to the right by the lever H (B in fig. 1), bringing D and E into the opening I, thereby aligning them perfectly. A V-shaped cut-out, J, in the face of A, registers with the pouring holes in D and E. To facilitate the handling of the outer section E of the mould, it is attached to a long handle K (C of fig. 1). Removing key G and forcing to the right, releases the cast ring.

The packing rings thus formed are quite clean, and ready for service, the finished faces of the mould making it unnecessary to further finish the rings. Two smaller rings of half the width, and with an outside diameter equal to the inside diameter of this bevelled one, are

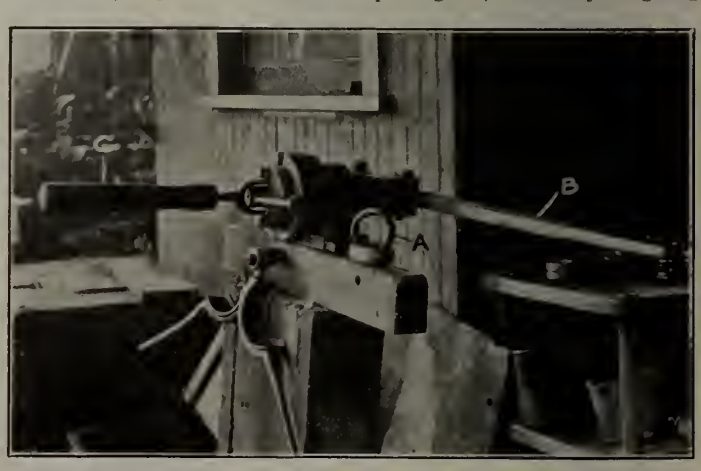


Fig. 1—Mould for Piston Rod Packing with Samples of Work.

cast in a similar manner. These, when slit with a saw, are placed inside this bevelled ring, and over the piston ring. The three being made of bearing metal, are soft, and readily form into a steam-tight joint when compressed by the gland.

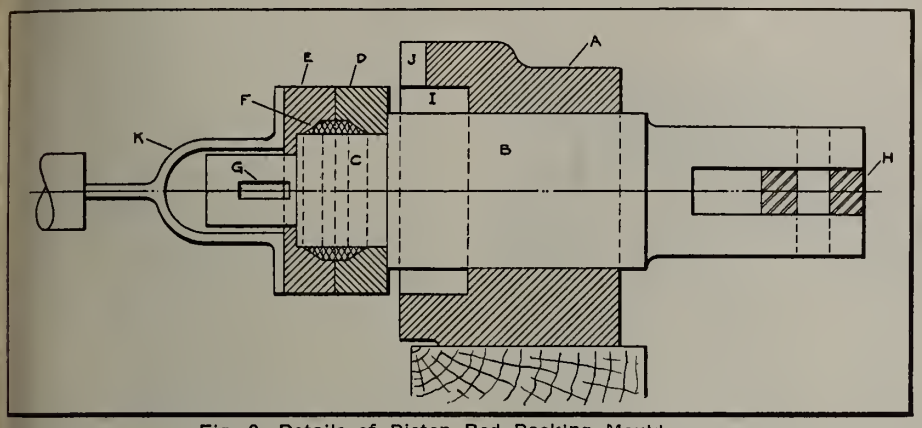


Fig. 2—Details of Piston Rod Packing Mould.

Tools for Boring Side and Connecting Rods at the G.T.R. Point St. Charles Shops.

The method of boring side and connecting rods, and the tools employed, as practised at the Grand Trunk Ry. Point St. Charles shops, Montreal, are shown in the accompanying three illustrations. A side rod as mounted for machining is shown in fig. 1. This rod, mounted as indicated, is first drilled at both ends

Fig. 1—Boring the Ends of a Side Rod.

to give the central guiding holes for the tools to follow. The two drilling heads are rapidly adjusted for the standard lengths of rods to be machined, by having gauge plugs, as at A, fig. 1, tapered and fitting into corresponding tapered holes through the drill head carriage and supporting cross arm. These holes have been carefully located, drilled and reamed for locating the two heads in drilling the ends of practically all the standard lengths of side and connecting rods. In consequence, the setting up of the job requires no special attention, the standard length being absolutely determined.

The drilled hole for guiding is usually put through with a 1½-in. drill. This is followed by a coreremoving process with the tool indicated in fig. 2. This tool is shown on the drill table at B in fig. 1. Referring to fig. 2, it will be noticed that the tool body is a cut-away shell, A, with two vertical faces, to which are bolted by bolts in slots, tools B, projecting a short distance below the lower edge of the shell wall. Through the centre of this shell there is an elongated guide tit, C, of a diameter cor-

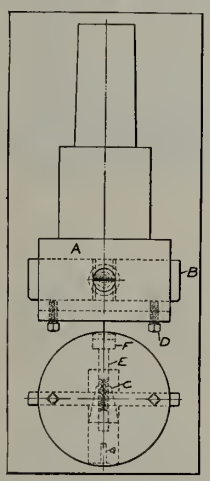


Fig. 2—Tool for Coring Rod End.

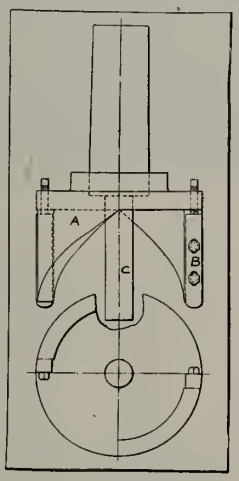


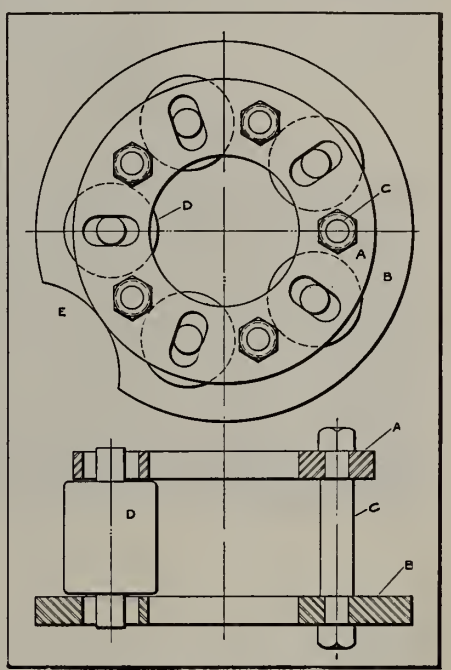
Fig. 3—Tool for Boring Rod End.

responding to the diameter of the drilled hole in the end of the rod to be machined. The upper end of this guide bar, above the shell, has a taper shank fitting the spindle of the drill head. The tool, held in the drill spindle by this taper shank, and guided in the rod being drilled by the lower tit end, cuts down into the metal of the rod end, a core of the metal being thus removed without chipping the metal into cuttings. This cutting tool forces its way through the metal quite rapidly, saving considerable time, and leaving a block of metal that is useful in the blacksmith shop for making up small forgings.

The next operation is that of boring out the cored holes to a slightly larger size, that being the operation shown in process in the drill in fig. 1. The tool employed is shown in fig. 3. A taper-shank body, A, carries in a cross slot two cutters, B, each of these cutters bearing at the inner end on a taper pin, C. The two cutters are held up against their seats by the two set screws, D. The taper pin C is tapped to receive a threaded screw, E, the latter seating in the recess F in one side of the tool body. The taper pin C also has a squared hole, G, in its outer end, by means of which it is drawn into the body, forcing out the cutters into the correct location. This tool finishes the hole to the approximate size, only requiring to be reamed out with the reamer at C, fig. 1. This completes the machining of the pin holes in the end of the side rod.

Superheater Flue Roller at the Michigan Central Railroad Shops.

The accompanying illustration shows a simple construction of superheater flue roller as made by J. Sumner, toolmaker at the Michigan Central Rd., St. Thomas, Ont., shops. The device consists simply of two steel rings, A and B, held parallel at a definite distance apart by five shoulder bolts C. Intermediate to these shoulder bolts are five radial slots in which hardened carbon steel rollers are free to slide radially. A long driving pin, with a taper of 1 in 24, introduced



Superheater Flue Roller.

in the central opening, forces the rollers out on the tube walls, in the usual manner. The ring B has a cut-out on one side as at E, in order that the tool may clear the adjacent flue. The ring A has a diameter 1-32 in. less than that of the flue, thereby acting as a guide for the whole device in entering.

The National Association of Station Agents will assemble at Chicago on Sept. 7 and travel by special train over the Minneapolis, St. Paul and Sault Ste. Marie Ry. to Duluth, spending Sept. 8 there, then going via M.S.P. and S.S.M.R. to Winnipeg, staying there a day, and then via C.P.R. to Vancouver, where the convention, etc., will occupy three days. From Vancouver a steamboat will be taken to Seattle, the train being sent on via C.P.R. and Northern Pacific. From Seattle the party will return to Chicago via Chicago, Milwaukee and St. Paul Ry., making some stops en route. The trip will occupy about three weeks.

Canada Northwest Land Co.—Follow-are the officers and directors for the current year, who were re-elected at the annual meeting recently:—President, Sir Edmund B. Osler; Vice President, W. D. Matthews; other directors, F. S. Meighen, J. M. McIntyre, Sir Thos. G. Shaughnessy, Sir Thos. Skinner, Lord Strathcona, Sir Wm. C. Van Horne.

The Abolition of the Common Drinking cup on all trains and at all railway stations in Idaho, Washington, Montana, Minnesota and North Dakota was agreed upon at a recent conference of representatives of the boards of health of those states.

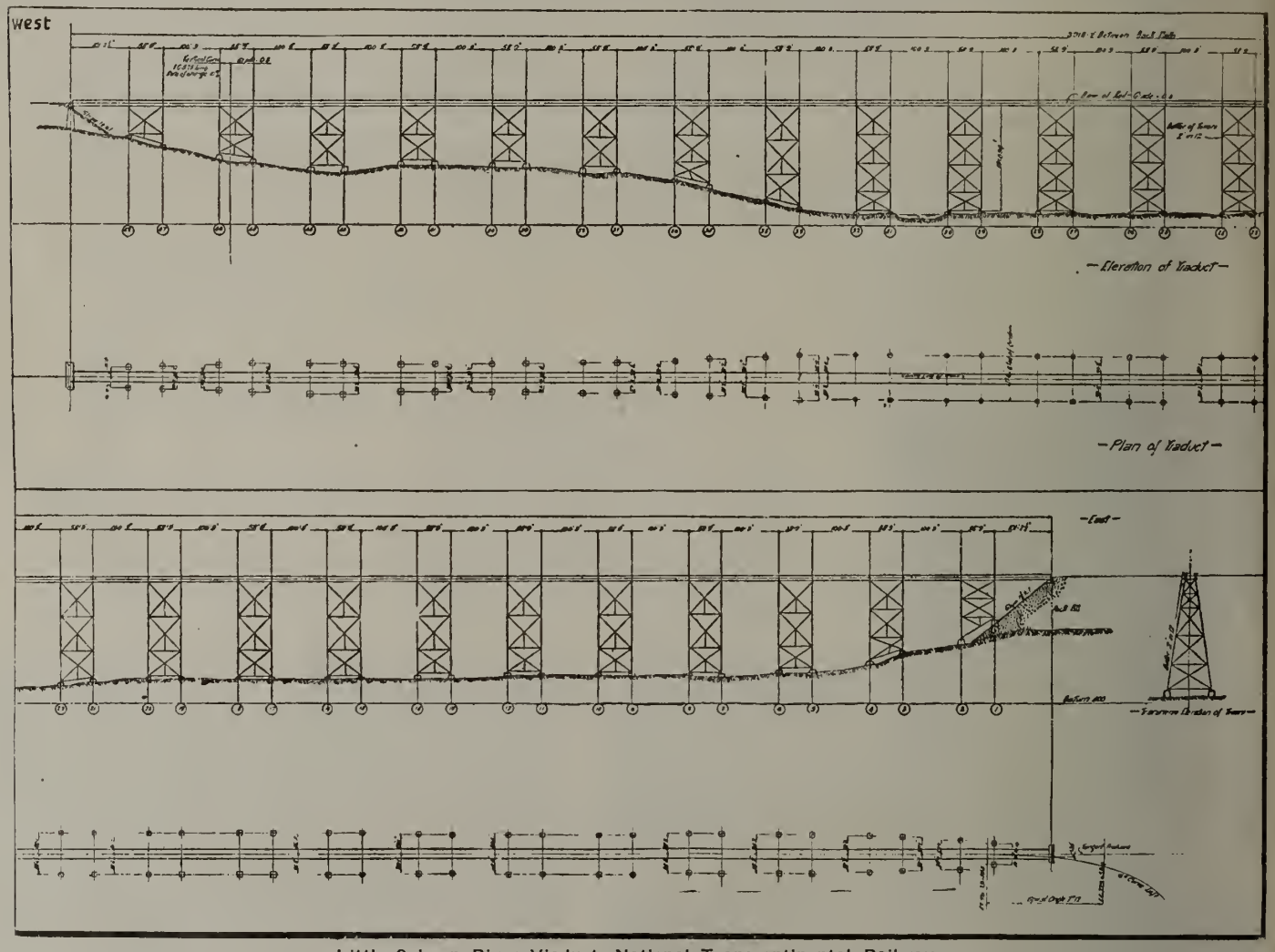
The Little Salmon River Viaduct, National Transcontinental Railway.

By R. F. Uniacke, M. Can. Soc. C.E., Bridge Engineer, N.T.R. Commission.

The act of Parliament authorizing the construction by commission, of the Eastern Division of the National Transcontinental Ry., provides for a location from its eastern terminus, Moncton, through the central part of the Province of New Brunswick, and through the Province of Quebec by the shortest available route to the city of Quebec. At the time of the inception of the Intercolonial Ry., New Brunswick had been thoroughly explored before the final location was adopted, and the controversy of the routes has been fought out over both these great public undertakings. Three routes were located for the Intercolonial, known at that time as the frontier, the central, and the Baie des Chaleurs routes, and of these, on the recommendation of the Chief Engineer, and owing to Imperial considerations, since a subsidy aid had been granted by the Home Government, the Baie des Chaleurs route was adopted.

The engineers of the Transcontinental had located two lines, one known as the river route, following the St. John River, north from Fredericton, and the other the central route; the latter was adopted as fulfilling more closely the provisions of the act. That a railway has now been constructed along this route having a ruling 0.4 compensated grade, with a maximum curvature of 6°, is owing in a large measure to the advance in modern bridge and high viaduct construction. The valley of the Little Salmon River, 185 miles from Moncton, presented one of the obstacles to be overcome, as the grade development showed a crossing over 4,000 ft, long, with a height of 200 ft. above the water line. The description of the design and construction of this viaduct the writer has undertaken to present in this paper.

The line approaches the west end of the structure with a 6° curve through a rock cutting and crosses on a tangent bearing N. 10°—27 ft. W., the grade rising 0.40 ft. per hundred. The layout consists of 24 towers 58 ft. 9 in. centres and 25 intermediate spans 100 ft. 3 ins. c. to c., the end spans being 100 ft. 10½ ins. centre of bent to outer end of steel; all the tower spans are alike and also the intermediate spans, except that the masonry ends are extended to give the required bearing. The towers and bracing are made alike as much as possible, necessitating one set of templates only for the spans and parts of towers which duplicate each other. A through girder system of construction was adopted, the girders being spaced 17½ ft. c. to c., while the floor beams with gussets were spaced 14 ft. c. to c., along the plate girders. The east end span is on a spiral to a 6° curve and in consequence the girders are deflected at this abutment 1 ft. 3 ins. off the tangent to the structure produced. There were several reasons which led to the adoption of a through girder system. In high trestle construction, where the use of false work is out of the question, the most economical layout is that of an intermediate span as long as can be handled with a well designed traveller working from grade, so as to reduce the number of high towers, their pedestals and foundations. Spans of 60 ft. with 40 ft. towers are generally employed where deck girders are used, spaced 9 ft. c. to c., and bridge ties resting on the top flanges. Owing to the through girder system having a spacing of girders 17½ ft. c. to c., spans of 100 ft. are handled, since the bearings of the traveller rest on the flanges. thus giving that much more base to brace the traveller in handling loads. The stability of the erection outfit is amply provided for so that in this case girders weighing 30 tons were placed in position. It certainly gives a feeling of safety to see from the car window the flanges of a heavy steel girder, and that this is not altogether sentiment is shown by the fact that instances of derailment are recorded, in which the car held to the roadway by the lateral resisting power of these girders.



Little Salmon River Viaduct, National Transcontinental Railway.

SUBSTRUCTURE.—The approach at the east end being through a rock cutting, in order to avoid building the steel work on a curve, and also to utilize the material in the cutting without waste, an abutment of reinforced concrete placed on top of the rock fill was decided on. A buried pier built from the original surface at this point would have been over 100 ft. high, difficult to design and build, and very costly. This was avoided by the use of a bank abutment. The concrete was reinforced to prevent danger of cracks from settlement in the

bank, and in order to give time for the bank to settle the ends of the girders were temporarily supported by a crib work of square timber, before building the permanent abutment.

In the design of the pedestals and west abutment, borings and test pits were first made to determine the character of the soil. This proved to be of compact sand, gravel and hard pan, so that no piling was required, the footings being designed to distribute the load at a pressure of from 2.5 to 4 tons per square foot. The four pedestals near the water line at the banks of the river were built with curved cutwaters, the axis of piers being parallel to the direction of the current, forming suitable ice-breakers. The anchor bolts for pedestals consisted of two rods, 2 ins. in diameter, the lengths varying according to the uplift to be resisted. These rods were anchored at the bottom by spacers of 10 in. channels and washers, the concrete being built around them. In order to give room for a little variation in their position, conical forms were set around each bolt, a lip being left at the top extending beyond the base plate of column through which these voids were filled with grout after the steel was erected. The west abutment or buried pier was about 40 ft. in height above the footing course, and in order to reduce the pressure on the soil and allow the embankment to run through and surround it, an arched void was left in a longitudinal direction. No difficulty was experienced in building to this design.

In laying out the work no triangulation was required and an ordinary steel tape was used, the writer's experience being that, as provision is made in the girders for expansion, a slight variation in the position of the anchor bolts is permissible, providing the expansion slots are made longer than the theoretical length requires. The chief difficulty consists in maintaining the anchors in a vertical position and protecting them from rough usage from swinging buckets of concrete and other causes.

CONCRETE.—The materials used in the concrete were Portland cement, sand and gravel, the two latter being obtained on the bank of the river near the bridge site. In this locality good sand is very difficult to obtain and, after a test of sand from several pits, the local material was selected, the sieve test showing after the gravel was screened out:

Retained on 20 mesh sieve	64%
Retained on 30 mesh sieve	17%
Retained on 50 mesh sieve	15%
Retained on 74 mesh sieve	2%
Retained on 100 mesh sieve	2%
	100%

After treating the finer residue with a 20% solution of sulphuric acid, it was found to contain 6% of soluble matter, which was eliminated by through washing, and a mixture of one part cement, two parts sand, and four parts gravel, varying from the size of a pea to 3 ins., was obtained. As the sand was not of the best quality, the use of 1-2-4 mixture was ordered in shafts of pedestals, since they have to sustain a high concentrated load on a comparatively small volume of concrete. The concrete used in the buried pier and foundations was a 1-3-5 mixture. In obtaining a proper facing mixture the coarser material was kept away from the forms by the use of perforated spades, pushed down and drawn back while the mixture was still plastic. This method was found more satisfactory than that of attempting to bond a facing mixture into the body as required in some specifications.

CEMENT.—The following description of the method adopted for sampling and testing the cement used on all structures under construction on the N.T.R. may be of interest. The cement specifications are standard, and the governing tests are for fineness, specific gravity, soundness, time of setting, and tensile strength. The cement shall not acquire its initial set in less than 45 minutes and must have acquired its final set within 10 hours, the briquettes being kept in a damp closet for 24 hours and afterwards immersed in water until time of breaking.

It is the writer's practice on receiving notice that a consignment of cement is to be shipped to a contractor to send an inspector to the mills to draw samples from the bags as they are being loaded into the cars; one bag in 40 is sampled, both doors of the car sealed with the N.T.R. lead seal and the sample cases forwarded to the cement testing laboratory in Ottawa, in charge of a chief cement inspector attached to the Bridge Engineer's office. The seal being intact on arriving at the bridge site is a notice to the field inspector that the car has been sampled by the Bridge Department. The preliminary tests for soundness are made at once, the mills are notified to hold the cars if these results appear doubtful, and the final record covering the full 28 days tests is generally completed and the contractor advised of the acceptance soon after the cars are on the work. In mills where the records have been continuously good, the contractor has been permitted to use the cement on completion of the

Fig. 1—General View.

Fig. 2—100 ft. Girder Raised.

Fig. 3—100 ft. Girder Ready to Place, Erection Struts in Position.

seven days test, in some cases where work would be held up for want of cars, but always at the contractor's risk and subject to the 28 days tests; in no case where this has been allowed has the result proved a mistake in judgment. A cement sampling record slip is enclosed in the sealed sample case giving all information as to shipment. Copies of the final test record are furnished to the district engineer as well as to the mills for comparison with the manufacturer's tests, and the records are compiled in loose leaf books for future reference.

Fig. 4—100 ft. Girder in Place.

Fig. 5—Working Platform of Traveller.

By means of these records and a system of reports from the field inspectors of the arrival of cars, it is an easy matter to trace any car and identify its contents after being piled in the cement storage house at the bridge site.

DESIGN.—The Dominion Government specifications were strictly adhered to in the proportioning of the members. The compression members were figured for the pin ended formula of these specifications. In the tension members of the towers a limiting length of 200 l/r was used to avoid sagging of members, to make them capable of resisting compression and to give initial stiffness. The use of bulb angles in the sway bracing of towers makes a very stiff and economical section and avoids breakages in shipment, the great fault in box laced section of light angles. Traction and wind were figures as called for in the specifications.

The posts viewed from the stress sheets do not appear to be economical, because of their relatively small radius of gyration when compared with a built up channel section; but the saving in weight of details and simplicity in shop work fully compensates for the extra main material. In the light of column tests it is reasonable to expect that the reduction in unit stresses for the increase of radii length would not be justified by practical tests. The metal is used mostly in directly resisting the primary stresses, as very little is required for secondary purposes (viz., lattice tie plates, etc.), and in this way a stronger column is obtained. The section used has also the advantage of continuous webs in each direction, which are geatly superior to the easily bent lattice bars, and moreover the interior of the column is much more accessible to the paint brush for shop and field coats. The section is symmetrical on both axes, having therefore its centre of gravity in the centre of the section, and no eccentric loading is induced from the girders. The small amount of redundant metal means uniformity of stress in the columns, and simplicity in the make up will decrease the cost of maintenance.

Fig. 6—Rivetting Galleries.

Fig. 10—Placing Last Girder Span.

TENDERS.—In calling for tenders for the steel work our usual practice was followed of furnishing bridge companies with a general design and details of girders and towers, together with a printed form of tender in which was filled in the estimated weights of steel, and number of feet b.m. of timber in the floor. With this system all bridge companies bid on the same basis, and are not required to make a single drawing to submit with tenders, but merely to fill in the unit prices for steel and timber erected in place, and to carry out the amounts on the estimated quantities furnished, viz., steel 14,000,000 lbs., timber 520,300 ft. b.m. After the tender is awarded the bridge company submits stress sheets and details for approval before ordering the material from the mills.

FLOOR.—The rails were directly supported by 8 in. x 12 in. x 14 ft. bridge ties resting on the steel stringers, every fourth tie being 16 ft. long to support the plank footway placed outside the guard timber for the convenience and safety of the section men. An outside guard timber 8 in. x 9 in. dapped 1 in. over the ties. which were spaced four inches apart in the clear, the ties were secured to the stringers by ¾ in. hook bolts, and the guard timbers bolted through the tie with one ¾ in. bolt in every fourth tie. A steel guard rail 60 lbs. to the yard will be placed inside the gauge line, and 8 ins. therefrom in the clear, these guard rails coming together at the centre of the track one rail length beyond the end of the bridge and being protected by a cast steel point fitting the rail section and spiked to the road bed ties.

ERECTION.—Actual erection began July 27, 1910; the steel was all assembled and last span swung Feb. 8, 1911, and all riveting and painting fully completed by Aug. 19, 1911. Material was unloaded at a siding at the west end and handled by a two boom derrick car in the storing yard. A light standard gauge locomotive with lorry cars handled the material from the storage yard to end of steel. The main feature of the

erection outfit was the 30 ton two boom erection derrick, travelling on the top flanges of the girders, the trucks of the traveller running on 115 lb. crane rail, the base of which rested on timber temporarily secured to the girder flanges. This derrick was self-propelling by means of a chain and sprocket connecting the trucks with the erecting engine, which consisted of two 10 x 12 in. cylinders—2 drum—4 spool hoist. The 115 ft. booms were box section composed of 4 36 in. x ¼ in. web plates at centre section and tapering at the end, connected with four 3½ x 3½ x ⅜ angles. This section was found to weigh actually less than a latticed section and the combined unit stresses from compression and bending were very much reduced. The writer was told that the men working on the traveller, and assembling, were very enthusiastic over the ease with which the big machine handled its work. The wind at the deck of the trestle was very strong, and was generally blowing at right angles to the bridge, but the work was practically never held up on account of too much wind. The use of the erection struts is shown in fig. 2; after a tower and its girders were assembled the erection struts were removed and used again to stiffen the first bent of the next tower until it too was connected and self sustaining. The hook bolts temporarily connecting the ends of three struts with the columns proved very efficient.

Another important feature was the use of riveting bridges for convenience and safety of the men in assembling, riveting, and painting. By reference to figs. 6, 7 and 8, the method of handling them will be plainly seen. They were carried along the top of the trestle by the two boom yard derrick car, and after being secured to the top flanges of girders by hooks, the cages were

Fig. 8—Rivetting Gallery in Position at Top Tower.

lowered or raised by hand, as required. the free end of the tackles being on the platform, so that the riveters could slack away themselves.

The erection staff varied from 60 to 80 men, of which but 6 were employed on the big traveller, 1 subforeman and 14 men were used to assemble the steel work, and the rest formed from 2 to 6 gangs of riveters, also crew for derrick car used for unloading material in yard, and delivering same to traveller, and driver for light locomotive. The riveting gangs averaged 302 rivets a day of 10 hours per gang, a rate which would probably have been reduced by 50% if ordinary staging had been used, instead of the riveting cages.

The accompanying table showing progress of erection indicates rather remarkable time, considering the force employed. A pair of 100 ft. girders

Fig. 7—Method of Raising and Moving Rivetting Galleries.

were swung and bolted in their final position in 37 minutes, and floor beams and stringers assembled in half a day.

PAINTING.—One coat of black metalastic paint was used in the shop, with a coat on each contact surface before assembling. Two field coats were applied, the first metalastic brown, and the final coat acheson graphite. Rivet heads and shop marks were touched up before applying the field coats. The use of a different shade for the first field coat was a great help to the inspector, to enable him to see that the several coverings were properly applied.

THE INSPECTION of this work covers mill, shop, and erection inspection, all in accordance with the Dominion Government specifications of 1908. The bridge company, on being advised of the name of the inspection company, which is to do the inspection, is required to furnish it in triplicate with copies of all mill orders; one copy is furnished the bridge engineer, and one copy is sent to the inspection company's representative at the mills where the material is to be rolled.

The inspector then makes arrangements to be present at the rolling of the material which is being furnished on these orders, making complete surface inspection of every piece, measuring it for width and for length, and gauging the thickness. Specimens are then selected from the material so inspected by the representative of the inspection company, taken from each heat of steel which has been rolled into the material furnished on his particular order. These test pieces so selected are then forwarded to the machine shop to be properly prepared, that is to say, machined on both edges and straightened true. The test pieces so prepared are then sent to the testing laboratory at the mills, where the same are measured and broken in the testing machine, in the presence of the inspector. The results of this test piece have to conform with the requirements of the specifications, that is to say, the tensile strength has to be within the limits, also the elongation and reduction of area of the steel. The inspection company, in addition to witnessing the pulling of these test pieces previously selected by their representative, also secures from the rolling mills a certificate of the chemical analysis which may be found in the steel so tested. Frequently the inspector requires drillings to be taken from the test pieces at the mills, so as to check up the accuracy of the reports presented to him by the rolling mill company. Test pieces and material which they represent are identified by melt numbers.

As soon as the surface inspection of the material has been made, and the tests have proved satisfactory, the inspector then undertakes to see that the material is properly loaded in the cars ready for shipment to the bridge works. Full descriptive reports are then made out by the inspection company, showing the number of pieces and the size and length of each piece so shipped from the steel works, together with the results of tests. These reports are then sent forward to the bridge engineer.

SHOP INSPECTION.—As soon as the material has been received at the bridge works, the same is then unloaded, and when work is ready to commence, the various pieces of material which go to make up a full sized member are brought into the shop. The representative of the inspection company is present to see the laying off of the material, the first step in the preparation for punching. The punching is then witnessed by the inspector to see that punches and dies of the correct size are used, as required by the Dominion Government specifications. The inspector then further sees that the material, as soon as it is punched, is properly assembled, and that a sufficient number of bolts are used, so as to insure perfect fit and matching of all holes, prior to the same being riveted. The process of riveting is also supervised; and, lastly, the finished member is checked over to see that the measurements and clearances are correct, and that construction is in full accordance with the shop drawings submitted by the bridge com-

Fig. 9—Method of Erection.

pany and approved by the bridge engineer.

The painting, which is also a very important part of the work, is then closely supervised, to see that the temperature in which the material is painted is suitable for such painting, also that the material so painted is stored under cover until such paint has become thoroughly dry.

After all these several stages of con-

struction have been witnessed, and also the final checking up of material, full detail reports are made out showing what material has been constructed during the week, also what other material is under course of construction, and what material has been shipped, also commenting on any errors that may have been discovered and how the same have been remedied, with a report in addition as to what future progress would be expected.

Inasmuch as this material was purchased on a pound price, the inspection company had special representatives at each of the bridge plants, estimating the weights of all material entering into the various bridge members, so as to check up against the actual weights furnished by the bridge company. If the actual weights are in excess of 2%, as allowed by the Dominion Government specifications, such weight is cut down to the estimated weight, made up by the inspection company, based on an allowance of 2%.

INSPECTION OF ERECTION.—As soon as the bridge companies have made shipment of their first carload of material, and the erection gang of the bridge company has arrived at the bridge site, on the order of the bridge engineer, an inspector is immediately dispatched by the inspection company to such site. He supervises the erection of the entire structure from start to finish, seeing that the same is carried out in strict accordance with the requirements of the specifications. As the work progresses, the inspector takes at least three photographs each week, showing the progress that has been made, and also keeps an account of the labor expended in connection with the erection of the particular bridge on which he is engaged. To show that the photographs are taken weekly, a special sign is furnished by the inspection company, on which the name of the structure appears, together with the date on which the photograph was taken. This is embodied in the photograph. Weekly reports are furnished by the inspector, and the bridge engineer is kept advised as to all movement or delays that might occur at the erection site in connection with such structure. On completion of the bridge, the inspection company then reports that the work has been carried on to the satisfaction of its inspector, and such report is forwarded to the bridge engineer, who, himself, or his representative, then makes final inspection of such bridge structure, after which payments for the completed work are made. In all the various departments of inspection at the mills, at the bridge shops, and on erection, only men who have had long experience and training in that particular class of work are engaged.

Throughout all the various courses of construction a private stamp is used, bearing the trade mark of the inspection company, together with a number representing the inspector who has used this particular stamp. This serves as a means of identification, so that the inspector at the shop, and also at the field may see that the material has been inspected and accepted. By this means if any faulty or defective workmanship should show itself, the inspector who passed this particular piece of work can be easily located by the number which he carried affixed to his stamp.

COST AND ESTIMATES.—In the final estimates the actual amounts and cost under the several items are:

Substructure—			
1,757	cu. yds.	1-2-4 Concrete at	$15.00
6,524	cu. yds.	1-3-5 Concrete at	11.00
4,597	cu. yds.	Excavation at	1.00
10,534	cu. yds.	Excavation at	2.50
Superstructure—			
Steel 13,991,310	lbs.	at 4.68 cts.=	$654,793.31
Timber 518,041	ft. B.M.	at 4.60 cts.=	23,829.89
			$678,623.20

Progress estimates were paid monthly on the superstructure according to the following basis:

	Unit.	Rate.
Steel	100 lbs.	$ 4.68
Timber in floor	M.B.M.	46.00
SCHEDULE FOR MONTHLY ESTIMATES.		
Steel provided	100 lbs.	$2.00
Steel manufactured	100 lbs.	1.00
Steel delivered at site	100 lbs.	.40
Steel assembled	100 lbs.	.98
Steel riveted	100 lbs.	.15
Steel painted and fully completed	100 lbs.	.15
		$ 4.68
Timber delivered	M.B.M.	$40.00
Timber framed and placed	M.B.M.	6.00
		$46.00

This basis of payment was considered a fair and equitable distribution of cost throughout the different stages of manufacture. It is the result of experience on many bridges previously built by this and other bridge companies on the described method of working and specifications, and the writer believes may fairly be used in other similar cases, as proportionate cost data.

The work was carried out under the general direction of the writer from the Bridge Engineer's Office in Ottawa, W. A. Duff, A.M. Can. Soc. C.E., Assistant Bridge Engineer, having charge of the general design and details. The Dominion Bridge Co., Ltd., Montreal, were the contractors for the steel, which was efficiently carried out, F. P. Shearwood, M. Can. Soc. C.E., having charge of the design for the bridge company.

The design and layout for the erection and the traveller were made under the direction of Jas. Finley, superintendent of erection, who was responsible for the successful carrying out of the erection. also E. W. Nichols, foreman on erection.

The substructure was completed by Powers and Brewer, subcontractors under Willard Kitchen Co. The construction and laying out of this part of the work was performed under the direction of C. O. Foss, M. Can. Soc. C.E., District Engineer. Although the work was prosecuted in all seasons of the year there has been no accident or casualty of any kind.

PROGRESS OF ERECTION LITTLE SALMON RIVER VIADUCT.

1910.	No. of Days.	Erected to Bent No.	Tons.	Aver. per day Tons.
To July 30	..	48	112¼	....
July 30 to Aug. 6	6	47	87¼	13½
Aug. 6 to Aug. 12	5	44	355	71
Aug. 12 to Aug. 18	5	43	60½	12.1
Aug. 18 to Aug. 19	1	42	128¾	128¾
Aug. 19 to Aug. 23	3	41	101¾	32
Aug. 23 to Aug. 24	1	40	129¾	129¾
Aug. 24 to Aug. 26	2	39	102¼	51.1
Aug. 26 to Aug. 29	2	38	132¼	66.1
Aug. 29 to Sept. 16	5	35	436	*87.2
Sept. 16 to Sept. 24	7	33	298½	42.6
Sept. 24 to Oct. 4	8	30	441¾	55.2
Oct. 4 to Oct. 11	6	28	351¼	58.5
Oct. 11 to Oct. 17	5	27	172¾	34.5
Oct. 17 to Oct. 22	5	25	328	65.6
Oct. 27 to Oct. 28	5	23	324¼	64.9
Oct. 28 to Nov. 2	4	22	162	40.5
Nov. 2 to Nov. 5	3	21	152½	51
Nov. 5 to Nov. 12	7	19	320¾	45.9
Nov. 12 to Nov. 16	3	18	308¾	103
Nov. 16 to Nov. 18	1	17	152	152
Nov. 18 to Nov. 20	2	16	159	79.5
Nov. 20 to Nov. 23	3	15	152	50.3
Nov. 23 to Nov. 28	4	14	156¾	39.2
Nov. 28 to Dec. 2	4	13	150	37.5
Dec. 2 to Dec. 7	4	12	155	39
Dec. 7 to Dec. 12	4	11	148	37
Dec. 12 to Dec. 16	4	9	311½	78
Dec. 16 to Dec. 21	4	8	154	†38.5
Jan. 5, 1911, to Jan. 11	6	7	147	26½
Jan. 11 to Jan. 16	4	6	153	38¼
Jan. 16 to Jan. 22	5	5	146	29.2
Jan. 22 to Jan. 25	3	4	146	48.6
Jan. 25 to Jan. 28	3	3	118½	39.5
Jan. 28 to Feb. 2	4	2	132¼	33
Feb. 2 to Feb. 7	5	1	98	20
Feb. 7 to Feb. 8	1	End	93¼	93¼
	144		7,042.5	48.9

*Held up 11 days by broken gear in traveller.

†Shut down for holidays.

The foregoing paper was read before the Canadian Society of Civil Engineers recently.

C. P. R. Observation Cars on the Austrian State Railways.

The Canadian Pacific Ry. has made a contract with the Austrian Government for the supply and operation of ten observation cars on the more picturesque sections of the Austrian State Railways, through the Austrian Alps. Switzerland is also interested in the new project, as arrangements have been made whereby the cars will run through to Zurich, on the main line to Vienna through that point. The service to be introduced would seem to be meeting with great popularity, for it has already been suggested in the Hungarian Parliament that pressure be brought to bear at Vienna so that this service may be extended to include Budapest, the capital of that part of the dual empire.

When it was decided that an observation car service would be a desirable adjunct to the service in the Tyrolese sections of the state railways, consideration was given to the designers that were considered the most capable of undertaking such an installation. The result was that the C.P.R., on account of its varied experience in the handling of observation traffic through the Rocky and Selkirk Mountains, was considered the best fitted to undertake such a task.

While the cars will be altered slightly to meet local conditions, they will follow very closely in design the standard platform observation cars that have met with such success on the C.P.R., the principal difference being that they are to have platforms at each end, as on these Austrian lines there are no ready means of turning cars of the length contemplated. In width and height the cars will be somewhat smaller than the standards on which they are being modelled, necessitated by the smaller clearance lines followed on the Continent. In length, they measure 22½ metres (74 ft.), making what are said to be the longest 4-wheel truck cars in Europe. The seating capacity per car is to be 32, which may be used by either first or second class passengers for the additional fare of 5 kronen ($1). This price will include the use of a stenographer and typewriter, and an interpreter capable of speaking in the principal languages of cosmopolitan intercourse, and in addition, the cars are to be equipped with medicine chests.

The cars are being built at the Nesselsdorf works in Austria, from designs worked out in the C.P.R. mechanical department at Montreal, under the supervision of H. H. Vaughan, Assistant to the Vice President, who was in Vienna last year making final arrangements for the construction of the cars to meet the local conditions under which they are to be operated.

The service to be given this summer will comprise three lines—Zurich to Innsbruck, Vienna to Innsbruck, and Salzburg to Trieste. These three lines, as well as any to be added in the future under the present arrangement, are to be operated from the new C.P.R. offices in Vienna, under the supervision of G. McL. Brown, European Manager, C.P.R., in London.

Grain Shipments by Rail.

The following shipments of grain from Fort William and Port Arthur, Ont., were made during the close of navigation from Dec. 1, 1911, to Apr. 30, 1912.

	Bush.
Wheat	14,020,912
Oats	6,131,679
Barley	245,977
Flax	1,302,987
Rye	3,421
Total	21,704,976

The Grand Trunk Railway Co.'s Semi-Annual Meeting.

Following are extracts from the report for the half year ended Dec. 31, 1911, presented at the semi annual meeting in London, Eng., April 18:—

Following is a comparison of the half year's revenue account with that of the corresponding half year in 1910:—

1910.		1911.
£3,699,899	Gross receipts	£4,135,755. 2 3
2,790,686	Deduct—Working expenses 75.21%, compared with 75.43% in 1910	3,110,870 14 2
£ 909,213	Net traffic receipts	£1,024,904 8 1
38,426	Balance of income from rentals, outside operations, and car mileage	11,675 19 3
£ 947,649	Total net revenue	£1,036,580 7 4
	Add—	
16,013	Received from International Bridge Co.	16,012 16 7
6,507	Interest Central Vermont Ry. bonds	6,506 14 3
70,941	Interest on securities controlled lines and St. Clair Tunnel bonds acquired by issue of G.T. 4% debenture stock	72,780 0 3
40,146	Balance of general interest account	53,175 10 4
£1,081,256	Net revenue receipts	£1,185,055 8 9

Following are the net revenue charges for the half years of 1910 and 1911:—

1910.		1911.
£ 77,603	Rents (leased lines	£ 77,603 0 9
525,749	Interest on debenture stocks and bonds	560,314 10 9
32,332	Interest on debenture stock and bonds of lines consolidated with G.T.R.	32,419 6 1
40,080	Canada Atlantic Ry. deficit	32,286 2 6
Cr. 3,863	Detroit, Grand Haven, and Milwaukee Ry. deficit	6,641 5 8
23,390	Toledo Saginaw, and Muskegon Ry. deficit (1908-9-10) (1911)	8,901 3 8
£ 695,291		£ 718,165 9 5
385,965	Leaving a surplus of	466,889 19 4
£1,081,256		£1,185,055 8 9

Adding the balance of £11,660 10s 9d at credit of net revenue account on June 30, 1911, to the above surplus of £466,889 19s 4d, the total amount available for dividend is £478,550 10s 1d, from which the directors recommend the payment of the following dividends for the half year:—

4% guaranteed stock	£215,619 5 5
First preference stock	85,420 15 0
Second preference stock	63,210 0 4
1½% on third preference stock	107,469 10 9
	£471,719 11 6

Leaving £6,830 18s 7d to be carried forward.

Following is a comparison of receipts for the half years ended Dec. 31, 1911 and 1910:—

Description of receipts.	1911	1910	Increase
	£	£	£
Passengers	1,239,376	1,127,908	111,468
Mails and express	206,563	197,414	9,149
Freight and live stock	2,541,350	2,254,619	286,731
Other receipts	148,486	119,958	28,528
	4,135,775	3,699,899	435,876

The working expenses, excluding taxes, were £3,021,115 or 73.04% of the gross receipts, as compared with £2,704,-091 or 73.09%, in the corresponding half year, an increase of £317,024, but a decrease of 0.05% in proportion to gross receipts.

The gross receipts show an increase of £435,876, or 11.78%; the working expenses, including taxes, an increase of £320,185, or 11.47%; and the train mileage an increase of 825,372 or 8.55%.

The total charges to capital account were £1,007,041 4s 5d. Of this, £655,-270 8s 5d was for the acquisition of £400,000 Ottawa Terminal Ry. first mortgage bonds and £255,600 G.T. Pacific Terminal Elevator bonds; and £155,545 4s 10d for discount and commission on 4% debenture stock and 4% guaranteed stock sold during the half year.

The expenditure on capital account in respect of new works, double track and land purchased was:—

New works	£177,194	18 10
Double track	261	2 10
Land purchased	18,769	19 6
	£196,226	1 2

No additions to the rolling stock at expense of capital were made during the half year. Ten freight locomotives and 926 steel underframe box cars were purchased, and six first class, five baggage, and two cinder cars were built in the company's shops during the half year on revenue account.

TRAFFIC STATISTICS.

Following is a comparison of the revenue expenditure, including taxes, for the half year ended, Dec. 31, 1911 and 1910.:—

	1911	1910	Increase.	Decrease.
Passengers carried	6,813,784	6,097,487	716,297	
Average fare per passenger	43·65d.	44·40d.		0·75d.
Tons of freight and live stock	10,261,656	8,890,164	1,371,492	
Average rate per ton	59·44d.	60·87d.		1·43d.
Tons carried one mile	1,778,513,307	1,538,361,407	240,151,900	
Earnings per train mile	94·71d.	91·97d.	2·74d.	
Maintenance of way, and structures	£ 581,729	£ 592,719	£	£ 10,990
Maintenance of equipment	792,660	647,680	144,980	
Traffic expenses	131,329	116,768	14,561	
Conducting transportation	1,415,843	1,256,911	158,932	
General expenses	99,555	90,014	9,541	
Taxes	89,785	86,594	3,161	
Total	£3,110,871	£2,790,686	320,185	
Percentage of gross receipts	75·21	75·43		0·22
Expenditure per train-mile	71·24d.	69·37d.	1·87d.	

The average rate per ton per mile on the entire freight business was 0.70c, compared with 0.71c in the corresponding half year.

The train mileage compares with that for the half year ended Dec. 31, 1910, as follows:—

Description of mileage	1911	1910	Increase
Passenger	4,617,360	4,423,504	193,856
Freight	5,595,218	4,974 601	620,617
Mixed trains	267,353	256,454	10,899
Total	10,479,931	9,654,559	825,372

Canada Atlantic Railway.

Following are the results for the half year compared with the corresponding period of 1910:—

1910.		1911.
£198,239	Gross receipts	£229,494
179,763	Working expenses	198,902
£ 18,476	Net traffic receipts	£ 30,592
4,474	Balance of income from rentals, outside operations, and car mileage	2,876
£ 22,950	Total net revenue	£ 33,468

The interest charges were £65,754, against £63,030. There was a net revenue deficiency of £32,286, compared with £40,080 in 1910. The number of passengers carried was 328,372, against 287,943, an increase of 14.04%; and the passenger receipts, including mails and express, were £54,818, against £48,808, an increase of 12.31%. The quantity of freight moved was 844,169 tons, against 720,415 in 1910, an increase of 17.18%; and the receipts from freight traffic were £157,036, against £130,875, an increase of 19.99%.

Grand Trunk Western Railway.

Following are the results for the half year compared with the corresponding period of 1910:—

1910.		1911.
£640,798	Gross receipts	£708,057
502,464	Working expenses	526,537
£138,334	Net traffic receipts	£181,520
Dr. 49,409	Balance of income from rentals, outside operations, and car mileage	Dr. 45,351
£ 88,925	Total net revenue	£136,169

The net revenue charges were £92,187, against £92,150, so that there was a net revenue surplus of £43,982, and deducting therefrom the debit balance of £31,461 at June 30, 1911, there remains a net revenue credit of £12,521, which is carried forward. The number of passengers carried was 1,155,745, against 1,079,337, an increase of 7.08%; and the passenger train receipts, including mails and express, were £269,342, against £242,899, an increase of 10.89%. The quantity of freight moved was 1,830,855 tons, against 1,642,548, an increase of 11.46%, and the receipts from this traffic were £417,855, against £379,704, an increase of 10.05%.

Detroit, Grand Haven, and Milwaukee Ry.

Following are the results for the half year compared with the corresponding period of 1910:—

1910.		1911.
£215,501	Gross receipts	£252,248
174,021	Working expenses	197,233
£ 41,480	Net traffic receipts	£ 55,015
Dr. 636	Balance of income from rentals, outside operations, and car mileage	Dr. 24,675
£ 40,844	Total net revenue	£ 30,340

The net revenue charges were £36,981, the same as in 1910. There was therefore a net revenue deficiency of £6,641. as compared with a surplus of £3,863 for the corresponding period of 1910. The number of passengers carried was 510,-170, against 478,246, an increase of 6.67%; and the passenger receipts, including mails and express, were £84,328, against £74,673, an increase of 12.93%. The quantity of freight moved was 1,368,368 tons, against 1,079,293 in 1910, an increase of 26.78%; and the receipts from freight traffic were £144,124, against £120,432 in 1910, an increase of 19.67%.

Grand Trunk Pacific Railway

The rail has now been laid over the summit of the Rocky Mountains through the Yellowhead Pass, 44 miles west of Fitzhugh, and nearly half way between that place and the next divisional point, Tete Jaune Cache, which it is expected will be reached in June, thus completing 1,100 miles west from Winnipeg. From Prince Rupert, on the Pacific coast, the difficulties with the tunnels, to which reference has been made in previous reports, have been overcome, and the line is now laid to the crossing of the Skeena River, 164 miles east from Prince Rupert. The bridge over the Skeena River is under construction, and when completed the way will be clear to lay the track to Aldermere, 245 miles east from Prince Rupert. It is expected the bridge will be completed by July. The grading of nearly all the branches has been completed, with the exception of about 50 miles on the Calgary branch. About 500 miles of branches already graded are waiting for the rail, which the Canadian steel companies have been unable to deliver.

Reports of Officials.

The Chief Engineer, H. R. Safford, reports under date of Feb. 23: The length of the G.T.R. maintained and operated during 1911 has been increased to 3,545 miles. in comparison with 3,536

miles in 1910. This is accounted for by the construction of a new line, about nine miles, from Tay Jct. to Birch Jct., connecting the 9th and 14th districts.

The expenditure during 1911, for maintenance of way and structures, was $4,756,887.45, compared with $4,663,-272.30 in 1910, an increase equal to 2%. Total average cost per mile, $1,341.85 for 1911. The outlay on track and permanent way, including ballast and ballasting, clearing snow, renewal of rails and ties, and also including their proportion of superintendence, has been $3,355,-541.66, or at the rate of $946.56 a mile. In 1910 the amount was $3,244,751.98, or at the rate of $917.63 a mile, an increase for 1911 of 3.15%. For the repair and renewal of bridges, trestles, and culverts, the expenditure was $312,-756.71, as against $501,352.55 for 1910, a decrease of 37.62%. For the repair and renewal of buildings and fixtures, the cost was $702,513.09, compared with $672,999.72 in 1910, an increase of about 4.39%. For overhead, grade and under-grade crossings, fences and cattle guards, the expenditure shows an increase of $88,658.47 compared with the previous year, the figures being:—1911, $249,-365.84; 1910, $160,707.37.

The maintenance of docks and wharves throughout the year cost $67,-526.64, an increase of $45,467.93 over 1910.

New stations have been built at Crystel, Richmond (temporary), Beloeil, Chaudiere Jct., St. John's (addition), Carrs, Beauharnois, Montreal (Information Bureau, Bonaventure station), Cobourg, Bowmanville (addition), Hawkesbury, Brule Lake, Bear Lake, Manilla Jct., Tioga, Guelph, Stratford, Dublin, Hepworth, Exeter, Thorndale.

The materials used for repairs and renewals of main tracks and sidings were:—New steel rails laid in track, 42,709 tons; partially-worn steel rails laid in branch lines and sidings, 39,250 tons; new ties placed in track, 1,947,363. ballast, 367,535 c. yds.

The work in connection with the terminal improvements at Ottawa is well advanced towards completion. The hotel Chateau Laurier is nearing completion, about 95% of the work being done. The remaining portions consist of the interior decoration and the concrete work incidental to the approach connecting Dufferin St. with the hotel building. The union station building is practically completed, and partially occupied. The steelwork for the train shed has been completed, and concrete work will be resumed within 30 days. The baggage room and power house are practically finished, the only work remaining to be done being the installation of the refrigerating plant.

The work in connection with part 1 of the Toronto grade separation is about 80% completed, the remaining work consisting of about 50,000 c. yds. of grading, the completion of several overhead bridges, including the Sunnyside crossing, and the two subways at Mimico. No work has yet been done upon part 2, as the order of the Board of Railway Commissioners has not yet been issued covering this work and the construction of the proposed new union station.

THE SUPERINTENDENT OF MOTIVE POWER, W. D. ROBB, reports the expenditure, mileage, etc., as follows:—

Half-year ended	Total expenditure	Train mileage	Rate of expense per mile		
			Train.	Engine.	Car.
	Dollars		Cents.	Cents.	Cents.
Dec., 1911.	5,358,124	10,479,931	51.13	38.68	3.13
" 1910.	4,843,710	9,524,919	50.85	39.19	3.30

An increase in expenditure of $514,-414, or 10.62%, compared with an increase in train mileage of 955,012, or 10.03%

	Passenger.	Freight.	Mixed.
The average number of cars moved per train was	5.1	26.1	7.1
And for the corresponding period	5.0	25.3	7.1

During the half year, six engines were scrapped, leaving at the end of the half year five old light capacity engines set aside to be scrapped. Ten Richmond compound consolidation freight engines were purchased, delivered and put into service during the half year. The actual stock at Dec. 31 was 968, against the official figure of 803, being a surplus of 165.

The comparative cost of repairs per train, engine and car mile was:—

Cost per mile.	Repairs and renewals of Locomotives.		All repairing charges, including shop machinery, tools, and marine equipment, &c.	
	1911	1910	1911	1910
	Cents.	Cents.	Cents.	Cents.
Train	14.32	15.77	16.45	18.07
Engine	10.83	12.16	12.45	13.93
Car	0.88	1.02	1.01	1.17

J. COLEMAN, Superintendent, Car Department, reports expenditure, mileage, etc., as follows:—

Half-year ended	Total cost of repairs and renewals.	Total miles run by cars.			Cost per mile.	
		Passenger.	Freight.	Total.	Car.	Train.
	$				Cents.	Cents.
Dec., 1911..	2,186,044	24,196,650	147,197,742	171,391,392	1.275	20.86
" 1910..	1,528,290	22,883,579	124,004,693	146,888,272	10.40	16.05

An increase in expenditure of $657,-754, or 43.04%, with an increase in car miles of 24,503,120 or 16.68%.

Six first class and five baggage cars were built, and two cinder cars rebuilt in the company's works at cost of revenue, and in addition, 926 steel underframe box cars were purchased and charged to revenue.

	£	s.	d.	£	s.	d.	£	s.	d.
RECEIPTS.									
Freight							2,541,350	6	7
Less—									
Cartage, &c.	63,819	7	6						
International Bridge tolls..	15,003	12	7						
St. Clair Tunnel tolls. ..	22,960	15	9						
				2,643,134					
Passenger							1,239,375	10	4
Less—									
International Bridge tolls..	1,673	17	11						
St. Clair Tunnel tolls. ..	7,350	8	3						
				101,783	15	10			
				1,248,400	5	6			
							206,562	6	7
Mail and Express									
Other revenue from transportation				9,024	6	2	98,136	5	4
Revenue from operations, other than transportation.							50,300	4	5
							4,135,775	2	3

EXPENDITURE.

Maintenance of way and structures	14.07%	£ 581,729	0	2
Maintenance of equipment	19.16%	792,660	8	11
Traffic expenses	3.17%	131,328	8	9
Conducting transportation	34.23%	1,415,842	10	5
General expenses	2.41%	99,555	1	0
Total operating expenses	73.04%	£3,021,115	9	3
Taxes	2.17%	89,755	4	11
	75.21%	£3,110,870	14	2
Net income from rentals	....Cr.	66,808	5	1
		£3,044,062	9	1
Dining car service balance...Cr.		2,538	3	11
		£3,041,524	5	2
Hire of equipment balance.....Dr.		57,670	9	9
		£3,099,194	14	11
Balance to net income account....		1,036,580	7	4
		£4,135,775	2	3

Before moving the adoption of the report, the chairman, A. W. Smithers, made feeling reference to the loss of the president, C. M. Hays, his remarks being quoted in our last issue.

The report was unanimously adopted, and dividends declared for the half year, as follows:—2% on the 4% guaranteed stock, 2½% on the first preference stock, 2½% on the second preference stock, and 1½% on the third preference stock.

The directors were also authorized to exercise the powers conferred by the Grand Trunk Act of 1912, which enables the company to assist its various subsidiary companies by issuing its debenture stock against the securities of the subsidiaries, and holding them as additional securities for the debenture stock. The powers will at present be chiefly used in financing the G. T. Western Ry.

The retiring directors, A. W. Smithers, G. von Chauvin, Col. F. Firebrace and Sir W. L. Young, were re-elected for the current year, as were also the retiring auditors, A. F. Whinney, in England, and C. Percy, in Canada.

C.P.R. Hotel Improvements.

Plans are reported to have been prepared for the carrying out of extensive improvements at the Chateau Frontenac, Quebec, this year. A new frontal is to be provided on St. Louis St. facing the Place d'Armes, in which will be located the office and rotunda, the present office space being converted into a tea room. A 14 story tower will be built near the main entrance for the elevator service. The addition will also contain a dining room 120 by 60 ft., with a ballroom over, as well as other rooms. Other additions proposed are a wing to contain the kitchens, pantries, storerooms, etc., the present quarters of these being remodelled. An outdoor cafe along the terrace is also proposed. With these additions, which are to conform in architectural features to the original building, the hotel will have 1,000 rooms, 800 of which will be bedrooms that can be converted into suites, and 350 of them will have private baths.

H. Reed, Manager in Chief, Hotel Department, has just completed a tour of inspection of the company's western hotels. In an interview he is reported to have said that the additions and improvements now under way at the Banff and Lake Louise hotels will give accommodation for 400 additional guests. At Vancouver, owing to the rush of business, it is not likely that the old office wing of the hotel will be torn down until late in the year, but it is possible that a start will be made in the erection of the rear portion of the new wing. The cost of the hotel improvements is estimated at $1,250,000, in addition to $250,000, the cost of the new building for the power plant, which is nearing completion.

Considerable progress had been made with the erection of the new wing at the Empress Hotel, Victoria, B.C.

A press report states that an additional eight guest rooms are to be added by next season to the Chalet at Cameron Lake, on the Esquimalt and Nanaimo Ry.

The Canadian Northern Prairie Lands Co. sold 960 acres during March, realizing $14,400, an average of $15 an acre. The land remaining unsold is 70,840 acres.

Reccnt Provincial Legislation.

The following acts affecting transportation interests were passed by the legislatures of the provinces named at the sessions recently closed:—

Manitoba.

BRANDON ELECTRIC RY.—Amending powers.

CANADIAN NORTHERN RY.—Authorizing guaranteeing of securities for extension of branches.

ELKHORN NORTHERN RY.—Incorporation.

MANITOBA NELSON RY.—Act of incorporation, and a second act repealing the first one.

PUBLIC MARKETS CO.—Incorporation, etc.

PUBLIC UTILITIES.—Creating public utilities commission.

RAILWAY TAXATION ACT.—Amending act.

RURAL RY. OF MANITOBA.—Extending time for construction, etc.

TELEGRAPHS AND TELEPHONES.—Amending act respecting government telephone and telegraph system.

WINNIPEG ELECTRIC RY.—Respecting company's powers.

WINNIPEG NORTH EASTERN RY.—Extending time for construction, etc.

WINNIPEG RIVER RY.—Extending time for construction.

WINNIPEG, SELKIRK AND LAKE WINNIPEG RY.—Confirming agreements between company and the municipalities of Selkirk, Stonewall, and Rockwood.

WINNIPEGOSIS AND NORTHERN RY.—Act of incorporation, and a second act amending the first.

New Brunswick.

BUCTOUCHE AND REXTON RY.—Extending time for construction.

CANADIAN PACIFIC RY. — Confirming agreement between the Dominion Government, the city of St. John and the C.P.R., as to exchange of properties and construction of wharves, etc.

CANADIAN TERMINAL RY.—Extending time for construction.

CENTRAL AND NORTH EASTERN RY.—Incorporation.

FREDERICTON AND GRAND LAKE COAL AND RY. CO.—Amending act of incorporation.

MIRAMICHI BAY SHORE RY.—Incorporation.

MAINE CENTRAL RD.—Conferring certain privileges and franchises.

NEREPIS AND LONG ISLAND RY.—Incorporation.

NEW BRUNSWICK RY.—Authorizing Government to purchase lands from the company and to sell them to settlers.

NORTH SHORE RY. AND NAVIGATION CO.—Incorporation.

ST. JOHN AND QUEBEC RY.—Act of incorporation; act confirming agreement between the company and Dominion Government, and amending certain statutes, granting aid toward the building of a railway along the St. John Valley, and authorizing the town of Woodstock to aid the company in building its shops there.

ST. JOHN DRY DOCK.—Amending acts relating to proposed Imperial Dry Dock in St. John.

ST. JOHN RY.—Authorizing extension of railway into Kings County.

SAINT CROIX DOCKS AND RY. CO.—Incorporation.

SIMONDS PARISH. — Authorizing the parish to grant permission for building of lines on highways.

SUSSEX STUDHOLME AND HAVELOCK RY.—Incorporation.

Nova Scotia.

COMMERCIAL CABLE CO. — Ratifying agreement between the company and the town of Guysboro.

INTERCOLONIAL RY.—Respecting aid granted by Sydney for extension of I.R.C. into the town.

MARITIME TELEGRAPH AND TELEPHONE CO.—Amending powers.

NORTH MOUNTAIN RY.—Extending time for constructing the Dominion Atlantic Ry.'s North Mountain branch.

Ontario.

BERLIN AND BRIDGEPORT ELECTRIC RY.—Authorizing extension of line.

BRUCE MINES AND ALGOMA RY.—Extending time for construction and authorizing extension of line.

DUNNVILLE, WELLANDPORT AND BEAMSVILLE ELECTRIC RY.—Extending time for construction.

GLENGARRY AND STORMONT RY.—Incorporation.

HUMBER VALLEY ELECTRIC RY.—Incorporation.

IRON RANGE RY.—Extending time for construction.

KAWARTHA TRANSPORTATION CO.—Incorporation.

LAE SEUL RAT PORTAGE AND KEEWATIN RY.—Extending time for construction.

LAND GRANTS TO RAILWAYS.—With respect to land grants made to railways, and terminating unavailed grants.

LINDSAY AND MINDEN RY.—Incorporation.

MIDLAND TERMINAL RY.—Authorizing an extension.

MONARCH RY.—Extending time for construction.

MORRISBURG AND OTTAWA RY.—Extending time for construction.

MOUNT MCKAY AND KAKABELEA FALLS RY.—Extending time for construction.

NIAGARA FALLS, WELLAND AND DUNNVILLE ELECTRIC RY.—Extending powers.

NORTH MIDLAND RY.—Extending time for construction.

OTTAWA, SMITHS FALLS AND KINGSTON RY.—Extending time for construction and changing name.

PORCUPINE RAND BILL ELECTRIC RY.—Incorporation.

PORT ARTHUR.—Approving bylaw re electric railway extensions.

RAILWAY ACT.—Amending Ontario Railway Act.

RAILWAY AND MUNICIPAL BOARD ACT.—Amending Ontario Railway and Municipal Board Act.

SIMCOE RY. AND POWER CO.—Extending time for construction.

SUDBURY-COPPER CLIFF SUBURBAN ELECTRIC RY.—Incorporation.

TEMISKAMING AND NORTHERN ONTARIO RY.—Amending powers as to construction, etc.

TORONTO.—Granting certain powers with respect to electric railways.

TORONTO SUBURBAN RY. — Extending time for construction, and authorizing extension of lines.

WHARVES AND HARBORS.—Respecting companies for construction of wharves and harbors.

Quebec.

ARGENTEUIL RY.—Incorporation.

BAGOTVILLE AND ST. LAWRENCE RY.—Incorporation.

GUELPH PATENT CASK CO.—Authorizing company to build and operate railway and branches.

MONTREAL AND NORTHERN COLONIZATION RY.—Extending time for construction.

MONTREAL TRAMWAYS CO.—Amending charter powers. A second act, among other things, confirmed agreement between town of Montreal West, the Montreal Tramways Co., and the Montreal Park and Island Ry.

NORTH EASTERN RY.—Extending time for construction, and changing name to the North Ry.

OTTAWA. ABITIBBI AND HUDSON BAY RY.—Incorporation.

QUEBEC AND LAKE ST. JOHN RY.—Providing for rearrangement of finances.

QUEBEC AND SAGUENAY RY.—Extending time for construction.

QUEBEC CENTRAL RY.—Amending charter, and a second act confirming agreement with C.P.R.

RAILWAY SUBSIDIES. — Authorizing grants of land in aid of building of certain lines.

THREE RIVERS TRAMWAY CO.—Incorporation.

Saskatchewan.

CANADIAN NORTHERN RY.—Two acts authorizing guarantee of certain securities, and amending a previous act guaranteeing securities.

CANADIAN NORTHERN SASKATCHEWAN RY.—Act incorporating company, and an act to authorize guaranteeing certain securities.

CANADIAN PACIFIC RY. — Confirming agreement wtih the Saskatoon city council.

GRAND TRUNK PACIFIC SASKATCHEWAN RY.—Act of incorporation and an act authorizing guaranteeing bonds.

GRAND TRUNK PACIFIC BRANCH LINES.—Amending act guaranteeing bonds.

SASKATOON ELECTRIC RY. AND POWER CO.—Incorporation.

SASKATOON STREET RY.—Incorporation.

SASKATOON TRANSFER RY.—Incorporation.

WATROUS RADIAL RY.—Incorporation.

Railway Route Plans Approved.

The following route plans have been approved by the Minister of Railways since those published in the Railway and Marine World for May, pg. 237:—

ALBERTA INTERURBAN RY.—April 26. From Calgary to Carbon, about 69 miles.

CAMPBELLFORD, LAKE ONTARIO AND WESTERN RY. (C.P.R.).—April 26. Revision of line between Belleville and Agincourt, Ont.

CANADIAN NORTHERN MONTREAL TUNNEL AND TERMINAL CO.—April 30. Line and tunnel in Montreal approved to Lagauchetierre St.

CANADIAN NORTHERN ONTARIO RY.—April 26. St. Eustache to St. Jerome, Que., about 16 miles.

April 26. In the vicinity of Pembroke, Ont., about 10 miles.

CANADIAN PACIFIC RY.—April 26. Revision of Gleichen to Shephard branch, Alberta, mile 0 to 16.

April 26. Swift Current to Camrose branch from mile 154 to 190.

April 30. From mile 115, Cascades sub-division along the north shore of Burrard Inlet to a point in North Vancouver district, about 21 miles.

CENTRAL RY. OF CANADA.—April 26. Between Hawkesbury and South Indian, Ont., 36 miles.

KETTLE VALLEY RY.—April 26. Penticton to Osprey Lake, 39 miles.

NIAGARA, WELLAND AND LAKE ERIE RY. April 26. In town of Welland, Ont., and vicinity.

PACIFIC AND HUDSON BAY RY.—April 26. Kimsquit to Natalkus Lake, about 110 miles.

Canadian Railway Club.

The following officers were elected at the annual meeting in Montreal recently:—

PRESIDENT, J. Coleman, Supt. Car Dept., G.T.R.; FIRST VICE PRESIDENT, R. W. Burnett, General Master Car Builder, C.P.R.; SECOND VICE PRESIDENT, W. McNab, Principal Asst. Engineer, G.T.R.

EXECUTIVE COMMITTEE, D. Crombie, Assistant to General Transportation Manager, G.T.R.; C. Murphy, General Superintendent of Transportation, C.P.R.; R. M. Hannaford, Assistant Chief Engineer, Montreal Tramways Co.; G. I. Evans, Mechanical Engineer. C.P.R.; J. A. Isherwood, Prof. Keay, McGill University.

AUDIT COMMITTEE, E. B. Tilt, Engineer of Tests, C.P.R.; J. A. Duffie, Chief Clerk, Master Mechanic, G.T.R.; W. Robb, Canuck Supply Company.

SECRETARY, J. Powell, Chief Draughtsman, G.T.R.; TREASURER, W. H. Stewart, Chief Clerk to Assistant to Vice President, C.P.R.

Recent Dominion Legislation.

The following acts affecting transportation interests, in addition to those given on pg. — of our ——— issue, were passed at the Dominion Parliament's recent session:—

ALABAMA TRACTION, LIGHT AND POWER CO.—Incorporation.

ALBERTA, PEACE RIVER AND EASTERN RY.—Extension of time for construction.

BRITISH COLUMBIA AND DAWSON RY.—Extension of line for construction.

CANADA SHIPPING ACT.—Amending act.

CANADIAN NORTHERN RY.—Extending time for construction of certain lines. and authorizing building of additional branches.

CANADIAN NORTHERN ALBERTA RY.—An act to aid construction of the line, and a second act with respect to aid granted.

CANADIAN NORTHERN MONTREAL TUNNEL AND TERMINAL CO.—Respecting company's powers.

CANADIAN NORTHERN PACIFIC RY.—Granting subsidy in aid of construction.

CANADIAN PACIFIC RY.—Granting extension of time for construction of certain lines, etc.

DRY DOCKS.—Amending act granting subsidies in aid of building dry docks.

ESQUIMALT AND NANAIMO RY.—Extending time for building certain lines, and authorizing building of additional lines.

GATINEAU AND UNGAVA RY.—Extending time for construction and changing company's title to Ottawa and Ungava Ry.

GRAND TRUNK RY.—Respecting company's finances.

HAMILTON, ONT.—Providing for appointment of harbor commissioners.

KOOTENAY CENTRAL RY.—Extending time for construction.

KETTLE VALLEY RY.—Extending time for construction and authorizing building of additional lines.

MANITOBA AND NORTH WESTERN RY.—Extending time for construction, etc.

MEXICAN INTERURBAN ELECTRIC TRACTION CO.—Changing name to Mexican Interurban Electric Ry., etc.

MEXICO NORTH WESTERN TRANSPJRTATION CO.—Changing name to Mexican North Western Pacific Ry.

MONTREAL HARBOR.—Authorizing additional advances to Montreal Harbor Commission.

MONTREAL AND LAKE VICTORIA RY.—Incorporation.

MONTREAL CENTRAL TERMINAL CO.—Two acts amending powers.

MONTREAL, OTTAWA AND GEORGIAN BAY CANAL CO.—Extending time for construction.

ONTARIO AND OTTAWA RY.—Amending powers.

OTTAWA AND LAKE MCGREGOR RY.—Act of incorporation, and a second act amending powers.

OTTAWA, BROCKVILLE AND ST. LAWRENCE RY.—Extending time for construction.

OTTAWA, MONTREAL AND EASTERN RY.—Two acts amending powers.

PACIFIC, TRANS-CANADA AND HUDSON BAY RY.—Incorporation.

PRINCE EDWARD AND HASTINGS RY.—Incorporation.

QUINZE RIVER AND OTTAWA RY.—Incorporation.

RAILWAYS AND BRIDGES.—Granting subsidies in aid of construction.

RAINY RIVER RADIAL RY.—Extending time for construction.

REVILLON FRIRES TRADING CO.—Amending powers.

ST. CLAIR AND ERIE SHIP CANAL CO.—Extending time for construction.

ST. JOHN AND QUEBEC RY.—Granting aid towards construction of bridges, and confirming agreement with the Province of New Brunswick regarding construction and operation of railway.

SASKATCHEWAN CENTRAL RY.—Extending time for construction.

SASKATCHEWAN POWER CO.—Confirming charter.

TEMISKAMING AND NORTKERN ONTARIO RY.—Confirming agreement with G.T.R. for running rights.

UNITED GOLD FIELDS OF B.C.—Extending time for building authorized railway, etc.

VANCOUVER, FRASER VALLEY AND SOUTHERN RY.—Extending time for construction, etc.

WESTERN DOMINION RY.—Incorporation.

WINDSOR, CHATHAM AND LONDON RY.—Amending powers.

WINNIPEG AND ST. BONIFACE, MAN.—Incorporating harbor commissioners for district.

Joliette and Lake Manuan Colonization Railway.

In reference to the article on this line published in our last issue we are officially advised that A. M. Laredo purchased his three fourths interest in the charter, July 26, 1911.

We are also officially advised that the company has 30 miles of line located northerly from Joliette passing through the villages of St. Felix de Valois, St. Jean de Matha, and Ste. Emelie de L'Energie, and four miles north of the latter place into the Laurentian Mountains. From Ste. Emelie de L'Energie to St. Zenon, 12 miles, this being the mountain section and chiefly rock. From St. Zenon to St. Michel des Saints the line passes through a good farming section. St. Michel des Saints is a flourishing village established 52 years ago and situate 60 miles north of Joliette. From St. Michel des Saints to Waymontachene on the National Transcontinental Railway, 90 miles, the line follows contiguous to fine water stretches, and large lakes passing through the virgin forest with a wealth of lumber, magnificent scenery and ideal summer resorts, with excellent hunting, shooting and fishing. There is an abundance of lumber and pulp wood, with good agricultural land. The line when completed will also serve the following villages contiguous to it on each side, namely:—St. Ambrose, de Kildare, Radstock, St. Melanie, Ste. Beatrix, St. Alphonse, St. Come, St. Damien, and St. Ignace. With the advent of the railway, other parishes will be opened up between St. Michel des Saints and Waymontachene. There are at present several saw mills and creameries in operation along the line, besides a large pulp and paper mill up north. Contiguous to the line are deposits of white marble, asbestos, mica and iron, with large quantities of sand and gravel.

The general route map for the whole distance to the N.T. Ry. has been approved by the Minister of Railways; plans and profiles for the first 30 miles have been sent to Ottawa and the remainder of the line is being surveyed as rapidly as possible. The contractors for the first 60 miles are the Enterprise Construction Co. of New York and Ottawa, with headquarters at St. Felix de Valois, P.Q. The contractors intend covering the first 30 miles shortly with men, teams and other plant between Joliette and Ste. Emelie de L'Energie, in order to reach the latter place as expeditiously as possible with the track.

The track will be laid with 80 lb. rails instead of 65 lb. as originally intended. Considerable ties were taken out during the past winter. The line is expected to be completed before the National Transcontinental Ry. is connected up. The ruling gradient on the first 30 miles is 1 ft. per 100 ft. for 1½ miles; otherwise the gradient does not exceed 0.65 per 100 ft. From miles 30 to 42, mountain section, the ruling gradient is 1.50 per 100 ft. for short distances, with easy gradients at intervals between the 1.50 per 100 ft. grade. North it is not expected to exceed 0.50 per 100 ft. The maximum curvature is 8°. At mile 20.5 the Black River is spanned with 2 half deck plate girders of 55 ft. each, with concrete abutments and one pier.

J. N. Patton, M. Can. Soc. C.E., is Chief Engineer, and H. S. Dickson, Division Engineer, both with headquarters at St. Felix de Valois, Que.

Canadian Northern Railway Earnings, Expenses, Etc.

Gross earnings, working expenses, net profits, increases or decreases, compared with those for 1910-11, from July 1, 1911:—

	Earnings.	Expenses.	Net Earnings.	Net Increase
July	$1,475,900	$1,114,300	$361,600	$13,400
Aug.	1,420,600	1,105,900	314,700	51,700
Sept.	1,576,400	1,157,000	419,400	38,200
Oct.	2,028,900	1,348,500	680,400	99,900
Nov.	2,001,500	1,336,300	665,200	106.300
Dec.	1,831,400	1,327,600	503,800	144,600
Jan.	1,223,100	1,004,400	223,706	122,000
Feb.	1,203,400	965,800	237,600	101,800
Mar.	1,572,700	1,145,900	426,800	72,000
	$14,338,900	$10,505,700	$3,833,200	$749,900
Inc.	$ 3,396,000	$2,646,100	$ 749,900	.....

Approximate gross earnings for April, $1,608,100, against $1,345,400 for April, 1911.

The mileage in operation during April, was 3,981 against 3,386 in April, 1911.

Canadian Pacific Railway Earnings, Expenses, Etc.

Gross earnings, working expenses, net profits, increases or decreases, compared with those for 1910-11, from July 1, 1911:

	Earnings.	Expenses.	Net Profits.	Net Increases.
July	$ 9,661,818.14	$5,958,789.81	$3,703,028.33	$218,408.74
Aug.	10,421,904.42	6,346,333.41	4,075,571.01	383,898.68
Sept.	10,049,084.97	6,131,638.17	3,917,446.80	5,847.16
Oct.	11,207,991.99	6,526,887.24	4,631,104.75	175,944.23
Nov.	10,570,694.80	6,583,328.31	3,987,366.46	250,244.23
Dec.	10,654,871.67	6,649,141.41	4,105,730.26	819,196.37
Jan.	7,328,781.81	6,245,924.11	1,082,857.70	426,739.83
Feb.	8,931,907.20	6,548,040.53	2,338,866.67	1,239,159.16
Mar.	10,519,328.76	6,800,317.65	2,718,401.11	561,834.57
	$89,346,373.76	$57,691,000.64	$31,655,373.12	$4,081,272.97
Inc.	12,642,297.62	$8,561,024.65	$ 4,081,272.97	....

Approximate gross earnings for April, [$11,028,000. against $8,458,000 for April, 1911.

The mileage operated during April was increased to 10,981.

Grand Trunk Railway Earnings, Expenses. Etc.

Following are the earnings of the G.T.R., C.A.R., G.T. Western Ry., and D.G.H. and M. Ry., for March, as compared with those for March, 1911:—

GRAND TRUNK RAILWAY.

	1912.	1911.
Earnings	$3,206,700	$3,077,353
Expenses	2,403,200	2,181,760
Net earnings	$ 803,500	$ 895,593

CANADA ATLANTIC RAILWAY.

	1912.	1911.
Earnings	$168,500	$173,359
Expenses	152,200	143,665
Net earnings	$ 16,300	$ 30,194

GRAND TRUNK WESTERN RAILWAY.

	1912.	1911.
Earnings	$540,700	$529,856
Expenses	509,900	451,449
Net earnings	$ 30,800	$ 78,407

DETROIT, GRAND HAVEN AND MILWAUKEE RY.

	1912.	1911.
Earnings	$164,300	$147,074
Expenses	174,100	160,223
Deficit	$ 9,800	$ 13,149

TRAFFIC RECEIPTS OF THE SYSTEM.

Aggregate from Jan. 1 to Apr. 30:—			
G.T.R.	$11,500,189	$10,727,821	$772,368
C.A.R.	639,027	611,643	27.384
G.T.W.R.	2,118,952	2,161,647	*42,695
D.G.H. & M.R.	650,598	650,106	492
Totals	$14,908,766	$14,151,217	$757,549

* Decrease.

St. John and Quebec Railway Construction.

The entire plans for the projected railway provide for a line from St. John, N.B., to Quebec, passing through Maine, and giving, it is claimed, the shortest and most direct connection. The plan is divided up into three sections, and includes the line known as the St. John Valley Ry., the Aroostook Valley Electric Ry. in Maine, and the old Quebec and New Brunswick Ry. in Quebec.

The first section of the line is in New Brunswick and extends from St. John along the St. John River Valley to Grand Falls. The contract for its construction has been arranged between the New Brunswick and Dominion Government, and has been let to the St. J. and Q. Ry. Co., which will sublet it to construction companies. The plans for the line from St. John to Grand Falls show that the starting point of construction will be from a junction with the Intercolonial Ry. at Rothesay, thence across the Kennebecasis River, and the St. John River to Hampstead tp. Thence the route follows the windings of the river, keeping on the south bank to Northampton, where it bends away towards the International boundary, returning close to the bank in Andover tp., and on to Andover.

The New Brunswick Government aids the construction by a guarantee of bonds of $25,000 a mile, and the Dominion Parliament has voted a subsidy of $3,200 a mile, but which may be increased to $6,400 a mile, in proportion as the cost of construction exceeds $15,000 a mile. The Dominion Parliament has also voted $1,000,000 towards building three bridges on the line, viz.:—one across the Kennebecasis River at Perry Point, one across the St. John River at the Mistake, and the third across the St. John River near Andover. The Dominion Government has also arranged to lease the line, as soon as it is completed, for 99 years, to operate it as part of the Intercolonial Ry., and to pay 40% of the gross earnings. The agreement provides that the rental shall be used for the retirement of the bonds issued with the provincial guarantee, and that any surplus shall be paid to the company for 15 years, after which the money is to be used to meet the interest and principal of the bridge bonds, and any balance to be paid to the company.

The agreement with the Dominion Government provides that the bridges shall be built by a separate company, and the New Brunswick Legislature has under consideration a measure incorporating the St. John and Quebec Bridge Co., with A. R. Gould, President, St. J. and Q. Ry., as its principal promoter. Other legislation to carry out the agreement between the two Governments and the company is pending in New Brunswick.

The second section of the line is being proposed to be built under the charter the Aroostook Valley Electric Ry., incorporated in the State of Maine. This provides that the company may acquire the C.P.R. Aroostook branch, terminating at Presque Ile, Me., and connect it with the electric railway running from that town to Washburn, about nine miles. The company proposes to build branches from Washburn northerly to Caribou and into New Sweden tp. The line to the Quebec boundary leaves Washburn, follows the valley of the Little Salmon River, crosses the Fort Kent branch of the Aroostook Valley Ry. and proceeds westerly to the Allagash River, at the boundary between tps. 14, ranges 11 and 12, the St. John River in tp. 15, range 13, and reaches the International boundary between Maine and Quebec, in tp. 14, range 16.

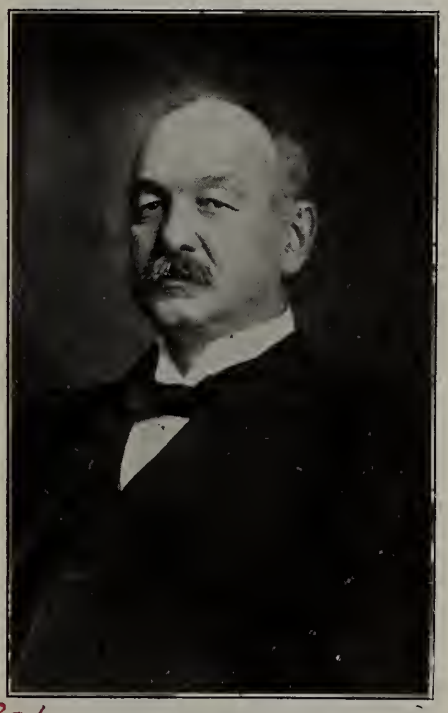
The third section runs from the International boundary to the Intercolonial Ry., the plan showing that the surveyed route passes through Casgraine, (in which the line crosses the National Transcontinental Ry.), Bourdages and St. Clair tps. to Montmagny station.

We are officially advised that contracts for grading, track laying and ballasting have been let as follows:—Fredericton to Woodstock, 62 miles, Quebec Construction Co., Montreal; Woodstock to Centreville, 23 miles, Kennedy and McDonald, Antigonish, N.S. It is reported that a further contract has been let to J. H. Corbett.

A prospectus was issued in London, Eng., May 10, by the St. J. and Q.R. Co., through the Bank of Montreal, offering £873,285 1st mortgage 4% debenture stock, unconditionally guaranteed as to both principal and interest by the New Brunswick Government, the price of issue being 98½%.

The Death of James Oborne.

Just after The Railway and Marine World's last issue had gone to press came the unexpected news of the death of Jas. Oborne, General Superintendent, British Columbia Division,



P260 The late James Oborne.

C.P.R., which occurred at his home in Vancouver on May 1.

When a change in the B.C. General Superintendency was decided on early in the year, Vice President and General Manager Bury selected Mr. Oborne for the position, personally visiting Toronto and offering him what is undoubtedly the blue ribbon of the company's general superintendencies, owing to the fact that a general superintendent at Vancouver has so many duties to perform in addition to mere operation and maintenance, and that additional responsibility is thrown on him by the remoteness of his location from headquarters. With the great development going on in British Columbia, and the important changes which will follow the opening of the Panama Canal, the position of General Superintendent at Vancouver is of more than usual importance, and it was given to Mr. Oborne, not because he was the senior general superintendent in the service, but more particularly on account of his peculiar fitness for it, his great capacity for work, and his indomitable devotion to the company's interests.

He only arrived at Vancouver on February 15, and had just got settled in a beautiful home on Shaughnessy Heights, entering on his work with characteristic ardor and being most enthusiastic about it. In a personal letter to the Managing Director of The Railway and Marine World, written a few weeks before his death, he said:—"We have had delightful weather since our arrival here, and I like the country, its people, and the work very much. The development is marvellous."

Towards the end of April Mr. Oborne went all over the division on an inspection trip, during which he caught a severe cold. Returning to Vancouver on April 27, he at once went to bed, but no serious results were feared, until erysipelas set in and he failed rapidly, dying on May 1.

His body left Vancouver on the following day on his private car, which was attached to the Montreal express, accompanied by Mrs. Oborne, his younger son and three daughters, the older son being resident in Toronto. The funeral took place in Montreal May 6, a large number of the company's officials and others attending. The body was cremated at Mount Royal cemetery, in accordance with his expressed wish.

Mr. Oborne was born at Montreal, Sept. 19, 1861, and entered railway service Oct., 1874, since when he was, to Aug., 1877, junior clerk, Mechanical Superintendent's office, G.T.R.; Sept., 1877, to July, 1883, chief clerk, Works Manager's office, G.T.R.; July, 1883, to June, 1886, chief clerk, Mechanical Superintendent's office, C.P.R.; June, 1886, to Sept., 1887, chief clerk, Assistant General Manager's office, C.P.R.; Sept., 1887, to Apr., 1890, Car Accountant, C.P.R.. Apr., 1892, to Apr., 1896, Superintendent Car and Fuel Service, C.P.R.; Apr., 1896, to Mar., 1899, Assistant to Vice President, C.P.R.; Mar., 1899, to May, 1901, General Superintendent, Western Division, C.P.R., Winnipeg; May, 1901, to May, 1903, General Superintendent, Atlantic Division, C.P.R., St. John, N.B.; May, 1903, to Dec., 1906, General Superintendent, Eastern Division, C.P.R., Montreal; Dec., 1906, to Feb., 1912, General Superintendent, Ontario Division, C.P.R., Toronto. Feb. 1 to May, 1912, General Superintendent, British Columbia Division, C.P.R. He was President of the International Association of Car Service Officers for 1895-96.

C.P.R. Irrigation Work Contracts.

A. S. Dawson, M. Can. Soc. C.E., Chief Engineer, Department of Natural Resources, C.P.R., reports the awarding of three large contracts in connection with construction in the eastern section of the company's irrigation block.

Grant Smith and Co. and McDonnell, of Vancouver, have been given a contract running into over $500,000, for the construction of a large reinforced concrete aqueduct, two miles long, near Brooks, Alta., which will take the next two summers to complete.

Janse Bros. and Boomer and Hughes, of Calgary, Alta., and Seattle, Wash., have been given a two year contract, amounting to about $300,000, for the construction of a very large number of reinforced concrete structures on the canal system in the section of the irrigation block lying between Bassano and Brooks, Alta., and the Bow and Red Deer rivers.

The Canada Foundry Co. has been given a contract for supplying and erecting 30 steel bridges over the main canal system, containing about 1,500,000 lbs. of steel, which, with masonry abutments, will provide practically permanent structures.

Work on all of these contracts will be commenced in the immediate future, and several hundred men, large numbers of teams and an elaborate construction plant will be required for their completion.

Grade Separation in North Toronto.

The plans for the construction of the Canadian Northern Ry. line across North Toronto are bound up with the question of the separation of the grades, with which the C.P.R. is also concerned. The C.P.R. was originally across the north portion of Toronto, and access was finally obtained into the Union Station by a line from Leaside Jct., thence over the old Credit Valley Ry., or the old Toronto, Grey and Bruce Ry. to Toronto Jct, now West Toronto. The section of line from Leaside Jct. to Toronto Jct. has always been used for freight traffic, and recently it has also been used for certain passenger trains. The extension of traffic necessitated changes, and, in conjunction with the city council, plans were discussed for the elimination of level crossings.

The coming of the Canadian Northern Ry. altered the situation. The C.N.R. proposed to run a line from near Leaside across the Don Valley to Davenport road, and there connect up with the right of way which it had acquired from the Electric Development Co. After considerable negotiations and discussion between the several interests, and before the Board of Railway Commissioners, the two railways agreed upon a plan for the construction of joint tracks from Yonge St. to Avenue Road, with a joint station. This arrangement has been approved of by the Board of Railway Commissioners, with the understanding that the plans for the subways on Yonge St. and Avenue Road be submitted to the board. The C.P.R., it is said, will carry out the joint section of the work, and it is stated a start is to be made at once.

The question of what would be done west of Avenue road was discussed at great length, and finally a compromise plan was prepared by G. A. Mountain, Chief Engineer for the board. This plan, which has been accepted by the railways and the city, has been approved by the board. It provides for the elevation of the tracks from the end of the Avenue road section, westerly to Dovercourt road, whence they approach the level on a descent of 0.5%. Davenport road and Poplar Plains road are to be deflected into one subway, and Huron street is to be closed. Provision is made for approaches to 18 industrial spurs. Most of these spurs will be on a 2% gradient, while one will have a 3% gradient.

Toronto Viaduct and Union Station.

The Board of Railway Commissioners, sitting at Toronto May 24 approved of the G.T.R. plans for a viaduct along the Toronto water front and for a new union station on Front St., between York and Bay Streets, and rejected the plans submitted by the C.P.R. and by the Board of Trade. The Vice Chairman of the Board of Railway Commissioners stated that work must proceed at once, and Chief Engineer Safford of the G.T.R., said his company was willing to rush the work as much as possible, but he thought it would take three years to complete it.

The G.T.R. plans provide for a station with ten through tracks and no stub tracks. The station building will be 3½ or possibly four stories high and is expected to cost $2,500,000, which is to be borne by the C.P.R., the G.T.R., and the Canadian Northern Ry. The cost of the viaduct is estimated at $6,500,000, of which the city is to contribute a third.

H. A. Everett, President London, Ont., St. Ry., is reported to be in poor health, but it was denied, May 17, that as a consequence he had resigned the presidency.

The Death of Chief Commissioner Mabee.

Closely following the tragic death of C. M. Hays, and the short fatal illness of James Oborne, the public were further shocked early in May by the death of James Pitt Mabee, Chairman of the Board of Railway Commissioners.

Mr. Mabee was taken ill on April 30, while presiding at a sitting of the board in Toronto. That evening he went to St. Michael's Hospital, his own physician, and a surgeon who was called in, recommending an operation for appendicitis. At first he was rather opposed to having it done, but consented early the following morning, when it was performed, and it was found that gangrene had set in. Two days later a second operation became necessary to relieve paralysis of the bowel, due to the gangrene condition. This, however,

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The late J. P. Mabee.

was also unavailing, and he died on May 6, following a collapse due to heart failure.

His death, the news of which was received with the greatest regret throughout the entire country, was followed by the most unanimous expression by public men and the press in regard to his ability, to the great services he had rendered Canada, and to his fairness to the various conflicting interests. He was buried May 8 at his birthplace, Port Rowan, Ont., the body being taken from Toronto on a special train, accompanied by a large number of prominent public men, railway officials, etc.

He was born at Port Rowan, Ont., Nov. 5, 1859, and was educated at the Port Rowan high school, and matriculated, Nov., 1877. He was called to the Ontario Bar, Nov., 1882, and from 1882 to 1887, practised at Listowel, Ont., and from 1887 to Jan. 1, 1905, at Stratford, Ont. From Jan. to Nov., 1905, he practised at Toronto, as a member of the firm of Beatty, Blackstock and Co., during which time he was Chairman of the Canadian section of the International Waterways Commission. He retired from private practice, and resigned the chairmanship mentioned, Nov., 1905, on his appointment as a Justice of the High Court of Ontario. From Mar., 1906, to Mar., 1908, he was a member of the Statute Revision Committee, and on Mar. 21, 1908, was appointed Chairman of the Board of Railway Commissioners.

Mr. Mabee, who was a widower, left a young son and daughter.

C.P.R. Mechanical Conference.

A conference of officials of the C.P.R. Mechanical Department was held at Angus shops, Montreal, May 6 to 8, H. H. Vaughan, Assistant to the Vice President, presiding, the others present being C. H. Temple, Superintendent of Motive Power and Car Department, Western lines, Winnipeg; R. W. Burnett, General Master Car Builder, Montreal; C. Kyle, General Master Mechanic, Eastern lines, Montreal; H. Osborne, Superintendent Locomotive Shops, Montreal; G. I. Evans, Mechanical Engineer, Montreal; J. Burns, Master Mechanic, Montreal; C. C. Ord, Master Mechanic, McAdam Jct., N.B.; H. G. Reid, Master Mechanic, North Bay, Ont.; A. Dixon, General Foreman, Locomotive Shops, West Toronto; S. Phipps, Master Mechanic, Vancouver; R. Preston, Master Mechanic, Winnipeg; A. T. Shortt, Master Mechanic, Calgary, Alta.

A large number of questions were thoroughly discussed. A dining car was placed near the shops to serve luncheon for those attending the conference, and at its conclusion a dinner was held held at the Engineers' Club, Montreal, H. H. Vaughan, president of the club, occupying the chair. A visit was paid to the Montreal Locomotive Works.

Western Canada Railway Club.—At the recent annual meeting in Winnipeg, the following officers and committees were elected for the current year:—President, S. J. Hungerford, Superintendent of Rolling Stock, Canadian Northern Ry.; Vice President, T. Duff Smith, Fuel Agent. G.T. Pacific Ry.; Secretary, W. H. Rosevear; Treasurer, E. Humphrey; Executive Committee, R. R. Neild, J. G. Legrand, A. McCowan, L. O. Genest, A. H. Eager, L. Kon, W. Carter; Audit Committee, W. S. Fallis, E. O. Balleine and J. B. Parker.

Embargos Against Traffic.—The Board of Railway Commissioners has called on railway companies to show cause at the sittings at Ottawa, June 18, why an order should not be made prohibiting any railway company from issuing an embargo against any traffic for longer than four days without first giving the board at least 10 days previous notice of its intention to issue such embargo, and the reason why such embargo is to be issued.

A Winnipeg press report states that the G. T. Pacific Ry. is about to start operating a passenger train service between Winnipeg and Fort William, Ont.

The Railway Storekeepers' Association held its ninth annual convention at Buffalo, N.Y., May 20 to 22, when, among the subjects dealt with, was that of line inspection, by J. H. Callaghan, General Storekeeper, C.P.R., Montreal.

The Michigan Central Rd. was fined $10,000, May 9, in the U.S. District Court at Chicago, for violation of the laws against rebating. The company pleaded guilty to the charge, which was stated to have been carried on under the guise of advertising theatrical companies. An indictment against W. H. Underwood, Assistant General Passenger Agent, M.C. Rd., Chicago, Ill., in the same connection, was quashed.

Appointment of President Grand Trunk Ry. and Grand Trunk Pacific Ry.

A. W. Smithers, chairman of the Board, G.T.R., arrived in New York, May 17, on the s.s. Mauretania, from England, and was met by W. Wainwright, Vice President, who has had chief charge of the company's affairs since C. M. Hays' death, and by D. E. Galloway, assistant to the president. After spending a day or two in New York, Mr. Smithers proceeded to Montreal and visited Ottawa. and on May 24 announced that E. J. Chamberlin, Vice President and General Manager G.T.P.R., had been appointed President of both the G.T.R. and G.T.P.R., to succeed Mr. Hays, and had also been elected a member of the G.T.R. board. At the same time it was announced that W. Wainwright, heretofore Second Vice President G.T.P.R., had been appointed First Vice President, and M. M. Reynolds, heretofore Third Vice President, had been appointed Second Vice President, and also a director.

Mr. Smithers also gave out the following statement:—"In making the announcement with regard to the late Mr. Hays' successor, the chairman wishes to take the opportunity of congratulating the Vice President, W. Wainwright, on the completion of his 50 years' connection with the company, during which time he has continuously rendered important and faithful service, and the chairman desires to especially recognize the readiness with which, at his request, Mr. Wainwright handled the company's affairs in the circumstances arising from the lamented death of Mr. Hays. The chairman is pleased to announce that the board has made certain arrangements with Mr. Wainwright in recognition of his valuable services which Mr. Wainwright informs the chairman have given him great pleasure and gratification."

E. J. Chamberlin was born in 1852 at Lancaster, N.H., and entered railway service in 1871, since when he has been consecutively, to 1872, timekeeper in car shops, Central Vermont Rd.; 1872 to 1875, clerk in Paymaster and Superintendent of Transportation's office, same road; 1875 to 1876,. corresponding secretary to General Superintendent, same road; 1877 to 1884, private secretary to General Manager, same road, St. Albans, Vt.; Apr., 1884, to Sept., 1886, Superintendent, Ogdensburg and Lake Champlain Rd., and Central Vermont Line steamships running between Chicago and Ogdensburg; Sept. 1, 1886, to Oct., 1905, General Manager, Canada Atlantic Ry. After the absorption of the C.A.R. by the G.T.R. he was connected with lumber, contracting and mining interests for some years, and on Jan. 25, 1909, was appointed Vice President and General Manager, Grand Trunk Pacific Ry., on the resignation of F. W. Morse.

The events of the past few weeks have shown the utter unreliability of much of the so called "news" published in the daily papers. On May 3 evening papers published a Canadian Press dispatch from London, Eng., stating that Sir Thos. Tait had that day been chosen to succeed the late C. M. Hays. Sir Thos. Tait was at the time in New Brunswick, in connection with the construction of the Fredericton and Grand Lake Ry., of which he is president, and on returning to Montreal stated that he knew nothing whatever about the matter. It would appear that there was no foundation for the dispatch quoted, and that it was probably manufactured.

On May 15 the Toronto Globe announced, under flaring head lines, that Hon. G. P. Graham, M.P., ex-Minister of Railways and Canals, had been offered the position, and added:—"Mr. Smithers is now on his way to Canada to consult with Mr. Graham as to the vacancy."

Mr. Graham, who was in Ottawa that day, is reported to have stated to a press

P276 E. J. Chamberlin,
President, Grand Trunk Railway and Grand Trunk Pacific Railway.

representative that there was no truth in the report, and that the presidency had not been offered to him.

On arrival at New York Mr. Smithers is reported as saying:—"The use of certain names in connection with the presidency was absolutely unauthorized. By unauthorized I mean not only that no officer of the G.T.R. has given out any statement tending to show that any person was likely to get the appointment, but I mean that even the facts did not authorize any announcement."

P277 W. Wainwright,
Vice President, Grand Trunk Railway, and First Vice President, Grand Trunk Pacific Railway.

Such positive announcements in the daily papers as those above quoted, following so closely after the sheaf of bogus news and alleged dispatches published at the time of the Titanic disaster, naturally cause a feeling of distrust of any "news" published, and the publishers of reputable papers should take steps to prevent a repetition of such frauds on the public. The announcement that Sir Thos. Tait had been appointed was not given even as a report, or rumor, but on the authority of a Canadian Press dispatch. If the management of that association does not deal with the member of its staff who sent the bogus news, the daily paper publishers should take the matter up.

The announcement that Mr. Graham had been offered the position was made positively by the Toronto Globe on its own authority, and was followed by a lengthy eulogy of him. It would appear to have been a pure invention, and as apparently it was not subsequently corrected in any way, except by a press dispatch from Montreal saying that G.T.R. officials there did not credit it, the Globe must assume full responsibility for it. What was the object of publishing such a statement? Was it simply to create a sensation for the day, or was it a deliberate attempt to boom Mr. Graham for the position? The incident tends to throw a doubt on newspaper statements generally, and to justify the inference that some of them are edited without any regard for the truth of the matter they publish.

Operation of U.S. Trains in Manitoba by U.S. Crews.

Under an agreement between the Canadian Northern Ry. and the Midland Ry. of Manitoba, the latter a subsidiary of the Great Northern Ry. (U.S.A.), the Great Northern and the Northern Pacific Rys. started on May 1 operating their trains from the international boundary to Fort Garry union station, Winnipeg, with United States crews, having their headquarters at Crookeston, Minn. Previously the trains had been brought in by C.N.R. crews. The alteration led to difficulties, the C.N.R. men protesting at being removed to other runs, and against the operation of trains in Canada by U.S. crews. The Department of Labor was advised and steps taken to appoint a conciliation board. It was reported May 12 that an arrangement had been reached between the two companies, but the C.N.R. men demanded to be reinstated in their old positions. On May 15, the Board of Railway Commissioners issued an order preventing the C.N. Ry. and the Midland Ry. of Manitoba, under a penalty of $100 a day, carrying out any of the provisions between them after May 20, unless and until it received the sanction of the Governor-in-Council on the Board's recommendation. Sir W. Mackenzie, President C.N.R., arrived in Winnipeg, May 15, and discussed the matter with the various interests. As a result the situation as it existed prior to May 1 was restored, and the G.N. Ry. and N.P. Ry trains between the boundary and Winnipeg are being operated by Canadian crews, though it is said the latter have become employes of the Midland Ry. of Manitoba.

The question of the future operation of the trains into Winnipeg will be discussed later on by the officials of the different lines, and will also come up again before the Board of Railway Commissioners.

Birthdays of Transportation Men in June.

Many happy returns of the day to—

Jas. Anderson, Manager, Sandwich, Windsor and Amherstburg Ry., Windsor, Ont., and President, Canadian Street Railway Association, born at Ayr, Ont., June 20, 1851.

W. C. Bowles, General Freight Agent, Western Lines, C.P.R., Winnipeg, born at Montreal, June 3, 1875.

J. H. Boyle, Assistant Superintendent, District 4, Eastern Division, C.P.R., Ottawa, born at Waterloo. Que., June 26, 1869.

F. P. Brady, Member, Government Railways Managing Board, and General Superintendent, Government Railways, Moncton, N.B., born at Haverhill, N.H., June 22, 1853.

H. W. Brodie, General Passenger Agent, Lines West of Revelstoke, C.P.R., Vancouver, B.C., born at Fredericton, N.B., June 8, 1874.

A. H. N. Bruce, M. Can. Soc. C.E., Chief Engineer, Quebec and Saguenay Ry., Quebec Ry., Light, Heat and Power Co., etc., Quebec, Que, born at Ballyscullion, Ireland, June 18, 1854.

A. E. Doucet, M. Can. Soc. C.E., District Engineer, National Transcontinental Ry., Quebec, born at Montreal, June 9, 1860.

E. W. DuVal, Superintendent, District 4, Manitoba Division, C.P.R., Souris, born at Toledo, Ohio, June 5, 1885.

G. H. Eaton, Assistant Master Car Builder, Western Lines, C.P.R., Winnipeg, born in Staffordshire, Eng., June 9, 1860.

J. M. R. Fairbairn, M. Can. Soc. C.E., Assistant Chief Engineer, Eastern Lines. C.P.R., Montreal, born at Peterboro, Ont., June 30, 1873.

A. A. Goodchild, Auditor of Stores and Mechanical Accounts, C.P.R., Montreal, born at Peckham, London, Eng., June 3, 1866.

J. A. Heaman, Division Engineer, G.T. Pacific Ry., Fitzhugh, Alta., born at Memphis, Tenn., June 3, 1874.

H. W. Harding, Local Secretary, Canadian Northern Ry., London, Eng., born there June 6, 1869.

Hon. J. D. Hazen, M.P., Minister of Marine, Ottawa, born at Oromocto, N.B., June 6, 1860.

L. R. Johnson, Assistant Superintendent Motive Power, C.P.R. Eastern Lines, Montreal, born at Abingdon, Berks, Eng., June 22, 1855.

L. K. Jones, I.S.O., Assistant Deputy Minister and Secretary, Department of Railways and Canals, Ottawa, born at Port Hope, Ont., June 9, 1849.

A. C. Lytle, Assistant Superintendent of Construction, Montreal Tramways Co., Montreal, born at Hemmingford. Que., June 6, 1854.

R. S. McCormick. M. Am. Soc. C.E., Chief Engineer, Algoma Central and Hudson Bay Ry. and Algoma Eastern Ry., Sault Ste. Marie, Ont., born at Quaker City, Ohio, June 22, 1873.

D. McDonald, General Manager, Montreal Tramways Co., born at St. Thomas de Montmagny. Que., June 17, 1859.

S. J. McLean, Dominion Railway Commissioner, Ottawa, born at Quebec, June 14, 1871.

J. V. McNab, Resident Engineer, C.P.R., Saskatoon, Sask., born at Ayr, Ont., June 11, 1884.

C. E. McPherson, Assistant Passenger Traffic Manager, Western Lines, C.P.R., Winnipeg, born at Chatham, Ont., June 7, 1861.

W. R. MacInnes, Freight Traffic Manager, C.P.R., Montreal, born at Hamilton, Ont., June 7, 1867.

H. J. Maguire, District Baggage Agent, Pacific Division and B.C. and Pacific Coast Service, C.P.R., Vancouver, B.C., born at Toronto, June 16, 1881.

G. Manson, Assistant to Vice President C.P.R., Winnipeg, born at Thurso, Scotland, June 8, 1863.

J. D. Morton, Assistant Comptroller. Canadian Northern Ry., Toronto, born at London, Ont., June 15, 1857.

L. Mulkern, District Freight Agent, C.P.R., London, Ont., born there, June 18, 1871.

H. A. Pepler, District Master Mechanic, C.P.R., Montreal, born at Richmond, Que., June 25, 1873.

F. Price, Superintendent Car Service, G.T.R., Montreal, born there June 11, 1864.

Allan Purvis, Manager of Interurban Lines, British Columbia Electric Ry., New Westminster, B.C., born at Batavia, Java, June 29, 1864.

D. I. Roberts, General Manager, Quebec, Montreal and Southern Ry., and Napierville Jct. Ry., Montreal, born at Waynesburg, Pa., June 27, 1853.

Jas. Stephenson, ex Chief Superintendent, G.T.R., now of Clevedon, Somerset, Eng., born at Weston Super Mare, Eng., June 2, 1837.

W. Webber, General Agent Passenger Department Atlantic Steamship Service. C.P.R., Montreal, born at Liverpool. Eng., June 10, 1872.

Around the World by C.P.R. and Trans-Siberian Ry.

The C.P.R. has made arrangements by which it can now sell around the world tickets over the Trans-Siberian Ry., connection being made by its Trans-Pacific steamships at Yokohama, Kobe, Nagasaki and Shanghai, with the various routes of the Trans-Siberian. At fares varying according to route, passengers may leave the C.P.R. steamships at Yokohama or Kobe, travel by Japanese railway to Tsuruga on the north coast of Japan, thence by steamer to Vladivostock, where the Trans-Siberian rails begin, or they can go by rail from Yokohama or Kobe to Shimonoseki, and take steamer to Dairen (Dalny), close to historic Port Arthur, and then begin the rail journey, joining the main line of the Trans-Siberian at Kharbin, or, leaving the C.P.R. at Nagasaki, they may take the Japanese railway to Moji, and then steamer to Dalny, or, again, they may use the C.P.R. ships to Nagasaki or Shanghai, and steamer direct from either of these ports to Vladivostock.

T. E. McNair, City Passenger Agent, C.P.R., Amherst, N.S., writes:—"Please find enclosed money order for $1, for which continue my subscription to your valuable Railway and Marine World. It certainly is worth more for the information it contains."

The Lewis Construction Co., Ltd., has been incorporated under the Ontario Companies Act, with $40,000 capital, and office at Toronto, to build railways, bridges, viaducts, docks, wharves, etc., and act as general contractors. The provisional directors are, E. C. Lewis, W. Middlemist and H. A. Hawley, Toronto.

Norton, Griffiths and Co., Ltd., contractors, etc., passed a bylaw at a special meeting of shareholders in Vancouver, B.C., May 10, increasing the number of directors from five to ten, of whom four must be residents of England, and six residents of Canada. Two directors shall form a quorum. F. Carter-Cotton, of Vancouver, is President, and F. Molyneux, Secretary.

The Union Contract Co., has been incorporated under the Dominion Companies Act, with a capital of $250,000 and offices at Montreal, to carry on a general engineering and contracting business, particularly the building of wharves, docks, tunnels, bridges, etc. The provisional directors are: R. S. Stackhouse, R. Chenevert, G. H. Semple, W. G. Phillips, R. E. Allen, Montreal.

Canadian Freight Association.

T. Marshall, Chairman, has removed his office from the union station, Toronto, to the Canadian Express Building, Montreal, it being considered that Montreal is more suitable than Toronto, on account of the C.P.R. and G.T.R. headquarters being there. The Association's freight inspection department still has its offices in Toronto union station, in charge of P. K. Perry, Chief Inspector.

A press dispatch from Montreal, May 12, published in daily papers, stated that the Inland Navigation Co., Canadian Lake Line, Merchants Mutual Line and Jaques Line had withdrawn from the Canadian Freight Association, as they objected to freight rates forced by the Association and that a rate war was anticipated unless a compromise could be effected.

The facts are that the Inland Navigation Co. never was a member of the Association, but the management informs us that its relations with the Association have always been satisfactory. The Jaques Line has not withdrawn from membership. The Canadian Lake Line and the Merchants Mutual Line have withdrawn, contending that they get no benefit by being members. The question of rates has positively nothing to do with the matter and there is no prospect of any rate war.

Certain agreements are made every year with the lake and rail members of the Association, and the water lines which are not members, in regard to rates, and this agreement is carried out in a satisfactory manner. The withdrawal of the water lines above mentioned from the Association does not in any way disturb the agreement in regard to rates.

The water lines have a separate organization, the Lake Freight Association, of which H. A. Young, Traffic Manager, Canadian Lake Line, is Secretary with office at Toronto. The members of this Association are the Canadian Lake Line, Inland Navigation Co., Jaques Line and Merchants Mutual Line.

C.P.R. Colonization Plans.

Sir Thos. G. Shaughnessy is reported to have announced, May 5, that the company will select from its unsold lands farms of 160 acres each in Manitoba, Saskatchewan and Alberta, 25 farms in all; put up houses and buildings, with the necessary fencing; provide the necessary implements for working them, and suitable live stock. These farms will be offered to selected experienced men to be operated as mixed farms, on the condition that when a man has demonstrated his ability as a practical farmer, he will be permitted to purchase the property at cost, payable in six or eight instalments, with 6% interest. During the earlier part of the term, the company's representative will direct the general course of operations on the farms. The company has also arranged to put in operation a plan under which approved farmers, on making a purchase of lands from the company, will be granted a loan of $2,000 towards erecting the buildings, fences, etc. This money is to be repaid along with the cost of the land with 6% interest, the payments being spread over a period of 10 years. $500,000 has been appropriated, to be expended during this year. It is proposed to spend $1,000,000 in 1913, and $5,000,000 annually thereafter until the available lands are occupied.

H. Doughty, formerly Superintendent, Regina, Sask., Municipal Ry., is now engaged on Lethbridge, Alta., Municipal Ry. construction.

Railway Rolling Stock Notes.

The Intercolonial Ry. has received five consolidation locomotives from the Canadian Locomotive Co.

The Canadian Northern Ry. recently completed 35 cabooses out of an order of 50 at its Winnipeg shops.

The Grand Trunk Pacific Ry. has received seven first class cars from the Canadian Car and Foundry Co.

The Algoma Central and Hudson Bay Ry. has received one 10-wheel locomotive from the Canadian Locomotive Co.

The Dominion Bridge Co. recently ordered a Lidgerwood flat car, 30 tons capacity, from the Canadian Car and Foundry Co.

The Temiskaming and Northern Ontario Ry. has ordered four steel underframe conductors' vans from the Canadian Car and Foundry Co.

The Esquimalt and Nanaimo Ry. is reported to have purchased 60 logging cars of modern construction, equipped with automatic unloading apparatus, for use on its Cowichan River line.

The G.T.R. has recently placed orders for the following rolling stock:—2,000 box cars and 250 refrigerator cars, with the Canadian Car and Foundry Co., Montreal, and 1,000 box cars, 500 automobile cars, 250 refrigerator cars, 1,000 steel hopper bottom coal cars, in the U.S.

The Canadian Northern Ry., between Apr. 15 and May 15, ordered 50 cabooses from its Winnipeg shops, 450 box cars from the Canadian Car and Foundry Co., 300 box cars from the Crossen Car Co., 25 consolidation locomotives from the Canada Foundry Co., and 100 box cars elsewhere.

A press report, towards the end of April, stated that the C.P.R. had placed an order for the building of ten sleeping cars in the U.S. We are officially advised that the order referred to was placed in Dec., 1911, and noted in our issue of Jan., 1912. The cars mentioned are of the C.P.R. standard type, 72 ft. long.

The 2,000 wooden box cars referred to in our May issue as having been ordered by the C.P.R. at the Angus shops are to be constructed with the new reinforced end designed by R. W. Burnett, General Master Car Builder. This construction uses rolled sections for end posts with 1¾ in lining and no sheathing outside of the ends. The cars are also to have the new C.P.R. metal ladders.

The C.P.R., between Apr. 17 and May 13, received the following additions to rolling stock:—128 box cars, 14 vans, 4 first class cars, 2 superintendents' business cars, 6 sleeping cars, one T3 locomotive, and 4 G2 locomotives, from its Angus shops, Montreal; 581 box cars, 30 flat cars, from the Canadian Car and Foundry Co.; 8 D4 and 2 D10 locomotives from the Montreal Locomotive Works, and 292 box cars and 90 tank cars from the American Car and Foundry Co.

The question of establishing a more frequent service on the Temiskaming and Ontario Ry., between Golden City and Timmins, on the Porcupine subdivision, is under consideration. S. B. Clement, Chief Engineer and Superintendent of Maintenance, has been looking into various types of motor cars in operation in the U.S., and also the gas electric car which has been put in operation on the Quebec and Lake St. John Ry., and it is probable that an order of one car will be placed in the near future.

The C.P.R., between Apr. 17 and May 13, ordered the following additions to rolling stock:—109 vans, 2 suburban cars, 5 refrigerator cars, 9 stock cars, 5 flat cars, 10 sleeping cars, 5 dining cars, 20 first class cars, 10 tourist cars, 20 baggage and express cars, one G1 and 10 P1 locomotives, from its Angus shops, Montreal; 1 coal car and 85 box cars from the Canadian Car and Foundry Co.; 25 N3 locomotives, 25 D10 locomotives from the Montreal Locomotive Works, and two tank cars from the American Car and Foundry Co.

Following are the chief details of the two six wheel switching locomotives, type U3, which the C.P.R. is building at its Angus shops, Montreal, as mentioned in our last issue:—

Weight in working order	137,000 lbs.
Weight of tender loaded	90,000 lbs.
Weight of tender light	44,000 lbs.
Heating surface, firebox	138 sq. ft.
Heating surface, tubes	1,406 sq. ft.
Heating surface, total	1,544 sq. ft.
Grate area	29 sq. ft.
Tubes, no. and diar.	232 2 ins.
Firebox	Radial stayed
Boiler, type	Straight top
Boiler, pressure	200 lbs.
Wheel base	11 ft. 6 ins.
Cylinders, diar. and stroke	18 by 26 ins.
Valves	Piston 11 ins.
Valve gear	Walschaert
Driving wheels, diar.	52 ins.
Axles, driving	8½ by 10 ins.
Axles, tender	5 by 9 ins.
Air brakes	Westinghouse E. T. 6
Lubricators	Canadian Detroit 22

Following are the chief details of the 25 consolidation superheater locomotives which the C.P.R. is having built by the Montreal Locomotive Works, as mentioned in our last issue:—

Weight on drivers, in working order	105,000 lbs.
Total weight of engine in working order	220,000 lbs.
Total weight of engine in working order	220,000 lbs.
Weight of tender, loaded	134,000 lbs.
Tender capacity, water	5,000 imp. gals.
Tender capacity, coal	12 tons
Heating surface, firebox	165 sq. ft.
Heating surface, tubes	2,620 sq. ft.
Heating surface, total	2,785 sq. ft.
Heating surface, superheater	437 sq. ft.
Grate area	40 sq. ft.
Tubes, no. and diar.	270 2 ins., 24 5 ins.
Driving wheel base	16 ft. 6 ins.
Total wheel base, engine	25 ft. 5 ins.
Total wheel base, engine and tender	55 ft. 9⅞ ins.
Boiler, type	Extended wagon top
Superheater	Vaughan and Horsey, boiler tube
Stayings	Radial with cross stays
Cylinders, diar. and stroke	23½ by 32 ins.
Boiler pressure	180 lbs.
Driving wheel diar. outside	63 ins.

The Canadian Northern Ry. has ordered 25 consolidation locomotives, in addition to the 20 ordered at the end of 1910, now in course of delivery, from the Canada Foundry Co. Following are the chief details:—

Tractive effort	45,000 lbs.
Weight in working order	215,000 lbs.
Weight on drivers	190,000 lbs.
Weight on leading truck	25,000 lbs.
Wheel base, driving	16 ft. 6 ins.
Wheel base, total	25 ft. 5 ins.
Cylinders, diar. and stroke	24 by 32 ins.
Boiler, type	Extended wagon top
Boiler, pressure	180 lbs.
Boiler, outside diar. of first ring	72 ins.
Firebox, length and width	110 by 64 ins.
Firebox, water space front 5½ ins., sides and back	4½ ins.
Tubes, no. and diar.	272 2 ins.
Valves	Piston, 12 ins.
Driving wheels, diar.	63 ins.
Driving wheels, thickness of tires	3½ ins.
Driving journals	10 by 14 ins.
Truck wheels, diar.	30 ins.
Truck journals	6 by 12 ins.
Tender wheels, diar.	33 ins.
Tender journals	5½ by 10 ins.
Capacity, water	6,000 imp. gals.
Capacity, coal	10 tons

Rutland Rd—The application for the issue of receivers' certificates, for the purpose of paying taxes, pay rolls, etc., due the Rutland Rd. by purchase from the New York, New Haven and Hartford Rd., to acquire a controlling interest in New York Central and Hudson River Rd., came before the Public Service Commission at Albany, N.Y., May 2. The application was opposed by S. Untermeyer, New York, on behalf of 17,000 shares of minority stock.

Traffic Orders by the Board of Railway Commissioners.

The dates given for orders are those on which the hearings took place, and not those on which the orders were issued:—

Freight Rates from Hinton West.

16242. April 2. The petitions of the residents of Resplendent and Moose Lake, B.C., and Fitzhugh, Prairie Creek, Edmonton, Edson, and Hinton, for an order directing the Grand Trunk Pacific Ry. to open for traffic its railway from Prairie Creek west; it is ordered that the G.T.P.R. cease discriminating in the carriage of freight traffic in favor of its contractors as against the general public over its railway from Hinton, Alta., west thereof; and that for every case of default in complying with the terms of this order and the continuation of the discrimination complained of, the company shall be subject to a fine of $100.

Rates on Anthracite Coal from Niagara Frontier.

16276. April 11. Re consideration of protest of Canadian Retail Coal Dealers' Association and others against the proposed tariffs of railway companies advancing rates on anthracite coal from the Niagara frontier to Canadian points, to take effect May 1. It is ordered that the effective dates of the following tariffs, namely:—Michigan Central Rd. C.R.C. no. 1874. Grand Trunk Ry. C.R.C. no. E 2376, as amended by supplement 1; Wabash Rd. C.R.C. 566, as amended by supplement 1, be postponed from May 1, pending a decision by the board.

Rates on Rope from Montreal.

16314. April 12. Re application of the Consumers' Cordage Co., Ltd., of Montreal, for an order disallowing supplement 6 to G.T.R. special commodity tariff, C.R.C. no. E. 1432, and supplement 5 to C.P.R. special commodity tariff, C.R.C. no. E. 1286, advancing from Jan. 29, 1912, the rates on rope, in carloads, from Montreal, to the fifth class basis, and re order 15844, Jan. 27, 1912, postponing the operation of the said schedules until further order. It is ordered that the said supplement may become effective June 1.

Rates on Cornmeal from Montreal.

16394. April 25. Re application of Transportation Bureau of Montreal Board of Trade, under sec. 315 of the Railway Act, for an order directing the Canadian Pacific Railway Company to adjust its rates on corn brought into Montreal via Detroit or Georgian Bay elevator ports, and on cornmeal shipped from Montreal to St. John, N.B., and other stations in the Maritime Provinces, so that the combined tolls charged on the corn to Montreal and the cornmeal from Montreal to said destinations in the Maritime Provinces will not be on any higher basis than the combined tolls charged on the corn to and the cornmeal from Ontario points to the same destinations in the Maritime Provinces, and re the direction that the railway companies show cause why the wheat and oats rates should not apply on corn shipments from Detroit and Georgian Bay ports to Montreal, and also, why the C.P.R. rate on cornmeal from Montreal to St. John should not be 15c. per 100 lbs. It is ordered that the application be dismissed.

Rates on Wire Fencing.

16395. April 23. Re application of Canadian Freight Association for an order rescinding order 6844, Apr. 6, 1909, in so far as it relates to commodity rates on wire fencing and netting, in carloads from Hamilton, Windsor and Walkerville to points east of Toronto as provided in said order. It is ordered that the application be refused.

Canadian Pacific Railway Construction, Betterments, Etc.

St. John Improvements.—The site chosen for the new elevator to be built at St. John, N.B., is at the northeast corner of the dividing line between the land leased to the company by the city and what is known as the 400 ft. strip. This is on the western side of the harbor, and not far from the present elevator. The work will probably be gone on with this year, but we have been advised that neither this nor the capacity of the elevator have been definitely decided.

Quebec.—While in Quebec, May 2, D. McNicoll, Vice President, made an inspection of the company's property there in connection with the plans for improvements which are under consideration. It is said that the works will include the provision of a yard for freight cars west of the station, the building of a roadway to connect with the Louise embankment, the enlargement of the yards and a new freight shed at the Palais. The question of building a new passenger station is held in abeyance.

Ottawa.—In connection with the project for a tunnel in Ottawa, a proposed change is under consideration. The suggestion is to carry the tunnel down Wellington street as far as Bank street, skirt round the cliff, and then run southwesterly to the union station. It is stated that this would give a shorter and less expensive route that the original one of running the tunnel right down under Wellington street to the union station.

Smiths Falls, Ont. — Arrangements are being made to do away with the foot bridge across the tracks at George St., Smiths Falls, Ont., and to replace it by a subway under the tracks, 110 ft. long, 10 ft. wide and 7 ft. 6 in. high.

Campbellford, Lake Ontario and Western Ry.—The Board of Railway Commissioners has approved location plans for the line from mileage 88.21 to 106.17, mileage 124.83 to 125.5; revised location plans from mileage 127 to 134.68, and from mileage 134.68 to 155.67, and has authorized the crossing of the Kingston and Pembroke Ry. at mileage 24.8, the Canadian Northern Ontario Ry. at mileage 87.86, and the Central Ontario Ry. at mileage 88.09, in all cases from Glen Tay. The latter is to be an overhead crossing.

The Montreal papers stated recently that a contract had been let to Larkin and Sangster, St. Catharines, Ont., for boring a 900 ft. tunnel on the new lake shore line, 15 miles out of Smith's Falls. We are officially advised that the reports are incorrect.

Construction on the line was started May 1, two camps having been opened, one at Trenton, and the other at Bayside, six miles from Belleville. The latter is McRae and Campagne, who have a subcontract for three miles. The general contractors and the company's engineers are establishing their headquarters at Agincourt, about ten miles out of Toronto.

D. McNicoll, Vice President, and other C.P.R. officers, after inspecting the Kingston and Pembroke Ry. terminals in Kingston, Ont., May 17, went by automobile to Belleville. It is said that the object of the trip was to look into the question of the construction of a branch line from Belleville to Kingston, but it is not probable that this will be built until after the line from Glen Tay to Leaside is built.

Georgian Bay and Seaboard Ry.—The opening of the entire line for general traffic took place May 4. The company's fleet of vessels arrived at Port McNicoll from Owen Sound May 2, and the first one sailed May 4. Trains from Montreal branch of the Montreal-Toronto line at Bethany Jct., and those from Toronto, join the new line at Coldwater Jct., proceeding to the new port, Port McNicoll, on Victoria Harbor.

A meeting of shareholders will be held at Montreal, June 30, to authorize the issue of additional bonds for the completion and equipment of the line.

It is proposed to add an additional storage capacity of 2,000,000 bush. to the capacity of the grain elevator at Port McNicoll.

Lake Superior Division Second Track.—We are officially advised that while some surveys have been made with a view to a revision of grades and the building of a second track, etc., along the Lake Superior division, nothing definite has yet been decided upon.

Fort William, Ont.—A portion of the double deck bascule bridge under construction over the Kaministikwia River at Fort William, fell during a gale, April 27. The three shore spans on the island side were completely demolished.

The erection of the new 1,000 ft. freight shed on the Kaministikwia River is being proceeded with.

It is proposed to erect a new breaking elevator at Fort William.

Freight Yards at Kildonan, Man.—The Board of Railway Commissioners has authorized the C.P.R. to expropriate lands in Kildonan parish, and part of n. w. ¼ sec 17, tp. 11, r 4 east of the principal meridian, for the purpose of establishing yards.

We are officially advised that the new clearing yard which is to be constructed will be about five miles east of Winnipeg. The original main line runs north from Winnipeg to East Selkirk, and from that point turns east. A few years ago a cut-off was built from Winnipeg to join the original main line at Molson, a distance of 38 miles. This cut-off is now used as the eastbound main track, and the old original main line via East Selkirk is used as the main westbound track between Molson and Winnipeg. The new yard will be beween the two main lines mentioned. It will be approached from the east by tracks leaving the main line, just west of the crossing of the Canadian Northern Ry., and will connect with the C.P.R. Lac du Bonnet branch, by three tracks, at the west.

The yard will be of the gravity type, receiving tracks on one side of the hump, and classification and departure tracks on the other side. These facilities will be constructed for both east and westbound movements. The ground selected for the work is quite level, and consequently does not naturally lend itself to the grades required. Grading, for the yard, therefore, will be quite heavy, consisting of about 2,000,000 yards to take care of about 100 miles of track.

The ultimate layout will probably require two full circle roundhouses with the necessary tracks, ash pit, coal chutes, etc., to serve them. This year, however, only a 30-stall standard brick roundhouse will be built.

A grain elevator will be erected on the north side of the yard, with storage for 1,000,000 bush., and cleaning facilities for 100 cars a day.

Gimli Branch.—Vice President Bury is quoted as stating that the President had authorized the immediate starting of construction on the extension of the branch now ending at Gimli, Man., northerly to the Icelandic River.

Winnipeg Station.—In a recent interview, Vice President Bury is quoted as stating that the company's station at Winnipeg will be greatly enlarged. Plans had previously been prepared for additions, but these are being revised in order to provide ample accommodation for future requirements. As soon as the new plans are completed, the work will be put in hand and pushed to completion as fast as possible.

Saskatoon, Sask.—Press reports state that the company has purchased for $90,000 a property on which to erect a large office building.

Weyburn-Lethbridge Line.—We are officially advised that a contract has been let to J. Timothy, Edmonton, for grading, etc., on the section from Stirling, easterly, for 25 miles. A large quantity of contractors' plant and equipment has been delivered, and work has been started.

Alberta Ry. and Irrigation Co.—Division Engineer Brooks, and other C.P.R. officials, arrived in Lethbridge, May 10, to make an inspection of the line with a view of bringing it up to the C.P.R. standard. It is proposed to cut out some of the gradients, to generally improve the roadbed, and to lay heavier steel. The fact that the C.P.R. line from Weyburn joins the A.R. and I. Co.'s line at Stirling, makes it important that the line be put in a position to carry the heavier traffic which it is proposed to run over it.

Alberta Central Ry.—A meeting of shareholders will be held in Montreal, June 4, to approve of the lease of the company's railway, in process of construction, to the C.P.R., to arrange for an issue of bonds for the purpose of constructing and equipping the line.

D. F. McArthur, the general contractor, is quoted as stating that the grading for the line from Red Deer west to Rocky Mountain House, will be completed early in June, and that by the end of June the steel bridge over the Red Deer River will be finished. It is expected to have track laid on this section of the line early in the fall.

Strathcona-Edmonton High Level Bridge.—Four spans of this bridge across the Saskatchewan River have been completed, and the fifth is well advanced. False work is being erected for the succeeding spans.

Kootenay Central Ry.—Grading is reported to have been completed to 42 miles from Golden, B.C., and track is being laid.

Three Forks - Bear Lake - Kaslo.—A press report states that the line between Three Forks and Kaslo, B.C., will be connected up this season, and that Anderson and Co. have been increasing the number of men employed. This work, one report adds, involves the completion of the Bear Lake spur, at present under construction from Three Forks, the standardization of the Kaslo and Slocan Ry., for which an agreement was approved by the British Columbia Legislature at the recent session, and the building of about eight miles of new track.

British Columbia Second Track Work.—F. F. Busteed, who is in charge of this work, with headquarters at Kamloops, B.C., is quoted as stating that the location of the new grade has been practically completed between Ruby Creek and Spence's Bridge, and a lot of survey work has been done between that point and Kamloops. In many places the new location is several miles from the present route. There are two survey parties engaged east of Revelstoke, and another will be put in the field shortly. No work will be undertaken until the full data have been secured.

Coquitlam Shops, Etc.—Construction has been started on the first quarter of a 48 stall roundhouse at Coquitlam, Sanford, Gordon and Son being the contractors. The section will have a frontage of 165 ft., by 90 ft. depth, and will be 318 ft. from end to end at the rear. A boiler house 48 by 49 ft. will also be erected by the same contractors. (May, pg. 228.)

A. E. WILKINSON, Division Freight Agent, Intercolonial Ry., Halifax, N.S., writes:—"I have always been interested in The Railway and Marine World, finding its articles very interesting."

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National Transcontinental Railway Construction.

The commissioners received tenders to May 31 for the construction of 200 ton mechanical coaling plants, with sandhouses and track approaches at Moncton, N.B., Napadogan, N.B., Edmundston, N.B., Grant, Ont., Calvert, Ont., and Armstrong, Ont. Tenders were also received to May 31 for the construction of a 1,000 ton coaling station with inclined trestle approach at Cochrane, Ont.

Tenders were also received to May 31 for the erection of station and other buildings required on the following sections of the line:—Sec. 13, Moncton, N.B.; section 14, from Langelier to Chapais, Que.; sec. 15, from Monk to Parent, Que.; sec. 16, from Fowke to Clarke, Ont.; sec. 17, from Carling to Murphy, Ont.; sec. 18, from Collins to Gordon, Ont.

The question of the provision of terminal facilities for the N.T.R. at Quebec, which was taken under consideration by the present Government after its accession to office in Sept., 1911, and by R. W. Leonard, who now constitutes the commission, is apparently being settled on a new basis. The following statement was given out, May 3, at Quebec by the Minister of Railways and Mr. Leonard:— "At the last Cabinet Council meeting, before the Hon. Mr. Pelletier left Ottawa, the question of the terminals at Quebec was fully considered, and it was then officially declared that a decision would be taken here today. The visit which we have made has confirmed us in the opinion that the ideal place to enter the city, especially for passenger traffic, is to pierce a tunnel from Wolf's Cove to St. Malo, and to have a union passenger station at the Palais. The Champlain market site will be utilized for local freight. There is no room on the Champlain market site for big elevators, and the place is too narrow. The railways here must soon handle a great part of the through grain traffic, and an elevator of some 10,000,000 bush. capacity is necessary. It should be built in such a way that other units may be added, so as to handle from 20,000,000 to 30,000,000 bush. In order to do this, there must be space to move about. The Government has bought, in St. Malo, 200 acres of fine property, which will be used for a car yard. As to the work shops, the site already chosen at St. Foye, near the bridge, is a very good one, and has been finally decided upon. We will have car ferries, which will take care of the traffic, pending the completion of the Quebec bridge. The work will be begun as soon as the plans are completed, and will be brought to a satisfactory completion without delay."

The locomotive shops at Transcona, Man., have been completed, inspected by the Government engineers and taken over from the contractors, Haney, Quinlan and Robertson.

R. W. Leonard arrived in Montreal, May 16, after having completed an official inspection of the sections of the line under construction east and west of Quebec. There is a gap of 32 miles to be completed between Quebec and the New Brunswick boundary. West of Quebec the line is completed for 100 west of La Tuque. There are about 200 miles to be completed between the end of track and Cochrane, Ont., which it is expected to have done by the end of 1913. The line from Cochrane to the junction with the Lake Superior branch, G.T. Pacific Ry., is expected to be completed this year. Arrangements are reported to have been made by which the C.P.R. will connect with the line at Grand Falls, N.B., for hauling lumber and the operation of a mixed service between Quebec and La Tuque.

Grand Trunk Pacific Railway Construction.

At the Fort William terminals of the G.T.P. branch line from the National Transcontinental Ry., a large force is working on the 2,500,000 bush. addition to the elevator, which it is expected to have completed by the fall. All the piles have been driven, and the concrete is being placed. It is expected to make a start on the new coal docks, and to carry out other improvements during this year.

Work is being proceeded with on the Harte-Brandon branch in Manitoba. We are officially advised that nothing definite has been decided with reference to the extension of the line from Canora, Sask., in the direction of Hudson Bay.

In regard to work in Saskatchewan the Provincial Premier is reported to have stated, May 1, that he had been advised that the company will lay nearly 400 miles of steel in the province this year. The branches from Regina to the International boundary, from Regina to Moose Jaw: to Prince Albert, and from Biggar towards Calgary, will be completed, the latter probably beyond the boundary into Alberta. Reports from Regina state that one track laying outfit started work there, and by May 8 had laid 20 miles on the line towards the International boundary.

In Alberta a second track laying outfit started work at mileage 102 on the line from Tofield towards Calgary, and was reported to have laid 25 miles of track to May 8.

In connection with the plans for station and terminal facilities in Calgary, an agreement has been reached, and is awaiting final ratification between the company, the city and the Dominion Government. It provides for the sale of the N.W.P. barracks by the Government to the company for $150,000. The company is to transfer a portion of the land so acquired for street purposes, pay for the moving of the barracks, and provide some buildings for other purposes, pave an avenue, and contribute $25,000 towards the erection of an additional span on the traffic bridge over the Elbow River, connecting East Calgary with the city. On the site of the present barracks the company contracts to build a station facing Eighth Ave., at a cost of between $275,000 and $300,000; and suitable freight sheds on the south side facing Muth Ave. The plan of the lay out of the property shows that the line will cross the Elbow River at its confluence with the Bow River, and that tracks will extend to Sixth St. The station building will be 150 by 100 ft., and the freight shed will be 700 by 50 ft. There will be three passenger platforms, the central one 40 ft. wide, and one at each side 25 ft. wide.

Plans are before the Minister of Railways for a line from Calgary to Coutts, but owing to some objections a new survey is being made, and in connection with this an effort is being made in Great Falls, Mont., to have an arrangement made by which the line will be extended into that place.

It is expected that building operations will be started shortly on the hotel in Edmonton, Alta., for which plans have been prepared by Ross and McFarlane, Montreal.

A tracklaying outfit has started operations from the present end of track near the Alberta-British Columbia boundary, and it is expected that track will be laid to Tete Jaune Cache by July 1. Another tracklaying outfit has started working easterly from the present rail head 164 miles out of Prince Rupert. P. Welch is quoted as stating on his return from a trip east from Prince Rupert, that a train service would shortly be extended to the Skeena River crossing, and that grading was well advanced right along to Fraser Lake.

We are officially advised that a con-

tract has been let to the British North American Construction Co., Vancouver, for preliminary work on the construction of dry docks and wharves at Prince Rupert, B.C. The contract covers the supply of materials, the erection of platform and piers, and launching platform. These are to be built with creosoted piles and lumber. Mr. Dow, the President of the company, is in direct charge of the work, the engineers for the railway being Kirby and Donnelly. W. T. Donnelly arrived at Prince Rupert, May 1, to take charge of the work. The lumber is being delivered

A. W. Smithers, Chairman of the Board, G.T.R., is reported to have stated at Montreal, May 25, that after consultation with officials he felt justified in stating that the whole of the track between Moncton, N.B., and Prince Rupert, B.C., would be laid by the autumn of 1914.

Railway Finance, Meetings, Etc.

Alberta Ry. and Irrigation Co.—A meeting of shareholders was held in Montreal, May 27, to issue bonds and authorizing the form of mortgage to be given to secure them.

Algoma Central and Hudson Bay Ry.—Algoma Eastern Ry.—There have been deposited with the Secretary of State at Ottawa agreements made between these two companies and the Superior Rolling Stock Co., dated May 15, covering the conditional sale of certain rolling stock.

Canada Southern Ry.—At the annual meeting to be held at St. Thomas, Ont., June 5, the shareholders will be asked to ratify the action of the directors in authorizing the execution of a mortgage to secure an issue of $40,000,000 of bonds at not exceeding 5% interest, of which amount it is proposed to issue $22,500,000 at once with the Michigan Central Rd.'s guarantee for the purpose of refunding the first and second mortgage bonds due Jan. 1 and Mar. 1, 1913, respectively, and to cover the cost of improvements already made or to be made to the company's property.

Canadian Northern Alberta Ry.—There has been deposited with the Secretary of State at Ottawa a supplemental trust mortgage dated April 20, between the C.N.A. Ry. Co., the British Trust Co., the National Trust Co., the Dominion of Canada, and the Canadian Northern Ry. Co., securing an issue of first mortgage debenture stock guaranteed by the Dominion. The original mortgage deed is dated Mar. 22, 1911.

Canadian Northern Pacific Ry.—An issue of $1,375,000 of 4% bonds guaranteed by the province of British Columbia has been placed on the London, Eng., market.

Canadian Northern Ry.—A lease of railway rolling stock and equipment series C 1, 1912, from the Imperial Rolling Stock Co., to the C.N. Ry., dated Apr. 27, has been filed with the Secretary of State at Ottawa.

Canadian Pacific Ry.—Application has been made to the London, Eng., Stock Exchange for the listing of $18,000,000 of ordinary stock, and £1,000,000 additional 4% perpetual consolidated debenture stock.

Dominion Atlantic Ry.—Estimated passenger earnings for Apr., $42,320.94; freight earnings, $50,839.04; total, $93,159.98, against $82,400 total earnings for April, 1911.

The Grand Trunk Ry recently made an issue in London, Eng., of £1,500,000 perpetual 4% consolidated debenture stock at 98½, the proceeds of which are to be applied to general purposes.

G.T.R. Car Trust Notes.—Blair and Co., New York City, have purchased from the G.T.R. $4,000,000 4½% car trust notes, maturing serially in from six months to ten years. The proceeds will be used by the railway company to pay for 3,000 steel underframe box cars, 1,000 50 ton all steel coal cars, 500 automobile cars and 500 refrigerator cars which are under order. The banking firm will shortly offer these notes for public sale. A copy of the agreement made between the G.T.R. Co., Blair and Co., and the Bankers Trust Co. has been deposited with the Secretary of State at Ottawa.

Intercolonial Ry.—The earnings for April are reported as $1,006,000, an increase of $87,000 over those for Apr., 1911, and the highest yet reached in one month.

Pere Marquette Rd.—The receivers have been authorized to issue $605,000 April 30.

Quebec Central Ry.—Gross earnings for March, $92,320.81; expenses, $63,729.33; net earnings, $28,591.48, against $100,818.63, gross earnings; $65,999.03, expenses; $34,819.60, net earnings for March, 1911. Aggregate gross earnings for nine months ended March 31, $960,069.97; expenses, $669,434.59; net earnings, $290,635.38, against $860,360.39, aggregate gross earnings; $595,560.14, expenses; $264,800.25, net earnings for same period, 1910-11.

Quebec Oriental Ry.—Owing to the fact that a quorum of bondholders was not present Apr. 16, the meeting of holders of first and second 5% first mortgage Matapedia section gold bonds was adjourned to May 14, at the company's offices, London, Eng.

River and Rail Coal Co.—The Grand Trunk Ry. is reported to have acquired control of the properties of this company in Belmount county, Ohio, through a syndicate. The company has outstanding $17,971,942 of stock, and is placing on the British markets a further issue of $7,500,000. The company will, it is said, continue to be operated as a separate undertaking, but its output will be taken almost entirely by the G.T.R., and allied companies. (May, pg. 246.)

Rutland Rd.—There has been filed with the Secretary of State at Ottawa an agreement between G. T. Jarvis and others, the vendors; the Guaranty Trust Co. of New York, trustees, and the R. Rd. Co., dated Apr. 1, respecting the title of the company's lines in Canada.

Temiscouata Ry.—Net profit for Mar., $3,059.

White Pass and Yukon Route.—Total earnings for three months ended Mar. 31, $48,569, against $68,960 for same period 1911.

The Chicago, Milwaukee and St. Paul Ry. has removed its ticket office in Winnipeg from Douglas St. to Government St.

Port Arthur, Ont., citizens, on May 22, by an almost unanimous vote, carried the bylaw confirming the agreement with F. M. Brown and others, of Halifax, N.S., for the establishment of car works.

The Grand Trunk Pacific Ry. Co. ordered some little time since 40,000 tons of steel rails, 60 lbs., from the Algoma Steel Co., for G.T.P. branch lines, deliveries of which are now being made at Fort William.

Work was started, May 1, on laying out the site for the new union stock yards at St. Boniface, Man., by the Public Markets Co., in which the C.P.R., the Canadian Northern Ry. and the G.T. Pacific Ry. are jointly interested.

The Minister of Railways is reported to have announced at Moncton, N.B., May 10, that it was proposed to put a Sunday train on the Intercolonial Ry. between Halifax, N.S., and Montreal, but that nothing had been decided as to running one to and from St. John, N.B., also.

Grand Trunk Ry. Betterments, Construction, Etc.

Southern New England Ry.—The Railroads Committee of the Massachusetts Legislature decided, May 17, to report favorably on the company's bill asking for power to extend its lines into Boston.

Work was started May 10 on the construction of the line from Palmer, Mass., to Providence, R.I. The initial work consists of the building of a temporary bridge 2,800 ft. long across the New York, New Haven and Hartford Rd. freight yards at Woonsocket, R.I., near where the line enters the state from Blackstone, Mass. Ten car loads of machinery and six steam shovels have been delivered for the grading contractors, who are preparing to start operations.

Central Vermont Ry.—The Board of Railway Commissioners has approved of the proposed connection of the company's lines with the C.P.R. spur into the military camp at Farnham, Que.

Surveys are being made for second track work on the line in New Hampshire, and for a connecting link starting from White River Jct. passing through Manchester, Concord and the southern towns of the state. G. M. Thompson, formerly of the Boston and Maine Rd., is in charge of the work.

Back Cove Bridge, Portland, Me.—The company is renewing the swing bridge at Back Cove one mile west of Portland on the main line between Portland and Montreal. The swing which is being replaced consisted of a 186 ft. pony lattice equal arm swing, supported at the centre on a granite pier, and the ends on piled bents. It was built in 1893. The new work comprises the construction of two end piers for new swing. These new piers will be located behind the existing piled bent supports, thus avoiding during construction the interference of the operation of old swing. This necessitates a longer new swing, but it will be less expensive than attempting to locate new piers on existing site of end supports. The new swing will be 225 ft. long. For economical design the track will be permanently raised 3 ft. It is also the intention to add a 22 ft. granite course to the pivot pier, as high tide now washes the present top of pier. The rest piers will be built by sinking a double wall timber caisson. There is an average of 30 ft. of water at the site of new piers, and about 45 ft. to rock. The rock is overlaid with a layer of soft blue clay and sand. The caisson timbers will be framed on a wharf close by. The cutting edges and lower wall timbers will be put together and floated to site, and the remainder of the caisson will be built up in place and sunk by filling in between double walls with concrete to rock. Excavation will be done inside the caisson by the orange peel bucket. Divers will be employed to level off bottom and underpin and seal cutting edges. The construction of piers has been let to the John S. Metcalf Co., Montreal. The contract for the fabrication and erection of the new swing has been let in the U.S. As before stated, it will be a single track swing span 225 ft. centre bearing type. The work is under the supervision of H. R. Safford, Chief Engineer.

Montreal Track Elevation.—The question of elevation of tracks in Montreal is still before the Board of Railway Commissioners. The city council representatives are not prepared to undertake to contribute more than $2,000,000 towards the cost of the work, and the company's representatives state that it is not a sufficient proportion to pay for the benefits that would accrue to the city.

Bay City, Mich.—A contract is reported to have been let for the concrete work for the piers and abutments of the new bridge at Bay City, Mich., which has a total length of 1,300 ft.

Mainly About Transportation People.

SIR THOMAS G. SHAUGHNESSY sailed from New York for England, May 8.

SIR H. MONTAGU ALLAN left Montreal, for England, May 12, where he joined Lady Allan.

A. S. RAY, C.P.R. Agent, Bristol, England, arrived in Montreal, May 15, on a business trip.

A. A. ALLAN, of the Allan Steamship Line, with Mrs., and Miss H. Allan, arrived in England, May 5, on a visit.

SIR DONALD MANN returned to Toronto, via New York, May 19, from England, after an absence of about four weeks.

L. E. MORIN, paymaster on the Quebec canals for the Department of Railways and Canals, died in Montreal, May 17.

F. A. MCHUGH, who was engaged in railway contracting in the west since 1883, died at Calgary, Alta., May 6, aged 61.

L. W. PERRY, who resigned his position as Divisional Car Foreman, C.P.R., West Toronto, a short time ago, was 16 years in the service.

G. F. SNYDER, who had been for over 50 years in the G.T.R. service as station agent prior to retiring in 1908, died at Montreal, May 7.

A. SHAUGHNESSY, son of Sir Thos. G. Shaughnessy, President, C.P.R., was married to Miss S. P. Bradford at Woodstock, Tenn., April 30.

H. B. SPENCER, Superintendent, C.P.R., Ottawa, returned home recently after a six weeks vacation, very much improved in health, and resumed duty.

MR. FITZGERALD, a member of the C.P.R. office staff at Yokohama, left Montreal, May 15, to return to Japan, after a holiday trip to England.

F. W. PETERS, the newly appointed General Superintendent, Pacific Division, C.P.R. arrived in Vancouver, May 10, and took over the duties of the office.

JAS. FLYNN, a yard master employed on the Montreal Harbor Commissioners' lines, was killed by a shunting engine near the Donaldson Line pier, May 10.

E. H. KEATING, M. Can. Soc. C.E., formerly Manager, Toronto Ry., has been elected a member of the council of the Institute of Civil Engineers, England.

F. W. THOMPSON, Vice President, Ogilvie Flour Mills Co., Montreal, who died in London, Eng., May 7, was President of the Keystone Transportation Co.

W. A. COATES, Freight Traffic Manager of the Robert Reford Co., has resumed duty at the company's Montreal office, after spending the winter in Europe.

A. W. DEACON, town ticket agent, G.T.R., Stratford, Ont., and H. L. Jackson, ticket agent, C.P.R., Brussels, Ont., have joined the Canadian Ticket Agents Association.

S. MCINTOSH, who died at Martintown, Ont., May 6, aged 86, was a member of the family from which sprang the McIntosh Bros., railway contractors, Milwaukee, Wis.

D. W. HAYES, agent, G.T.R., London, Ont., was presented with a gold chain and locket, May 13, by the staff at Guelph, Ont., from which point he was recently transferred.

THOS CROCKER, for many years foreman tinsmith, G.T.R. car shops, Point St. Charles, Montreal, died there May 6, aged 76. He had been on the pension list for about four years.

HON. J. D. HAZEN, Minister of Marine and Fisheries, was elected President of the North American Fish and Game Protective Association at the annual meeting at Boston, Mass., recently.

W. PERRY, Montreal, who celebrated his 75th birthday May 3, installed the water supply on the G.T.R. from Montreal to Levis, and the first water supply plant for the C.P.R. at Winnipeg.

HUGH SUTHERLAND, General Executive Agent, Canadian Northern Ry., who, with Mrs. Sutherland, spent most of the winter in Europe and Egypt, returned to Winnipeg towards the end of April.

D. FINLAY, Canadian Northern Ry., construction foreman at Stettler, Alta., was killed in the yard there recently in a collision between the motorcycle, which he was driving, and a freight engine.

A. R. MCLENNAN, who died at Cornwall, Ont., recently, aged 72, was for many years engaged in railway contracting in the Maritime Provinces, Quebec, Ontario, Manitoba, Minnesota and Wisconsin.

A. B. MANSON, S. Can. Soc. C.E., who has been appointed City Engineer of Stratford, Ont., was until recently on the engineering staff of the Canadian Northern Ontario Ry.'s Montreal-Port Arthur line.

W. R. DAVIDSON, Trainmaster, G.T.R., London, Ont., met with a painful accident at Hamilton recently, when a heavy steel rail dropped on his foot. An examination showed that no permanent injury will result.

P278 Louis K. Jones, I.S.O.,
Assistant Deputy Minister and Secretary, Department of Railways and Canals.

JAS. BRYCE was presented with a service of silver plate and an address by Canadian Express Co. employes in Montreal, May 14, on his retirement from the office of Vice President and Manager.

TRAFFORD JONES, of Canadian Brake Shoes, Ltd., Montreal, and formerly of the Canadian Northern Ry.'s mechanical department, Toronto, was married at Toronto recently to Madeline, youngest daughter of Alfred W. Smith.

A. R. G. HEWARD, formerly Assistant Secretary, C.P.R., Montreal, collapsed on McGill St., Montreal, May 16, and died, aged 52. He was in C.P.R. service for about 30 years, and retired at the end of 1911, on account of ill health.

E. C. HAWKINS, Chief Engineer Copper River and Northwestern Rd., of Cordova, Alaska, who died in New York April 10, aged 52, built the White Pass and Yukon Ry. In our last issue he was erroneously referred to as A. Hawkins.

W. E. DUPEROW was presented with a Morris chair by the ticket agents of Victoria, B.C., on his leaving that city for Vancouver to take up duty as General Agent, G.T. Pacific Ry. Passenger Department.

C. R. BOUCHER, who died at Sault Ste. Marie, Ont., April 26, was engaged in supervising the building of bridges on the Algoma Central Ry. He was previously engaged on the construction of the Temiskaming and Northern Ontario Ry.

Miss A. I. Hendry, daughter of J. HENDRY, President Vancouver, Westminster and Northern Ry., Vancouver, B.C., was married in London, Eng., May 14, to E. Hamber, manager of the Dominion Bank in London, Eng., and formerly of Winnipeg.

L. CHIPMAN, engineer in charge of a locating party on the Edmonton, Dunvegan and British Columbia Ry., was drowned in the Athabasca River near Mirror Landing, early in April. The news was not reported in Edmonton until the end of the month.

JUSTICE A. A. DOBSON, of the Manitoba Court of King's Bench, has been appointed Public Utilities Commissioner for that Province, County Judge Cumberland, of Brandon, who was first appointed to the position, having decided to retain his seat on the bench.

H. R. NAYLOR, who was recently appointed shop foreman, C.P.R., West Toronto, was born in Hull, Eng., Aug. 30, 1885, and commenced railway service there with the North Eastern Ry. He entered C.P.R service in Feb., 1909, and was, from Mar. 1911, to Apr., 1912, steam heat inspector.

J. LONSDALE DOUPE, whose resignation as General Townsite Agent, Department of Natural Resources, C.P.R., Calgary, Alta., was announced in our last issue, has entered the real estate and agency business, having incorporated the Western Land and Townsite Co., Winnipeg, of which he will be manager.

R. TINNING, Travelling Freight Agent, G.T.R., Toronto, who retired under the provisions of the pension rules, after 50 years' service, May 1, was entertained to dinner by his associates on the local staff, recently, and presented with a diamond and pearl pin and a purse of gold, and a silver purse for Mrs. Tinning.

D. F. MAXWELL, who has resigned as Chief Engineer, Fredericton and Grand Lake Coal and Ry. Co., Fredericton, N.B., is one of the incorporators of the St. Croix Ry. and Dock Co., which is promoting a bill in the New Brunswick Legislature for railway and dock development in the neighborhood of St. Croix, N.B.

F. E. TRAUTMAN, editor of the Times-Journal, Fort William, Ont., has resigned and, it is reported, has been appointed on the staff of Geo. Bury, Vice President and General Manager, C.P.R. Western Lines, Winnipeg. Press dispatches state that Mr. Trantman will have charge of an office which will supply news of the C.P.R. system to the newspapers.

H. L. MALTBY, formerly chief clerk in the C.P.R. engineering offices, Montreal, died there recently after a lengthened illness. Before entering the C.P.R. service he was associated with H. J. Beemer in his railway enterprises, and was appointed guardian of the Ottawa and Gatineau Ry. by the banks, prior to its becoming merged with the Ottawa Northern and Western Ry., and being transferred to the C.P.R.

The estate of the late SIR ROBERT G. REID, founder of the Reid Newfoundland Co., has been held liable for succession duties in the province of Quebec, for $108,857. The estate in Quebec was

valued at $1,789,926, on which the duties were $136,000. The executors paid $40,000, and disputed liability as to the balance, on the ground that certain bonds and securities were not legitimately chargeable with succession duty in the province. Judgment has been given in favor of the Crown.

A. J. WOLFE, whose appointment as Roadmaster, White River subdivision, Lake Superior Division, C.P.R., White River, Ont., was announced in our last issue, was born in Essex county, Ont., Jan. 18, 1885, and entered railway service in 1903, since when he has been, to Mar., 1905, laborer, M.C.R.; Mar., 1905, to Feb., 1909, section foreman, extra gang foreman and yard foreman, same road; Feb., 1909, to Mar. 27, 1912, yard foreman, snow plough foreman, extra gang foreman and general foreman, Sudbury subdivision, C.P.R.

HON. F. COCHRANE, Minister of Railways, started from Ottawa, May 1, on an inspection trip over the Canadian lines. He travelled to Quebec and thence he went over the lines in the continental Railway to Moncton, from thence he went over the lines in the Maritime Provinces. The programme for the rest of the trip includes a trip over the National Transcontinental Railway to the end of track, and then an inspection of the various lines right out to the Pacific coast, particularly where construction is in progress.

E. D. BRONNER, who has been appointed General Manager, Michigan Central Rd., Detroit, Mich., was born at Buffalo, N.Y., Feb. 19, 1859, and was educated at the public schools and the U.S. Naval Academy, Annapolis. He entered railway service in 1880 as draughtsman in the Car Department, Canada Southern Ry., and was appointed General Foreman, M.C.R. car shops, Detroit, Mich., Feb. 1, 1890, Master Car Builder, May 6, 1896, and Superintendent of Motive Power, Feb. 1, 1900, which position he held to May 15, the date of his present appointment.

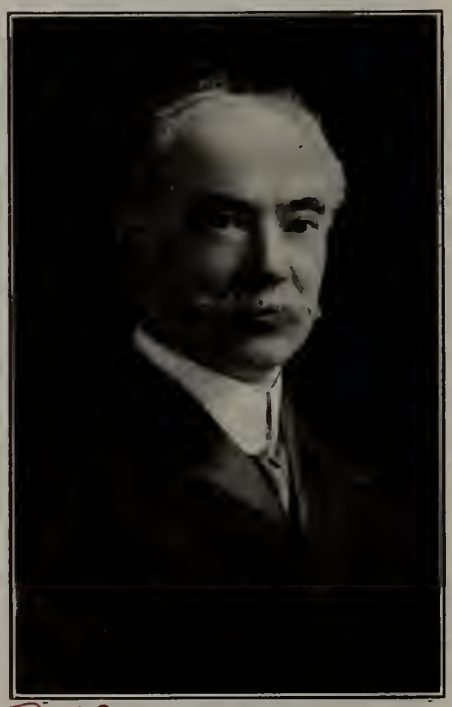
ALEX SHIELDS, who resigned his position as General Master Mechanic, Canadian Northern Ry., a short time ago, and whose election of president of the Railroaders' Investment Co., has previously been mentioned in these columns, received a number of presentations on leaving the service, including a mahogany cabinet of solid silver from C.N.R. officers, a diamond ring from the locomotive engineers, a gold chain and locket from the machinists, and also gifts from the company's employes at Saskatoon and Edmonton. He has also been elected a director of the Consolidated Land Co.

A. HATTON, who was recently appointed Superintendent of Car Service, C.P.R. Western Lines, Winnipeg, was born in London, Eng., Apr. 12, 1869, and was from 1888 to 1891 in Central Ontario Ry. service; 1891 to May, 1896, operator, C.P.R.; May, 1896, to Sept., 1901, dispatcher, C.P.R.; Sept., 1901, to Jan., 1907, Chief Dispatcher, C.P.R., Fort William, Ont., Kenora, Ont., and Cranbrook, B.C.; Jan., 1907, to Feb. 12, 1912, Inspector of Transportation, C.P.R. Western Lines. He was then appointed acting Superintendent of Car Service, Western Lines, and was subsequently confirmed in that position.

GEORGE BLACK, Road Foreman of Locomotives, G.T.R., Stratford, Ont., who had been suffering for some time from gall stones, but shrunk from the advised operation on account of his inherent dread of the operating table, having finally decided to undergo the operation towards the end of April, died from heart failure, Apr. 28. He was born in Lincolnshire, Eng., and entered railway service there, with the Great Northern Ry., as engine wiper, and was later a spare foreman. In Canada he has been employed as a wiper, foreman, locomotive driver, and from Oct., 1902, to Apr. 28, 1912, as Road Foreman of Locomotives, G.T.R., at Stratford, Ont. He was 48 years of age.

J. C. HOLDEN, whose appointment as Division Engineer, Manitoba Division, C.P.R., Winnipeg, was announced in our last issue, was born at St. John, N.B., Feb., 1876, and educated at Bishop's College school, Lennoxville, Que., and Royal Military College, Kingston, Ont. His service covers reconnaissance work for the Militia Department in the summer of 1896; harbor improvements and survey at St. John, N.B., Sept., 1896, to Jan.. 1897. and during the summer of 1897, preliminary surveys, Intercolonial Ry.; Jan., 1898, to Apr., 1903, reconnaissance, preliminary, location and construction work, C.P.R.; Apr., 1903, to 1907, Resident Engineer, Maintenance of Way, C.P.R.; 1907, to Apr., 1912, Assistant Engineer of Maintenance of Way, C.P.R.

F. W. HUNTINGTON, General Agent, Passenger Department, C.P.R., Minneapolis, St. Paul and Sault Ste. Marie Ry., and Duluth, South Shore and Atlantic Ry., Philadelphia, Pa., died there, May 11, after having undergone an operation for gall stones. He was born in 1854, and entered railway service at 15 years of age, going through active ticket office experience with the Chicago, Milwaukee and St. Paul Ry., in Minneapolis, Minn., subsequently serving with the Great Northern Ry., the Pennsylvania Rd., and the C.P.R. He was in C.P.R. service for about 18 years as Travelling Passenger Agent, and latterly as General Agent, Passenger Department at Philadelphia, Pa.



P279 A. S. Goodeve,
Member of the Board of Railway Commissioners.

R. COLCLOUGH, who has been appointed Assistant Superintendent, Halifax and St. John District, Intercolonial Ry., Moncton, N.B., was born at Bic, Que., Feb. 24, 1871, and educated at Rimouski college and Laval University, whence he graduated with the degree of B.A. in 1888. He entered the I.R.C. service, Dec. 9, 1889, since when he has been; to Nov., 1892, clerk in Chief Superintendent's office, Moncton, N.B.; Nov., 1892, to Nov., 1901, private secretary to Chief Superintendent, General Manager, General Superintendent and Manager; Nov., 1901, to Oct., 1902, chief clerk, Manager's office; Oct., 1902, to June, 1911, clerk in General Manager's office, and office of Managing Board; June 1, 1911, to May 1, 1912, chief clerk in General Superintendent's office.

H. H. ADAMS, whose resignation as General Manager, Toronto, Hamilton and Buffalo Ry., Hamilton, Ont., to accept the presidency of the Kansas City Terminal Ry., Kansas City, Mo., was announced in our last issue, was born at Detroit, Mich., Aug. 13, 1876, and entered railway service July, 1899, as rodman and draughtsman, M.C.R. After serving in various capacities in the engineering department, he was appointed Assistant Chief Engineer, Mar., 1902; secretary to the General Superintendent, Nov., 1902; Assistant Superintendent, Canadian Division, M.C.R., Jan., 1904; General Superintendent, Toronto, Hamilton and Buffalo Ry., Hamilton, Ont., Oct., 1909, and General Manager, same road, Oct., 1910. He left Hamilton, May 6, to take up his new duties.

A. S. GOODEVE, whose appointment as a member of the Board of Railway Commissioners was announced in our last issue, and whose portrait appears in this issue, was born at Guelph, Ont., Dec. 15, 1860, and educated at the Guelph public and high schools He is a graduate and medallist of the Ontario College of Pharmacy, and was in business as a druggist at Chesley, Bruce County, Ont., from 1884 to 1896. He went to Rossland, B. C., in 1896. In the same business, and was for three years a member of the city council, and mayor in 1899-1900. In 1902 he was Provincial Secretary of British Columbia; 1909-10, member of the B.C. Forestry Commission; elected to the Dominion Parliament for Kootenay, in 1908, and made Conservative Western whip, and assitant chief whip in 1911.

C. G. WASHBON, whose appointment as Resident Engineer, C.P.R., Winnipeg, was announced in our last issue, was born at Morris, N.Y., Nov. 27, 1887, and was educated at the Rensselaer Polytechnic Institute, Troy, N.Y., taking the four years' civil engineering course. He entered railway service in the summer of 1906, as rodman, C.P.R., Winnipeg, and also served with the C.P.R. in the summer of 1907. In the summer of 1908, he was engaged on location work with the Buffalo, Rochester and Pittsburgh Ry., at Dubois, Pa., and continued in the same service in 1909; 1909, to Apr., 1910, in charge of construction of Twin Tree Lumber Co.'s logging railway, Maplesville, Ala.; Apr., 1910, to Apr., 1912, transit man, C.P.R., Brandon, Man. He is a member of the Delta Tau Delta fraternity.

J. W. EBER, who has been appointed General Superintendent, Toronto, Hamilton and Buffalo Ry., Hamilton, Ont., entered railway service in 1890, since when he has been, to 1902, rodman, draughtsman, transitman and Supervisor of Track, West Shore Rd.; 1902 to 1904, in charge of the main line division, New York Central Lines, Albany, N.Y.; 1904 to 1905, Division Engineer, Rome, Watertown and Ogdensburg Division, New York Central Lines; 1905 to 1909, Assistant Engineer of Maintenance of Way and Engineer of Track, of the entire New York Central system, his territory covering nearly 4,000 miles of road; 1909 to 1910, Superintendent, New York Central Stockyards and Terminals, Buffalo, N.Y.; 1910 to May 14, 1912, Superintendent, Adirondack Division, New York Central Lines, Utica, N.Y.

R. H. L'HOMMEDIEU, who has resigned as General Manager, Michigan Central Rd., Detroit, Mich., was born at Cincinnati, Ohio, Dec. 29, 1850, and entered railway service in 1870, since when he has been, to 1872, apprentice in locomotive shops, Cincinnati, Hamilton and Dayton Ry.; 1872 to 1873, clerk, Division Superintendent's office, Chicago,

Burlington and Quincy Rd.; 1873 to 1879, Trainmaster, Michigan Central Rd.; 1879 to 1890, Superintendent, Western Division, M.C.R., Chicago, Ill.; Sept., 1890, to Apr., 1896, Assistant General Superintendent, same road; in Apr., 1896, he was appointed General Superintendent, and was subsequently appointed General Manager. He has been appointed Assistant to the Vice President, M.C. Rd., Detroit, Mich., and will take up his duties after a short vacation.

C. R. HEATH, whose appointment as Superintendent of Water Service, Grand Trunk Pacific Ry., Melville, Sask., was announced in our last issue, was born at La Salle, Ill., Oct. 3, 1873. He comes of a railroading family, though his present position is practically his first railway work. On leaving school he was engaged in irrigation construction work in Colorado, until 1902, when he was appointed engineer of construction. National Construction Co., South Bend, Ind., remaining there until 1907, when he engaged in private business as consulting engineer, making a specialty of water supply, especially in regard to the western plains section of the North American continent. Immediately prior to his present appointment he was engaged, from the latter part of 1911, in special water service work for the G.T. Pacific Ry.

JULES HONE, who has been appointed Dominion Government director, G.T. Pacific Ry., to succeed A. Brunet, was born at Montreal, Sept. 8, 1874, and entered C.P.R. service in the Car Accountant's office, Montreal, Mar. 14, 1889, where he continued until July, 1890, since when he has been, to Aug., 1891, secretary to Manager of Transportation, Montreal; Aug., 1891, to the summer of 1892, in city ticket office, Montreal. 1892, to July 4, 1893, chief clerk, city ticket office, Ottawa; July 4, 1893, to June 21, 1896, assistant to chief clerk, city ticket office, Montreal; June 21, 1896, to Nov. 1, 1903, ticket agent, Windsor Hotel, Montreal; Nov. 1, 1903, to 1906, City Passenger, Freight and Steamship Agent, Quebec; 1906, to Apr., 1911, City Passenger and Ticket Agent, Quebec, since which latter date he has conducted a general ticket agency in partnership, in Quebec and Montreal.

W. E. DUPEROW, who has been appointed General Agent, Passenger Department, G.T.R., G.T. Pacific Ry. and G.T. Pacific Coast Steamship Co., Vancouver, B.C., was born at Stratford, Ont., Sept. 4, 1872, and entered transportation service, Nov. 3, 1893, since when he has been, to Oct. 15, 1894, in G.T.R. service at Seaforth, Ont.; Oct. 15, 1894, to June 1, 1896, ticket clerk, G.T.R., London, Ont.; June 1, 1896, to July 11, 1898, ticket clerk, G.T.R., Toronto. July 11, 1898, to Aug. 1, 1899, theatrical and excursion clerk, District Passenger Agent's office, G.T.R., Toronto; Aug. 1, 1899, to Apr. 19, 1902, chief clerk, same office; Apr. 19, 1902, to Feb. 15, 1907, General Manager, Secretary and Treasurer, Huntsville, Lake of Bays and Lake Simcoe Navigation Co., Huntsville, Ont.; Feb. 15, 1907, to June 1, 1910, Travelling Passenger Agent, G.T.R., Toronto; June 1, 1910, to Apr. 15, 1912, City Passenger and Ticket Agent, G.T.R. and G.T.P.R., Victoria, B.C.

The body of C. M. HAYS, President, G.T.R. and G.T.P.R., who was lost in the Titanic disaster, was recovered by the Mackay-Bennett cable steamship Minia, and landed at Halifax, N.S., on May 6, where it was received by D. H. Hays, a brother, H. G. Kelley and R. S. Logan, Vice Presidents, G.T.R.; Dr. J. A. Hutcheson, Chief Medical Officer, and other officials. It was immediately placed on a special G.T.R. train which had been waiting at Halifax for several days, and which reached Bonaventure station, Montreal, May 7, where it was met by a large number of the company's chief officials. The funeral, which, at Mrs. Hays' request, was of as private a nature as possible, took place the next day to Mount Royal Cemetery. The G.T.R. offices were closed for a portion of the afternoon so that the heads of departments, etc., might attend, and there were a number of other prominent citizens present, including a representative of the Governor-General.

J. A. HEAMAN, whose appointment as Division Engineer, Grand Trunk Pacific Ry., Fitzhugh, Alta., was announced in our last issue, was born at Memphis, Tenn., June 3, 1874, and educated in the public schools and Collegiate Institute, London, Ont., and McGill University, Montreal. He entered railway service Apr., 1901, since when he has been, to Apr., 1902, instrument man, G.T.R. double track construction; Apr. to Nov., 1902, Resident Engineer on Construction, G.T.R.; Nov., 1902, to Nov., 1903, Resident Engineer on Maintenance, G.T.R.; Nov., 1903, to May, 1905, Assistant Engineer, G.T. Pacific Ry. location east of Winnipeg; May, 1905, to Nov., 1907. Assistant Engineer in charge of location and construction, National

P288 G. S. Hodgins, M. Am. Soc. M.E.,
Consulting Engineer, National Transcontinental Railway.

Transcontinental Ry.; Nov., 1907, to Oct., 1908, Assistant District Engineer, National Transcontinental Ry.; Oct., 1908, to June, 1910, Assistant District Engineer, G.T. Pacific Ry., June, 1910, to Apr., 1911, District Engineer, G.T. Pacific Ry.; Apr., 1911, to Apr., 1912, Office Engineer, G.T. Pacific Ry.

G. A. KEEFER, M. Can. Soc., C.E., who died at Victoria, B.C., May 19, was born at Cornwall, Ont., Sept. 10, 1836, and educated at St. Catharines, Ont., and Upper Canada College. He entered railway service in 1853, and to 1857 was engaged on survey work between Montreal and Cornwall for the G.T.R.; 1857 to 1861, engaged in architecture and work on the Victoria Bridge; he was later engaged under his uncle, the late Samuel Keefer, on the Brockville and Ottawa Ry., and was subsequently, to 1875, with the Belleville Grand Jct. Ry, and the Belleville and North Hastings Ry., of which latter he became Chief Engineer. From 1875 to 1885 he was on survey work on the C.P.R. in the Rocky Mountains, on behalf of the Government; 1875 to 1885. Railway Inspector for the Government, in British Columbia; 1887 to 1899, in private practice; 1899 to the date of his death, Resident Engineer, Dominion Public Works Department, New Westminster, B.C. He was a son of the late G. K. Keefer, a well known civil engineer of Thorold, Ont., and a nephew of T. C. Keefer, C.M.G., Hon. M. Can. Soc. C.E., of Ottawa.

G. O. SOMERS, General Freight Agent, Chicago Great Western Rd., Chicago, Ill., is reported to be about to resign, in order to enter business in Toronto. He was born at Barrie, Ont., July 10, 1860, and entered railway service in 1875, since when he has been, to 1879, telegraph operator, Northern Ry.; assistant agent, relief agent, station agent and clerk to Superintendent, same road; from 1880 to 1882, he was in other business in Chicago; 1883 to 1885, successively, clerk in General Freight Department, acting General Baggage Agent and chief clerk, General Passenger and Ticket Department, C.P.R., Winnipeg; 1886, chief clerk, general passenger and ticket office, Michigan Central Rd., Chicago, Ill.; 1887, Travelling Passenger Agent, Duluth, South Shore and Atlantic Ry., Marquette, Mich.; 1887 to Sept., 1894, successively, chief clerk, general passenger and ticket office, chief clerk, general traffic department, and Assistant General Freight Agent, Great Northern Ry.; in Sept., 1894, he was appointed General Freight Agent, Great Northern Ry., and later transferred to a similar position on the Chicago Great Western Rd.

A. J. ISBESTER, who has been appointed Assistant District Engineer, Port Arthur District, Canadian Northern Ontario Ry., Port Arthur, is a son of the late Jas. Isbester, one of the first contractors on the C.P.R. He was born at Ottawa Dec. 18, 1879, and educated at Ottawa Collegiate Institute and Toronto University, graduating in 1902. His railway service is from May 1 to Sept. 30, 1900, rodman, Algoma Central and Hudson Bay Ry.; May, 1902, to Jan., 1903, instrument man on construction of Ottawa Northern and Western branch, C.P.R., from Gracefield to Maniwaki; Jan. to Dec., 1903, transitman in the prairie provinces and British Columbia, and Resident Engineer, Yorkton extension, C.P.R.; Jan. to June, 1904, transitman, C.P.R. Toronto-Sudbury branch between Romford Jct. and Byng Inlet; July, 1904, to Mar., 1906, Resident Engineer on construction, same branch; Apr., 1906, to Mar., 1909, Assistant Engineer in charge of tracklaying, trestles, ballasting, etc., same branch; May, 1909, to June, 1911, engaged in contracting on the National Transcontinental Ry.; July, 1911, to Mar., 1912, Division Engineer, Port Arthur District, Canadian Northern Ontario Ry., Port Arthur.

W. PHILLIPS, who has been appointed European Traffic Manager, Canadian Northern Ry. and Canadian Northern Steamships, Ltd., London, Eng., was born at Toronto, Jan. 31, 1870. He entered transportation service Apr., 1886, since when he has been, to Mar. 31, 1896, in G.T.R. offices, Toronto; Apr. 1, 1896, to Feb. 28, 1902, North West Agent, North West Transportation Co., Winnipeg; on Jan. 1, 1907, he was also appointed General Agent, Chicago Great Western Ry.; and on Apr. 1, 1900, North West Agent, Northern Navigation Co., there, which positions he held to Feb. 28, 1902; Feb. to Apr., 1902, General Agent, Freight and Passenger Departments, Canadian Northern Ry., Toronto; Apr., 1902, to May, 1911, General Eastern Agent, Canadian Northern Ry., Toronto; Nov., 1906, he was also appointed General Freight and Passenger Agent, Canadian Northern Ontario Ry., and in Apr., 1910, also acting Traffic Manager, Canadian Northern Steamships, Ltd., and in Apr., 1911, this latter position was changed to General Freight and Passenger Agent, Canadian North-

ern Steamships, Ltd.; May, 1911, to May, 1912, he was General Freight Agent, Canadian Northern Ontario Ry., Central Ontario Ry., Bay of Quinte Ry., Irondale, Bancroft and Ottawa Ry., and Niagara, St. Catharines and Toronto Ry. and Navigation Cos., and General Freight and Passenger Agent, Canadian Northern Steamships, Ltd., Toronto.

F. W. PETERS, who has been appointed General Superintendent, British Columbia Division, C.P.R., Vancouver, was born at St. John, N.B., Mar. 25, 1860, and entered railway service in 1873, as telegraph operator with engineers on construction, Intercolonial Ry., and from 1873 to 1876 acted as agent at Jacquet River and other points, same road; 1876 to 1878, assistant agent at Newcastle, N.B., same road; 1878 to 1880, agent, Chatham Jct., N.B., same road; 1880 to Nov., 1881, relieving agent, Chicago and Grand Trunk Jct. Ry., Fort Gratiot, Mich.; Nov., 1881, to May, 1882, billing clerk, local freight office, C.P.R., Winnipeg. May, 1882, to Apr., 1889, agent, C.P.R., Brandon, Man., April to June, 1889, agent, C.P.R., Fort William, Ont.; June, 1889, to Nov., 1896, Local Freight Agent, C.P.R., Winnipeg; Nov., 1896, to 1899, District Freight Agent, West Kootenay District, C.P.R., Nelson, B.C.; 1899 to Dec., 1900, Assistant General Freight Agent, same territory, Nelson, B.C.; Dec., 1900, to July, 1901, Assistant General Freight Agent, Pacific Division, C.P.R., Vancouver, B.C.; July, 1901, to Dec. 31, 1902, General Freight Agent, same divisio C.P.R., Vancouver, B.C.; Jan. 1, 1903, to Mar. 1, 1908, Assistant Freight Traffic Manager, Western Lines, C.P.R., Winnipeg; Mar. 1, 1908, to May, 1912, Assistant to Second Vice President, and on the abolition of the numerical designations of the Vice Presidents, Assistant to the Vice President, C.P.R., Winnipeg.

LOUIS K. JONES, I.S.O., Secretary Department Railways and Canals, who has also recently been appointed Assistant Deputy Minister, and whose portrait appears in this issue, was born at Cobourg, Ont., June 9, 1849, and educated at Trinity College School, Weston, Ont., and Trinity College University, Toronto. He entered government service as clerk to the secretary of the Canal Commission, in 1870, and joined the staff of the District Engineer on the construction of the Intercolonial Ry. in the Miramichi district, Newcastle, N.B., in 1871. In 1874 he was appointed secretary to Collingwood Schreiber, on the latter's appointment as Chief Engineer, Intercolonial Ry., with headquarters at Ottawa, and remained in that position until the completion of the road, continuing with Mr. Schreiber on the latter's appointment as Chief Engineer and General Manager of the government railways, and from 1880, on Mr. Schreiber's additional appointment as Chief Engineer on construction of the C.P.R., during the building of a portion of that road by the government, Mr. Jones was Assistant to the Chief Engineer and General Manager, government railways. From 1888 to 1891, in addition to performing his departmental duties, he was secretary to the arbitration board which dealt with the C.P.R. claim against the government in connection with the Onderdonk section of the road, involving some six or seven million dollars. From 1893 to 1897 he was chief clerk, Department of Railways and Canals, and in 1897 was appointed Secretary of the Department. He was awarded the Imperial Service Order for long and faithful service.

W. WAINWRIGHT, Vice President, G.T.R., who has been promoted from Second Vice President to First Vice President, G.T. Pacific Ry., and whose portrait appears in this issue, was born at Manchester Eng., Apr. 30, 1840, and entered railway service, Jan., 1858, with the Manchester, Sheffield and Lincolnshire Ry., serving successively as junior clerk in the Chief Accountant's office, senior clerk in the same office, secretary to Assistant General Manager, and secretary to General Manager. In 1862 he joined the G.T.R. staff, serving one year as senior clerk in the Accountant's office, three years as secretary to the Managing Director, six years as senior clerk to the Managing Director, and in charge of the car mileage department, eight years and five months as General Passenger Agent; May, 1881, to May, 1890, Assistant Manager; May, 1890, to May, 1896, Assistant General Manager; from Apr., 1883, to Sept., 1895, also General Manager, North Shore Ry.; May, 1896, to July, 1907, General Assistant; Dec., 1900, to July, 1907, also Comptroller; July, 1907, to Jan. 7, 1910, Fourth Vice President; Jan. 7, 1910, to Oct. 2, 1911, Second Vice President, also Second Vice President, G.T.P.R.; Oct. 2, 1911, appointed Vice President G.T.R., on the abolition of numerical designations, which position he continues also to hold. On the death of C. M. Hays, recently, he was placed in chief charge of the G.T.R affairs, pending the appointment of a president. He is a director of the Guarantee Co. of North America; director, Montreal Telegraph Co.; Vice President, Richelieu and Ontario Navigation Co.; Vice President, Grand Trunk Insurance and Provident Society; director, Canadian Express Co., and of various G.T.R. subsidiary lines. He was for eight years in command of a company of artillery in the old Grand Trunk Brigade, and retired with the rank of captain on its disbandment.

GEO. SHERWOOD HODGINS, who has recently been appointed Consulting Mechanical Engineer, National Transcontinental Ry., with headquarters at Ottawa, as mentioned in our last issue, is the third son of Dr. J. George Hodgins, of the Ontario Educational Department. He was born at Toronto and educated at Upper Canada College and at the School of Practical Science, Toronto. He began work in the Canadian Locomotive and Engine Co., of Kingston, Ont., in June, 1881. After working there for some years he became chief draughtsman. While in the service of this company he inspected and selected machinery and other equipment in England which the company contemplated buying. In 1884 he began railway work, entering the office of the Master Mechanic of the Ontario and Quebec Division, C.P.R., at Toronto. In 1886 he was transferred to the Pacific Division as Locomotive Foreman at Vancouver. In 1890 he returned to the Ontario and Quebec Division. From 1898 to 1900 he was Locomotive Inspector for the whole C.P.R. system and superintended the construction of locomotives and cars which were built in the U.S. He also tested locomotive performance on the road over the various divisions and did other mechanical engineering work for the company. In 1900 he returned to the locomotive works at Kingston as Mechanical Engineer, and when these works closed down for a time he went into technical journalism in New York City, being connected in an editorial capacity with The Railroad Digest, The Railroad Gazette, Railway Machinery, and Railway and Locomotive Engineering. Last year he gave up editorial work and went abroad for the summer, returning at the close of 1911. He is a member of the American Society of Mechanical Engineers, the Master Mechanics' Association, the Canadian Society of New York and the University of Toronto Club of New York. In 1890 he married the youngest daughter of the late Mr. Justice Patterson, of the Supreme Court of Canada. Although he lived for some time in the U.S., he has not given up his Canadian nationality.

Great Northern Railway Lines in Canada.

Midland Ry. of Manitoba—Midland Great Northern Ry.—The company began operating its trains over its own line into its own freight terminals and its passenger trains into the Fort Garry union station at Winnipeg, May 1. The line is being used by the G.N. Ry. and the Northern Pacific Ry., and the entry into the union station is obtained by an agreement with the Canadian Northern Ry.

Vancouver, Victoria and Eastern Ry. and Navigation Co.—Press reports state that the contractors on the line at Hope, B.C., were directed by the Chief Engineer, May 9, to proceed with the rock work at once. This refers to the building of the line through the Coquihalla River valley.

Vancouver Improvements—The pile driving for the dock on Burrard Inlet, Vancouver, has been completed by the Chase Co., which had the contract, and the contractors for the concrete work, Cummings and Keihl, of Seattle, Wash., have started work. The dock will be 350 ft. wide and 450 ft. long, and will consist of two slips each 75 ft. wide, the intervening space of 200 ft. being filled so as to permit the laying of tracks and the building of two sheds each running the full length of the dock.

The plans for the terminals on False Creek, Vancouver, for the joint use of the G.N. Ry. and the Northern Pacific Ry., which are being worked out, will mean a great change in the appearance of the locality. Measuring from Main St. to the extreme east end of the area embraced in the scheme, the distance is about a mile. In breadth, from Prior St. to Seventh Ave. the distance is about 3,500 ft. In the centre of this, there is a basis 4,300 by 1,600 ft. wide reserved by the city. This is to be bulkheaded with concrete and dredged so that it will be navigable at all times of day and at all seasons of the year. About this basin the yards, shops, freight sheds, repair tracks, store houses, passenger tracks and station are to be located. There is ample room for all of these which will be sufficient for transacting an enormous business. The passenger station is 250 by 160 ft. It will house all of the offices of the company. The plan provides for the construction of an express house 600 ft. long, one freight house 2,000 ft. long, another 1,950 ft. long, 10 tracks for the receiving of trains and the distribution of cars, team tracks, freight house tracks, repair tracks, a round house and turn table, passenger tracks, coal supply, water tanks, oil tanks, industrial tracks, coach tracks, and three overhead crossings

NOTICE TO CONTRACTORS.

TENDERS will he received by the undersigned for the substructures and superstructures of ten (10) bridges over the Fraser, Thompson and North Thompson Rivers on that section of the Canadian Northern Pacific Railway between Port mann and the Yellowhead Pass, Province of British Columbia.

Tenders are to include any or all portions of the construction or the delivery of metalwork only.

Detailed drawings, specifications, and forms of contract may be obtained on or after June 5th, 1912, at the office of the Consulting Engineers, Waddell & Harrington, Winch Building, Vancouver, B.C., upon the payment therefor of fifty (50) dollars. This amount will be refunded to those who bid on the work, upon the return of the bidding papers in good condition.

Total work to be completed before June 1st, 1913.

Tenders to be received at the offices of the undersigned, Metropolitan Building, Vancouver, B.C., not later than noon of July 8th, 1912, and to be enclosed in sealed envelopes marked "Tender for Bridge Construction."

The lowest or any tender not necessarily accepted.

MACKENZIE, MANN & COMPANY, LTD.

Transportation Appointments Throughout Canada.

The information under this head, which is almost entirely gathered from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who may notice any error in our announcements will confer a favor by advising us.

Algoma Central and Hudson Bay Ry, Algoma Eastern Ry.—J. A. HEDGECOCK, Assistant Engineer in charge of terminal work, has also been appointed Bridge Engineer, vice C. R. Boucher, deceased. Office, Sault Ste. Marie, Ont.

British Columbia Electric Ry.—ALLAN PURVIS, formerly Local Manager, Fraser Valley Branch, has been appointed Manager of Interurban Lines. Office, New Westminster.

E. STERLING, heretofore Division Trainmaster, New Westminster, has been appointed Superintendent, District 2, covering Lulu Island and Eburne-New Westminster lines; District 3, covering Fraser Valley Branch. Office, New Westminster.

W. H. ELSON, heretofore Trainmaster, Interurban Lines, New Westminster, Lulu Island and Eburne, has been appointed Superintendent, District 1, covering Vancouver-New Westminster interurban line; District 4, covering Burnaby Lake line; New Westminster city lines and terminals at New Westminster and Carrall St., Vancouver. Office, Vancouver.

Canadian Northern Quebec Ry., Quebec and Lake St. John Ry.—G. SEAMAN, at one time General Roadmaster, Halifax and South Western Ry., Bridgewater N. S., has been appointed Bridge and Building Master, C.N.Q.R. and Q. and L. St. J. R., vice L. P. McGee, acting Bridge and Building Master, assigned to other duties. Office, Joliette, Que.

Canadian Northern Ry—H. J. COWIE, European Freight Agent, Canadian Northern Ry., and General Freight Agent, Canadian Northern Steamships, Ltd., Liverpool, Eng., has resigned.

W. PHILLIPS, heretofore General Freight Agent, Canadian Northern Ontario Ry., and subsidiary companies, and General Freight and Passenger Agent, Canadian Northern Steamships, Ltd., has been appointed European Traffic Manager, Canadian Northern Ry. and Canadian Northern Steamships, Ltd., in charge of freight and passenger traffic for Great Britain and the European continent. Office, London, Eng.

R. L. FAIRBAIRN, heretofore Assistant General Passenger Agent, lines east of Port Arthur, in Ontario and Quebec, has been appointed General Passenger Agent same territory, including affiliated lines. He has also been appointed General Passenger Agent, Canadian Northern Steamships, Ltd., vice W. Phillips, promoted. Office. Toronto.

F. A. YOUNG, heretofore Commercial Agent, Chicago, has been appointed Division Freight Agent, lines east of Port Arthur and west of Ottawa, including leased and affiliated lines, vice W. Phillips, General Freight Agent, promoted. Office, Toronto.

A. E. HODGINS, heretofore Travelling Freight Agent, Pittsburgh, Pa., has been appointed General Agent there, sucseeding R. H. Bell, Commercial Agent, transferred.

R. H. BELL, heretofore Commercial Agent at Pittsburg, Pa., has been appointed General Agent at Chicago, Ill., vice F. A. Young, Commercial Agent, promoted.

C. DYER has been appointed Assistant Local Freight Agent, Winnipeg, vice C. H. Booth, resigned to enter Midland Ry. of Manitoba service, as announced in our last issue.

Canadian Pacific Ry.—The territory of the district master mechanics of the Eastern Division has been re-arranged into three districts, instead of four, as follows—District 1, covering Outremont, Farnham, Sortin, Sherbrooke, Megantic, Newport and branches, in charge of H. A. PEPLER, heretofore District Master Mechanic, District 2 and Montreal Terminals, Montreal, vice J. D. Wells, who returns to his former position as locomotive driver. Office, Montreal. Districts 2 and 4, covering Ottawa, including Ottawa and New York Ry. junction, Smiths Falls, Glen Yard, Brockville and Prescott, in charge of J. M. BURKE, heretofore District Master Mechanic, District 4. Office, Ottawa. District 3, covering Quebec, Three Rivers, Hochelaga, Waltham, Manawaki and Laurentian subdivision, and Outremont, as far as locomotives on that run are concerned, in charge of W. BORBRIDGE, as heretofore. Office, Montreal.

W. TANSLEY, heretofore Chief Dispatcher, Havelock, Ont., has been appointed Assistant Superintendent, District 1, Ontario Division. Office, Havelock.

J. W. WANSBOROUGH has been appointed Chief Dispatcher, District 1, Ontario Division, vice W. Tansley, promoted. Office, Havelock.

A. E. STEWART, heretofore District Master Mechanic, District 2, Ontario Division, West Toronto, has been appointed, temporarily, Superintendent of Construction, with headquarters at Lindsay, Ont.

P281 F. W. Peters,
General Superintendent, British Columbia Division, Canadian Pacific Railway.

A. MAYNES, heretofore District Master Mechanic, District 1, Ontario Division, has been appointed District Master Mechanic, District 2, Ontario Division, vice A. E. Stewart, transferred to Construction Department, temporarily. Office, West Toronto.

W. PICKRELL, heretofore acting District Master Mechanic, District 3, has been appointed District Master Mechanic, District 1, vice A. Maynes, transferred. Office, West Toronto.

S. ILLINGSWORTH has been appointed locomotive foreman, West Toronto, Ont., vice W. C. Mayo, promoted.

R. MCLAUGHLIN, heretofore fitter, has been appointed assistant night foreman, West Toronto shops.

W. C. MAYO, heretofore night locomotive foreman, West Toronto, has been appointed Locomotive Foreman at Port McNicoll, Ont.

P. WELLIGAN, heretofore clerk in General Baggage Department, Winnipeg, has been appointed General Travelling Baggage Agent, Winnipeg, vice W. E. Allison, promoted.

R. MCPHERSON, heretofore shop foreman at Kenora, Ont., has been appointed shop foreman at Brandon, Man.

W. J. RENIX, heretofore shop foreman at Brandon, Man., has been appointed shop foreman at Moose Jaw, Sask.

T. S. BERTRAM, heretofore night foreman at Kenora, Ont., has been appointed night foreman at Moose Jaw, Sask., vice A. Pentland, transferred.

A. PENTLAND, heretofore night foreman at Moose Jaw, Sask., has been appointed night foreman at Swift Current, Sask.

W. E. ALLISON, heretofore General Travelling Baggage Agent, Winnipeg, has been appointed District Baggage Agent, Alberta Division, vice E. V. Dangerfield, resigned. Office, Calgary.

J. F. SWEETING, heretofore Industrial Agent, attached to the Vice President's office, Winnipeg, has been appointed Industrial Agent for Western Lines, Department of Natural Resources. Office, Calgary, Alta.

JAS. DUFF, A.M. Can. Soc. C.E., has been appointed General Townsite Agent, Department of Natural Resources, vice J. L. Doupe, resigned. Office, Calgary, Alta.

A. CLARK has been appointed storekeeper at East Calgary, Alta., vice J. Paxton, resigned.

S. E. HOLLYMAN, heretofore chief clerk, Division Freight Agent's office, Regina, Sask., has been appointed Travelling Freight Agent, Lethbridge, Alta., vice C. S. Morse, promoted to District Freight Agent, Fort William, Ont., as announced in our last issue.

B. WILSON has been appointed storekeeper at Strathcona, Alta.

P. F. WEISBROD, Trainmaster at Cranbrook, B.C., was on Apr. 17 appointed Trainmaster at Macleod, Alta., vice A. C. Harshaw, transferred; and on May 9 he was appointed Superintendent, District 2, Saskatchewan Division, vice A. E. Stevens, promoted. Office, Moose Jaw.

J. P. KELLY has been appointed acting Locomotive Foreman at Field, B.C., vice W. B. Steeves, resigned.

C. HOOD, heretofore Terminal Trainmaster, Calgary, Alta., has been appointed Trainmaster at Cranbrook, B.C., vice P. F. Weisbrod, transferred.

F. W. PETERS, heretofore Assistant to the Vice President, Winnipeg, has been appointed General Superintendent, British Columbia Division, vice Jas. Oborne, deceased. Office, Vancouver.

A. E. STEVENS, heretofore Superintendent, District No. 1,, Saskatchewan Division, Moose Jaw, has been appointed Assistant General Superintendent, British Columbia Division. Office, Vancouver.

Fredericton and Grand Lake Coal and Ry. Co.—H. W. D. ARMSTRONG, M. Can. Soc. C.E., has been appointed Chief Engineer, vice D. F. Maxwell, resigned. Office, Fredericton, N.B.

Delaware and Hudson Co.—W. H. WILLIAMS, Third Vice President, New York, has been elected a director, vice J. J. Astor, deceased.

Grand Trunk Pacific Ry. — E. J. CHAMBERLIN, heretofore Vice President and General Manager, has been appointed President, G.T.P. Ry., and also of the G.T.R., vice C. M. Hays, deceased.

W. WAINWRIGHT, heretofore Second Vice President, has been appointed First Vice President.

M. M. REYNOLDS, heretofore Third Vice President, has been appointed Second Vice President.

JULES HONE, ticket agent, Quebec and Montreal, and formerly City Passenger and Ticket Agent, C.P.R., Quebec, has been appointed Dominion Government director, G.T. Pacific Ry., vice A. Brunet.

C. H. BROWN, heretofore Assistant Trainmaster, G.T.R., Hamilton, Ont., has been appointed a dispatcher, G.T.P.R., at Wainwright, Alta.

In announcing the appointments of W. E. DUPEROW and C. F. EARLE as General Agent, Passenger Department, Vancouver, and City Passenger and Ticket Agent, Victoria, respectively, in our last issue, the former's previous location should have been given as Victoria, as also that of the latter, who remains at Victoria.

The following agents have been appointed—Birmingham, Sask., G. A. Swan; Landis, Sask., F. W. Coulter; Chauvin, Alta., R. E. Patterson; Irma, Alta., R. B. Allen; Edson, Alta., J. S. Dobie.

Grand Trunk Ry—E. J. CHAMBERLIN, heretofore Vice President and General Manager, G.T. Pacific Ry., has been appointed President, G.T.R., and G.T.P.R., vice C. M. Hays, deceased. He has also been elected a director of the G.T.R. Co.

J. MCWOOD, heretofore General Foreman, car shops at London, Ont., has been appointed General Foreman, Car Department, Ottawa Division, vice W. Gillespie, appointed Master Car Builder, Central Vermont Ry., St. Albans, Vt., as announced in our last issue.

H. A. CARSON, heretofore Soliciting Freight Agent, Toronto, has been appointed Travelling Freight Agent, Toronto, vice R. Tinning, retired after 50 years' service.

F. G. GOULD, heretofore rate clerk, District Freight Agent's office, Toronto, has been appointed Soliciting Freight Agent, Toronto, vice H. A. Carson, promoted.

W. KIRKWOOD has been appointed Road Foreman of Locomotives, Middle and Southern Divisions, vice G. Black, deceased. Headquarters, Stratford, Ont.

The following agents have been appointed:—Beauharnois, Que., J. E. Pare; Oshawa Jct., Ont., A. A. Grant; Holland Landing, Ont., F. C. Laver; Guelph, Ont., W. F. Briggs; Gobles, Ont., B. P. Force; London, Ont., freight, D. W. Hayes; Alma, Ont., L. E. Dotzenroth; Goldstone, Ont., H. V. Goodwin; Paisley, Ont., C. E. Brigham; Neustadt, Ont., J. M. Fairweather; Hanover, Ont., J. E. Rlesberry; Wiarton, Ont., G. E. Smith; Atwood, Ont., F. Anguish; Stoney Point, Ont., H. A. Lampman; Belle River, Ont., F. W. Shearing; Tecumseh, Ont., F. Ouellette; Carlsbad Springs, Ont., F. A. Caillier; Ottawa, Ont., pass., A. G. Munroe; outside agencies, Amherstburg, Ont., A. W Marsh; Sault Ste. Marie, Ont., E. C. Miller; Toronto, W. J. Hamilton.

Great Northern Ry.—C. R. GRAY, heretofore President, Oregon Trunk Ry., Oregon Electric Ry., and Spokane and Inland Empire Rd., Portland, Oregon, is reported to have been appointed President, G.N.R., vice L. W. Hill, resigned. Office, St. Paul, Minn.

Hudson Bay Ry—A press dispatch from Le Pas, Man., says Chief Engineer Bruce, of the Dominion Hudson Bay Ry. has resigned. The dispatch is incorrect in regard to title, as J. Armstrong is Chief Engineer.

Intercolonial Ry.—W. A. FITCH, heretofore Chief Dispatcher at Sydney, N.S., has been appointed Assistant Superintendent, Sydney and Oxford District. Office, Sydney, N.S.

E. L. DESJARDINS, heretofore Chief Dispatcher, Levis, Que., has been appointed Assistant Superintendent, Montreal and Ste. Flavie District. Office, Riviere du Loup, Que.

A. E. WILKINSON, chief clerk, General Freight Agent's office, Moncton, N. B., has been appointed Division Freight Agent at Halifax, N.S., vice E. S. Smiley, assigned to other duties.

J. C. FULMORE, heretofore section foreman, Debert section, has been appointed Trackmaster from Oxford to Pictou, vice A. P. Giles, transferred. Office, Pictou, N.S.

J. HAMILTON has been appointed acting Trackmaster, Newcastle to Campbellton, N.B., during the absence through sickness of G. A. Fewcett.

E. SAVAGE has been appointed acting Trackmaster, Canada Eastern Division, during the absence through sickness of A. Astle.

L. S. BROWN, heretofore Chief Dispatcher, New Glasgow, N.S., has been appointed Assistant Superintendent, Moncton and Ste. Flavie District. Office, Newcastle, N.B.

R. COLCLOUGH, heretofore chief clerk, General Superintendent's office, Moncton N.B., has been appointed Assistant Superintendent, Halifax and St. John District. Office, Moncton, N.B.

A. P. GILES, heretofore Roadmaster, Oxford Jct., to Stellarton, at Westwell, N.S., has been appointed Trackmaster from Moncton to Newcastle, vice T. McPherson, promoted. Office, Newcastle, N.B.

Intercolonial Ry. and Prince Edward Island Ry.—T. MCPHERSON, heretofore Trackmaster from Moncton to Newcastle, I.C.R., Newcastle, N.B., has been appointed General Roadmaster, I.C.R., and P.E.I.R. Office, Moncton, N.B.

H. W. D. Armstrong, M. Can. Soc. C.E., Chief Engineer, Fredericton and Grand Lake Railway.

Michigan Central Rd.—E. D. BRONNER, heretofore Superintendent of Motive Power, Detroit, Mich., has been appointed General Manager, vice R. H. L'Hommedieu, resigned on account of ill health. Office, Detroit, Mich.

Minneapolis, St. Paul and Sault Ste. Marie Ry.—C. N. KALK, Principal Assistant Engineer, is in full charge of the Engineering Department, consequent on the recent death of T. Greene, Chief Engineer. Office, Minneapolis, Minn.

New York Central Lines.—J. J. BERNET, heretofore Assistant to the Vice President, L.S. and M.S. Ry., L.E. and W. Rd., L.E.A. and W. Rd., C.C.C. and St. L. Ry., P. and E. Ry., C.N. Rd., M.C. Rd., T. and C. Ry., Z. and W. Ry., and C.I. and S. Rd., has been appointed Assistant Vice President, same companies. Office, La Salle Station, Chicago, Ill.

Northern Navigation Co.—E. C. MILLER, heretofore City Passenger and Ticket Agent, Sault Ste. Marie, Ont., has been appointed District Freight and Passenger Agent, with territory, North Bay to Sault Ste. Marie, Ont., including Sault Ste. Marie, Mich., the Georgian Bay, Manitoulin Island and Mackinac Island. Office, Sault Ste. Marie, Ont.

F. MITCHELL, heretofore land steward, Collingwood, Ont., has been appointed Chief of Commissary, with full charge of the cabin departments on all the company's vessels, land stewards' offices at Collingwood and Sarnia, and the operation and linen at the company's laundry, Sault Ste. Marie, Ont. Office, Collingwood, Ont.

Northern Pacific Ry.—C. L. NICHOLS, heretofore General Superintendent, lines west of Paradise, Livingston, Mont., has been appointed General Superintendent, lines east of Paradise, St. Paul, Minn., vice E. C. Blanchard, promoted.

W. H. STRACHAN, heretofore Assistant Superintendent, Lake Superior Division, Duluth, Minn., has been appointed Superintendent at Jamestown, N.D., vice F. L. Birdsall, transferred.

F. L. BIRDSALL, heretofore Superintendent, Jamestown, N.D., has been appointed Superintendent at Missoula, Mont., vice A. M. Burt, transferred.

J. M. RAPELJE, heretofore Superintendent of the Idaho Division, Spokane, Wash., has been appointed General Superintendent, lines west of Paradise, Livingston, Mont., vice C. L. Nichols, promoted.

A. M. BURT, heretofore Superintendent, Missoula, Mont., has been appointed Superintendent, Idaho Division, Spokane, Wash., vice J. M. Rapelje, promoted.

Ottawa and New York Ry.—J. A. MCQUADE has been appointed Chief Dispatcher at Ottawa, Ont., vice E. J. Robertson, resigned.

Pacific Great Eastern Ry—With reference to the appointments of D'ARCY TATE as Vice President and General Counsel, and JOHN CALLAGHAN as Chief Engineer, we are officially advised that the office of the former is at Victoria, and that of the latter at Vancouver, B.C.

Philadelphia, Baltimore and Washington Rd. (Pennsylvania Rd.)—H. A. HAINES, heretofore Canadian Freight Agent, Pennsylvania Rd., Toronto, has been appointed Division Freight Agent, Baltimore, Md.

Prince Edward Island Ry.—H. MCEWEN, heretofore Train Dispatcher, has been appointed Superintendent, vice G. A. Sharp, retired. Office, Charlottetown, P.E.I.

W. S. POOLE, Mechanical Superintendent, is reported to have resigned.

Southern New England Ry., Southern New England Rd.—G. C. JONES, General Manager, Central Vermont Ry., St. Albans, Vt., has also been appointed Vice President, S.N.E. Ry., and S.N.E. Rd., in charge of construction and operation. Offices, St. Albans, Vt., and Grosvenor Bldg., Providence, R.I.

Southern Ry.—G. W. CARTER, heretofore City Ticket Agent, Richmond, Va., has been appointed Travelling Passenger Agent, Montreal, with office at 130 St. James St.

Toronto, Hamilton and Buffalo Ry.—J. W. EBER, heretofore Superintendent. New York Central and Hudson River Rd., Utica, N.Y., has been appointed General Superintendent, T., H. and B. Ry. Office, Hamilton, Ont. The resignation of H. H. Adams, General Manager, who was formerly General Superintendent, on his acceptance of the position of President, Kansas City Terminal Ry., Kansas City, Mo., was announced in our last issue.

The Alberta Ry. and Irrigation Company's railway has been taken over by the C.P.R., and is being operated as the Raymond subdivision of district 1, Alberta Division.

The Algoma Steel Co. is arranging to largely extend its plant at Sault Ste. Marie, Ont., and to practically double the capacity of the steel rail mill.

RAILWAY DEVELOPMENT.

Projected Lines, Surveys, Construction, Betterments, Etc.

Acadia Coal Co.—The Nova Scotia Legislature has amended the company's powers, and extended the time within which it may build certain railway lines authorized to connect its collieries with the Intercolonial Ry. (Sept. 1910, pg. 725.)

Alberta Interurban Ry.—The general location plan for the first section of this projected railway from Calgary, easterly and northerly to Carbon, Alta., have been approved by the Minister of Railways. The points served by the line on this section are:—Rocky View, Freshford (near), Irricana, Beiseker, and Carbon. This will carry the line to the Kneehills, where there are coal deposits, on which development work is being done.

We are officially advised that the line will be operated by individual power driven cars, no electricity being used at all for motive power purposes. The equivalent officials to station agents will be travelling backwards and forwards over the line in the cars. These officials will receive and deliver the freight out of the cars to each farmer who does business with the company. Each farmer will attend to his own business, giving a registerable lien for one month's freight charges to the company. It is said that this system has been found to work satisfactorily in the Southern States, and that it has been approved by the Dominion Railways Department.

At the shareholders' meeting held recently the various contracts and trust agreements to safeguard the unissued capital, and the contracts for construction were signed. The Land Traction Co., which financed the obtaining of the charters, has undertaken the construction of the line at cost plus 10% and a minor portion of the capital stock of the A.I. Ry. It is proposed by the L.T. Co. to sublet the work.

Following are the directors for the current year:—Vice President, C. S. Drummond, Calgary and London, Eng.; J. R. Sutherland, Winnipeg, Man.; W. F. W. Lent, and Major Duncan Stuart, Calgary, Alta. (May, pg. 251.)

Algoma Central and Hudson Bay Ry.—A contract is reported to have been let to Plant and Wright, for the building of a station at Sault Ste. Marie, Ont., at a cost of $100,000.

The Board of Railway Commissioners has authorized the building of an additional branch line from the company's Michipicoten branch. (May, pg. 238.)

Argenteuil Ry.—The Quebec Legislature has incorporated a company with this title to build a railway from the boundary between Harrington and Grenville to the canal at Grenville, Que. The provisional directors were named in our April issue.

The Quebec Legislature has voted a grant of 2,000 acres of land a mile for a line of 10 miles from the Grenville canal, going towards Arundel, Que. (April, pg. 181.)

Bagotville and St. Lawrence Ry.—The Quebec Legislature has incorporated a company with this title to build a railway from St. Alphonse or Grand Bay to Murray Bay, Que., with the provisional directors named in our Mar. issue. (Mar., pg. 120.)

Brandon Transfer Ry. — Brandon, Man., ratepayers have passed a bylaw to issue $12,000 of debentures to pay for right of way for the B.T. Ry., which has been built and is being operated in the interests of the three lines entering Brandon, viz., the C.P.R., Canadian Northern Ry., and Brandon, Saskatchewan and Hudson Bay Ry., a subsidiary of the Great Northern Ry., U.S. (Nov., 1911, pg. 1035.)

Bruce Mines and Algoma Ry.—The Ontario Legislature has passed an act declaring that notwithstanding any act or default of the company, its charter is still in force; authorizing the issue of bonds for $35,000 a mile of line constructed or projected, and granting an extension of time for the building of the line from the present northerly terminus at Rock Lake to the C.P.R. between Chapleau and Biscotasing stations, and thence northerly and easterly to Hannah Bay, or some other point on James Bay, Ont. (May, pg. 238.)

Buctouche and Rexton Ry—The New Brunswick Legislature has extended the time for building the railway from Buctouche to Rexton and thence to Richibucto Head, authorized to be constructed by chap. 91 statutes of 1905. (May, 1905, pg. 181.)

Burrard Inlet Tunnel and Bridge Co.—The North Vancouver, B.C., district council has passed a resolution agreeing to provide a further $25,000, making its contribution $125,000, towards the building of the bridge across the Second Narrows of Vancouver Inlet. The West Vancouver municipal council, April 30, discussed the question of the proposed tunnel under the second narrows, which is a part of the plans, and it was stated that while the company had the proposition under consideration the building of the bridge had been given first place. Some of the members of the council urged that the municipality should take up the work if the company did not proceed at once.

Press reports state that it is expected to make arrangements at an early date for the letting of contracts for the building of a line from Eburne to Deepcove, about five miles. (May, pg. 238.)

Canadian Terminal Ry.—The New Brunswick Legislature has extended the time for the building of the railway from L'Etang harbor to the St. Croix River, authorized to be constructed by chap. 60 statutes of 1907. (See Canada Atlantic Terminal Co., May, 1907, pg. 323.)

Central and North Eastern Ry.—The New Brunswick Legislature, in 1890, incorporated a company to build a railway from near St. John through the centre of the province, to a point on Northumberland Strait. At the last session the company's powers were revived, by an act which changed the provisional directors to W. W. Wells, F. B. Black, W. C. Milner, T. E. Murray, W. B. Dickson, W. H. Harrison, F. P. Robinson and H. A. Powell. The last three are new names, and the name of F. B. Black is substituted for that of J. L. Black. The company is given two years from July 1 to make surveys, and construction is to be started in a year thereafter, and completed by July 1, 1917

We are officially advised that the company is putting in a spur line at McAlpine, Ont., to connect with the C.P.R., in order to facilitate the delivery of construction material. All the construction on the line will be done by the general contractors, C. J. Willis and Sons, and the only work that will be sublet will perhaps be some clearing and grading.

The Board of Railway Commissioners has approved of location plans for the line from St. Eustache to Oka, Que., mileage 16 to 31.

Central Ry. of Canada.—The Minister of Railways has approved route maps from St. Eustache, Que., to South Indian, Ont., 70 miles. The Board of Railway Commissioners has approved plans and profiles of the company's line from St. Eustache, Que., to Hawkesbury, Ont., and has under consideration the plans and profiles from Hawkesbury to South Indian.

Ties, poles and fence posts are being delivered at McAlpine, Ont., where the company has a spur and siding connecting with the C.P.R. The right of way has been practically obtained from McAlpine to South Indian, and construction has been commenced between McAlpine and South Indian.

There has been deposited in the office of the Secretary of State at Ottawa the deed of trust made between the company and the City Safe Deposit and Agency Co., to secure the company's bonds. A meeting of the holders of bonds under this deed has been called, to be held in London, Eng., July 17, for the purpose of passing resolutions releasing the land grant subsidy for the security thereof upon terms of the bonds being converted into bonds guaranteed by the Dominion, Quebec or Ontario Government, or other consideration, and modifying the conditions under which the proceeds of the bonds are to be applied. (May, pg. 238.)

Chicago, Milwaukee and Puget Sound Ry., Oregon-Washington Rd. and Navigation Co.—It is reported that officers of these two companies have been discussing the basis of an arrangement which will settle various matters in connection with the building of lines in the northwest section of the State of Washington. and the extension of the same to Vancouver and other points in British Columbia. (May, pg. 120, and pg. 121.)

Dominion Atlantic Ry.—In connection with the proposed building of the projected North Mountain branch, we are officially advised that plans and profiles have been approved by the Board of Railway Commissioners. The line will connect with the company's Cornwallis Valley branch at Centreville, N.S., and will run in a generally westerly direction to Weston, about 15 miles. The line will cross 14 public roads at grade, and a resolution authorizing this has been passed by the council of King's County. The maximum gradient will be 1.5%, and the maximum curvature four degrees. The work will be comparatively light, and there will not be any heavy bridge work. Stations will be established at Belltown, Lakeville, Woodville, Grafton, Somerset and Weston. It has not been decided when construction will be started. (May, pg. 253.)

Edmonton, Dunvegan and British Columbia Ry.—We are officially advised that D. F. McArthur has the contract for the construction of this line from Edmonton to the Athabaska River, 120 miles. The clearing of the right of the right of way for 70 miles has been let. D. F. McArthur will grade the first 10 miles out of Edmonton. The contracts for the further grading have been let as follows: Porteus Bros, next 10 miles; next three miles, J. F. Cassels; next 10 miles, L. A. Johnson. Surveys are practically completed to the crossing of the Athabaska River, 120 miles, but the point of crossing has not been definitely fixed. Further clearing contracts are to be let, as required.

The plans for the entry of the line into Edmonton, and for the terminals, are not settled, but negotiations are in progress with the city and other interests. The steel for 120 miles has been ordered in the U.S., for June delivery. This will carry the line to the Athabasca River, which it is expected to reach by the end of the present season. T. Turnbull is Chief Engineer. (May, pg. 238.)

Elkhorn and Northern Ry.—The Manitoba Legislature has extended the time within which the line authorized to be constructed by chap. 92, statutes of 1910, may be built. (April, pg. 181.)

Eric, London and Tillsonburg Ry.—J. H. Teall, President, is quoted as stating that work on this projected railway will be started at an early date, so that application can be made to the Department of Railways for a contract under the act to aid the building of certain railways, the right to which will expire in August. The route proposed to be followed is from Port Burwell to London, via Corinth, Kingsmill and Belmont. It is expected to have the line built to Aylmer by Aug. 1.

We are officially advised that engineers are making surveys from Port Burwell, passing through Calton, Aylmer, Kingsmill and Belmont, and terminating in London, Ont.

Esquimalt and Nanaimo Ry.—A contract has been let to M. E. Hord, Victoria, B.C., for the construction of a 10 mile section from Courteney, south to Union Bay in the Comox district. Camps are being located on this mileage and every preparation made for pushing the work to a speedy completion. Tenders are reported to be under consideration for the construction of a 10 mile section northerly from McBride Jct., northerly towards Union Bay. This will leave a gap of about 25 miles, the right of way on which is being cleared, for which tenders will shortly be invited. A further section of the line north of Courteney to Campbell River will have to be built, to connect with the section northwest of Oyster River to near Hardy Bay, the route map for which was recently approved. (May, pg. 238.)

Fredericton and Grand Lake Coal and Ry. Co.—We are officially advised that a contract has been let to A. E. Trites, Moncton, N.B., for the construction of the line from Gibson to a connection with the New Brunswick Coal and Ry. Co.'s line at Minto, N.B., 31 miles. The company will supply the ties and bridges, the rails and fastenings, the contractor doing all other work. The track will be laid with 73 lb. steel relaying rails supplied by the C.P.R.

The contract for the steel bridges has been let to the Dominion Bridge Co. as follows:—Nashwaak River, four 80 ft. half deck girder spans; Noonan Creek, one 40 ft. half deck girder span; Burpee Mill stream, one 80 ft. half deck girder span; Little River, two 80 ft. half deck girder spans.

Press reports state that subcontracts have been let for construction as follows:—G. McPhail, Woodstock, N.B., three miles; J. C. Kitchen, Fredericton, N.B., five miles; D. C. Burpee and Son, Gibson, N.B., concrete and mason work.

The plans and book of reference showing the lands to be taken for the construction of this railway from Gibson on the Intercolonial Ry., and a connection with the New Brunswick Coal and Ry. Co.'s line west of Minto, have been deposited with the Commissioner of Public Works at Fredericton, and with the clerks of the peace for the counties of York and Sunbury.

The New Brunswick Legislature amended the charter of the company in certain particulars, details of which have already been given. Sir Thos. Tait is President and H. W. D. Armstrong Chief Engineer. (Mar., pg. 238.)

Gatineau and Ungava Ry.—The Dominion Parliament has changed the name of the company to the Ottawa and Ungava Ry., and extended the time within which the lines authorized to be built by chap. 102, statutes of 1910, may be built. (Dec., 1911, pg. 1137.)

Glengarry and Stormont Ry.—The Ontario Legislature has incorporated a company with this title, C. L. Hervey, A. A. Mellor, Montreal, and T. Burgess, Ottawa, as provisional directors, to build a railway from the C.P.R., on the eastern boundary of the province in Lancaster tp., to the St. Lawrence River, in Charlottenburg tp., and thence to Cornwall, and branch lines. (Mar., pg. 120.)

Grand Lake and Bell River Ry.—A subsidy has been voted by the Dominion Parliament in aid of the building of a railway from Bell River on the National Transcontinental Ry., along the Bell River to Twenty-one Mile Bay on Grand Lake, or to Rabbit Lake on the Ottawa River, not to exceed 45 miles.

The Quebec Legislature has voted 2,000 acres of land a mile in aid of the projected line, from the National Transcontinental Ry. to Twenty-one Mile Bay.

Great Northern Mining and Ry. Co.—A subsidy has been voted by the Dominion Parliament in aid of building a line from Little River, through Belle Marche, to Eastern Harbor, Cape Breton Island, N.S. (July, 1911, pg. 645.)

The Guelph Patent Cask Co has been authorized by the Quebec Legislature to build and operate a railway and branches.

Halifax and Eastern Ry.—The Provincial Engineer of Nova Scotia in his annual report for the year ended Sept., 1911, states that early in the year the plans for a large portion of the proposed line from near Halifax to Guysboro, and Country Harbor, etc., were submitted to the company and preparations were made for early construction. The company entered into negotiations with the Dominion Government, with the result that the work was taken over by the Federal authorities, thus relieving the province of all responsibility in connection with this important work. (Jan., pg. 21.)

Howe Sound and Northern Ry—Tenders are being asked for construction from the end of the present line to mileage 12, from mileage 12 to 24.1, and for a branch line from mileage 2.3 on the present line, for 2.7 miles along the Squamish River Valley. Cleveland and Cameron, Vancouver, B.C., are engineers.

The existing line starts from near Newport, on Howe Sound, B.C., and extends to the Cheakamus River, about 11 miles. The extension of the main line will carry it to near the Green Lake summit, and the work will be fairly heavy. The spur line will give access to the water front on the east side of Howe Sound. The line is used for the purpose of providing shipping facilities for logs, and has power to carry on a general business, for which special rolling stock has been added. (June, 1911, pg. 505. See also Pacific Great Eastern Ry.)

Hudson Bay and Pacific Ry—An application has been made in the courts in London, Eng., for the compulsory winding up of the company. The matter was allowed to stand over, as counsel for the company stated that arrangements were being made for raising money for construction and other purposes, when the petitioners would be paid off. (May, pg. 238.)

Intercolonial Ry.—We are officially advised that Cavicchi and Pagano have sublet the work on the line from Dartmouth to Deans Settlement as follows:—Mile 1 to 12, D. Washburn, Woodside, Dartmouth, N.S.; mile 12 to 27, G. S. Whitehead Construction Co., Lawrencetown, Halifax County, N.S.; mile 34 to 36, W. Waddell, Musquodoboit Harbor, N.S.; mile 36 to 45, Garrett and Campbell, Musquodoboit Harbor, N.S.; mile 45 to 55, McDonald and MacIntosh, Little River, N.S.; mile 55 to 62, Chisholm and McGillivray, Middle Musquodoboit, N.S.; mile 62 to 68, Bellman, Gillis and Co., Deans Settlement, N.S.

Tenders are under consideration for the building of a brick and stone passenger station at Chatham, N.B., and for a standard wooden passenger station and dwelling at Nelson, N.B.

We are officially advised that the route for the proposed cut-off from the new shops at Moncton, N.B., to Sunnybrae, has not yet been finally located, nor the plans decided upon. (May, pg. 238.)

Iron Range Ry—The Ontario Legislature has extended the time within which the company may build the line authorized by chap. 127, statutes 1907. (Feb., pg. 68.)

Kettle Valley Lines.—The route plan from Penticton to Osprey Lake summit has been approved by the Minister of Railways, while the application for the approval of the route plan from Vernon to Kelowna, B.C., was held over to enable the company and the Canadian Northern Pacific Ry. to come to terms. The Board of Railway Commissioners has approved location plans between mileage 53.92 and 65, west of Midway.

Press reports state that contracts have been let C. H. Williams and Co., six miles; Milligan, Dussault and Co., nine miles, and Porter and Connelly, ten miles, west of Carmi, B.C. This mileage, it is said, will take the line to within 15 miles of the summit. Another report states that G. A. Carlson and Co., Spokane, Wash., have been given a contract for building of 35 miles from above Trout Creek, to Osprey Lake, the work to be completed during 1913. (May, pg. 239.)

Kingston and Pembroke Ry.—It is proposed to expend about $200,000 upon betterments this year, the principal expenditure being for the relaying of the line from Renfrew, Ont., for 80 miles towards Kingston with new steel rails, 65 lbs., C.P.R. standard section. A considerable quantity of ballast. will be added, and a turntable is to be put in at Kingston. (Oct., 1911, pg. 937.)

Kootenay and Alberta Ry.—We are officially advised that the company does not contemplate any further construction this year, beyond the completion of the line started in 1910. This line starts from the C.P.R. Crow's Nest Pass line about a mile west of Pinetree station, and extends southwesterly for about 13 miles to Beaver Creek, the site of the Western Coal and Coke Co.'s mines. Owing to the wet season of 1910, the construction was not completed as was expected. (May, pg. 239.)

Lac Seul, Rat Portage and Keewatin Ry.—The Ontario Legislature has extended the time within which the company may build the lines authorized by chap. 102, statutes 1903. (Mar., pg. 121.)

L'Avenir and Melbourne Ry.—A subsidy has been voted by the Dominion Parliament for building a line from Melbourne to Drummondville, Que., 28 miles, in lieu of the subsidy voted in 1910. (April, 1911, pg. 321.)

Lindsay and Minden Ry.—The Ontario Legislature has incorporated a company with this title to build a railway from Lindsay to Mountain Lake, in Minden tp., with branch lines, and to develop and distribute electric power. The provisional directors are:—J. H. Delamere, M. Brown, J. J. Mortimer, Minden, Ont.; J. W. Wood, Lindsay, Ont.; S. F. Stinson, J. M. Delamere, Toronto. (April, pg. 182.)

Little Nation River Ry.—A land grant of 3,000 acres a mile has been voted by the Quebec Legislature for the projected railway from between Thurso and Montebello to Lake Mininingue, about 30 miles. (Feb., 1911, pg. 155.)

Liverpool to Caledonia, N.S.—The Dominion Parliament has voted a subsidy for the building of a line, not exceeding 30 miles, from Liverpool, via Milton, to Caledonia, N.S. This is a re-vote of a subsidy first granted in 1907. It is available for any company building such a line.

London and Port Stanley Ry.—A representative of a British firm has laid a

proposition for the lease or purchase of the line before the London city council. A proposal from the Lake Erie Coal Coal Co. for the electrification of the line is also under consideration. Press reports state also that G.T.R. officials have been looking over the line with a view to leasing it, but this is denied by the superintendent of the division. (May, pg. 239.)

Maine Central Rd.—By an act passed by last session of the New Brunswick Legislature, the company was given incorporation, with an office in St. Stephen, N.B., and formally vested with the ownership of the line from St. Stephen to Sprague's Mills. This piece of line was built as the Lewy's Island Rd., under an act passed in 1855. The title of the company was changed in 1880 to that of the St. Croix and Penobscot Ry., on the sale of the line and franchises under mortgage it passed under the control of the Washington County Ry., a company organized in the State of Maine, which was subsequently purchased by the M.C. Rd. The line has been operated during recent years as the Washington County branch.

Medicine Hat, Alta.—A bylaw has been passed by the taxpayers of Medicine Hat, Alta., authorizing the construction of a line of three miles, within the city limits, to connect with a three mile line without the city limits, to the Ansley coal mine. The latter section is to be built by the colliery company, and the first section will be controlled by the city. Construction will be started immediately. It is intended to run spur tracks off the line for industrial purposes. (See Ansley Coal Co., April, pg. 181.)

Metabetchouan Ry.—The Quebec Legislature has granted 1,000 acres of land a mile for a line from Lac Bouchette to St. Andre, on the River Metabetchouan, Que.

Michigan Central Rd.—The contract for the erection of the company's new station and terminals at Detroit, Mich., has been let to the George A. Fuller Co. The railway company will do the excavation, put in the foundations, and other preparatory work. It is estimated that there will be 10,000 tons of steel in the new station and train shed; that the station building will cost about $2,500,000, and the total outlay on the terminals will be about $6,000,000. (April, pg. 182.)

Midland Continental Ry.—Press reports state that plans have been prepared for a line from Edgeley, N.D., via Franklin, Nortonville and Millerton, to Jamesville, thence to Pembina, at the international boundary, 230 miles. Some grading has been done, and it is reported that contracts will be let at an early date for the completion of the line. F. K. Bull, Racine, Wis., is president, and H. H. Hurning, Edgeley, N.D., is engineer. (Mar., pg. 121. See Winnipeg, Salina and Gulf Ry.)

Midland Terminal Ry.—The Ontario Legislature has extended the time for the building of the line authorized by chap. 105 of the statutes of 1903, and has authorized the building of a line from Midland Harbor southeasterly to the G.T.R., near Coldwater, Ont. (April, pg. 182.)

Minneapolis, St. Paul and Sault Ste. Marie Ry.—Press reports state that a line is being built from Fordville, N.D., westerly via Devil's Lake to Drake, 130 miles, the contractors being Foley, Welch and Stewart. (Mar., pg. 121.)

Miramichi Valley Ry.—The New Brunswick Legislature has incorporated a company with this title to build a railway from Newcastle, or from a junction with the Intercolonial Ry., near Newcastle, along the valley of the Miramichi River to Tracadie. The company is authorized to operate vessels, and to build docks, wharves and warehouses as a part of its undertaking. The provisional directors are:—Jas. Robinson, E. A. McCurdy, D. Morrison, W. L. Allan, W. A. Park, E. H. Sinclair, Hon. A. Ritchie.

Montreal and Lake Victoria Ry.—The Dominion Parliament has incorporated a company with this title to build a railway from Montreal to the National Transcontinental Ry at Grand Lake Victoria, Que., and thence to Migiskan River, and on to Hannah Bay, on James Bay, Ont. The railway committee directed that the title of the company as applied for be abandoned, and that the present one be adopted. (See Montreal Transcontinental Ry., April, pg. 182.)

Montreal and Northern Colonization Ry.—The Quebec Legislature has extended the time for the building of the lines mentioned in our Mar. issue. (Mar., pg. 121.)

Montreal to National Transcontinental Railway.—It is reported that F. H. Clergue, Sault Ste. Marie, Ont., is negotiating with the Dominion Government, with the view of obtaining a contract to build a line from Montreal to the National Transcontinental Ry. and thence to the mouth of the Nottoway River on James Bay, for which a subsidy was voted last session. A land subsidy in aid of such a railway has been voted by the Quebec Legislature.

F. H. Clergue is quoted as stating that the first vessel of the Hudson Bay Navigation Co. will sail from Montreal, July 1, for the mouth of the Nottawa River, carrying a party of engineers, explorers, etc. It is proposed to make a thorough examination of the valley of the river, and to make surveys in connection with a projected railway.

While this line is mentioned as being the one in which Mr. Clergue is interested, there is a possibility that he may be looking after the location of a terminal on Hudson Bay for the Algoma Central and Hudson Bay Ry., which has power to extend the line now building to the National Transcontinental Ry. to Hudson Bay. (May, pg. 239.)

Montreal Tunnel Co.—A delegation representing municipalities on the south shore of the St. Lawrence River contiguous to Montreal, waited on the Dominion Government, May 2, to ask that the company's bonds be guaranteed for $15,000,000 at 4½% for 50 years. The company proposes to bore a tunnel from St. Lambert and Longueuil, under the St. Lawrence River to Montreal, following the line of St. Denis St. to Cote St. Michel. It is proposed to provide accommodation in the tunnel for steam railways and for high speed electric lines. Terminals are to be provided. with a passenger station at the Champ de Mars. Consideration of the application was promised.

Naas and Skeena River Ry.—The Dominion Parliament has voted a subsidy for a line from Nasoga Gulf, or other point on Portland Inlet or Naas River, towards the anthracite coal deposits on the Skeena River, near Groundhog Mountain, B.C., not to exceed 100 miles. (Dec., 1911, pg. 1139.)

Nerepis and Long Island Ry.—The New Brunswick Legislature has incorporated a company with this title to build a line from Welsford on the C.P.R. to the proposed St. John River Valley Ry., between Gagetown and Hampstead, a spur line from near Petersville to the Clones district, and other branch lines. The provisional directors are:—H. M. Woods, J. M. Queen, J. B. M. Baxter, F. C. Taylor, A. R. Slipp. (Apr., pg. 182.)

New Brunswick Coal and Ry. Co.—Traffic on this line was resumed May 13, a temporary pile structure having been put in to replace the span of the Washademoak bridge which was washed out April 10. Owing to the present high water it will not be possible to put in a permanent span until later in the year. (Sept., 1911, pg. 835.)

Northern Vancouver Island Ry.—Press reports state that T. A. Kelly is making a reconnaissance survey from Rupert Arm on Quatsino Bay, and that a second party is working to meet him from Fort McNeil and Hardy Bay, on Vancouver Island. The survey parties are expected to be in the field for about four months. (Apr., 1911, pg. 321.)

North Shore Ry. and Navigation Co.—The New Brunswick Legislature has incorporated a company with this title to build a railway from near Adamsville, on the Intercolonial Ry., to a connection with the National Transcontinental Ry. near Snowshoe Lake, and from Beersville to Richibucto Head, with a branch line from Harcourt to the Salmon River, and other branch lines. It is also authorized to acquire the North Shore Ry., originally the Beersville Coal and Ry. Co., extending from Adamsville to Beersville, with the branch from Beersville to Mount Carlyle, and operate it in connection with its authorized line as one railway. The provisional directors are:—G. W. Fowler, Sussex, N.B.; M. F. Keith, Moncton, N.B.; A. B. Carson, Rexton, N.B.; H. J. Von Hazen, E. E. Smith, New York City; J. H. Wood, W. A. P. Davis, Philadelphia, Pa. H. J. Von Hazen is one of the principal owners of the present North Shore Ry. (See North Shore Ry., April, pg. 182.)

Northeastern Ry.—The Quebec Legislature has extended the time within which this projected railway may be built, and authorized a change in its title to the North Ry. (Jan., pg. 22.)

Pacific Great Eastern Ry.—P. Welch, Vice President, is quoted as stating that several survey parties are in the field, and that it is expected that the reports will be prepared so that construction can be started at both ends of the line at an early date. Some preliminary construction work is being done at Fort George, the point of junction with the G.T. Pacific Ry. The company has power to take over the Howe Sound and Northern Ry. line, and while negotiations with that object in view have taken place, nothing definite appears to have been settled. Press reports state that there is a difference of $10,000 between the price offered by the P.G.E. Ry. and the amount which the H.S. and N. Ry. asks. (May, pg. 239.)

Pacific and Hudson Bay Ry.—The Minister of Railways has approved the route plan of this projected railway from Kimsquit to Netal-Kus Lake, B.C. (July, 1911, pg. 647.)

Prince Edward and Hastings County Ry.—The Dominion Parliament has incorporated a company with this title for the purpose named in our April issue. (April, pg. 182.)

Quebec Central Ry.—The Dominion Parliament has voted subsidies for a line from mileage 30 out of St. George to St. Sabine, and thence to Sionne tp., Que., not to exceed in all 51.34 miles.

A subsidy of 3,000 acres of land a mile has been voted by the Quebec Legislature to the Q.C.R. Co. to extend the line from St. George to the boundary line between Dorchester and Bellechasse, 1.50 mile; and of 2,000 a mile to "a company" to extend the Quebec Central Ry. from the Dorchester-Bellechasse boundary, easterly for 20 miles. (Jan., pg. 23.)

Quebec Eastern Ry.—We are officially advised that surveys are being made for the proposed line between Sherbrooke and Quebec, and that it depends entirely upon the completion of these surveys when construction will be started. (April. pg. 182.)

Queen's Central Ry.—The Nova Scotia Legislature has extended the time within which the company may build the line authorized by chap. 166, statutes of

1910. The company has power to build a line from Brooklyn via Milton, to a junction with the Halifax and Southwestern Ry., between Pleasant River and Caledonia. (Sept., 1910, pg. 729.)

Queen's County Ry.—The Nova Scotia Legislature has extended the time within which the railway, authorized to be built by chap. 174, statutes of 1909, may be built. The company was authorized to acquire the line from Wilkin's Siding on the Halifax and Southwestern Ry., built by the Sable Lumber Co., and to extend it as may be required. (Nov., 1909, pg. 831.)

Quinze River and Ottawa Ry.—The Dominion Parliament has incorporated a company with this title to build a railway from Kipawa northwesterly to the Quinze River. Que., with power to make connection at Kipawa with the C.P.R. (Mar., pg. 121.)

Richmond, Magog and Stanstead Ry—The Quebec Legislature has granted 2,000 acres of land a mile for a line from Richmond to Stanstead, about 50 miles, with a branch from Cherry River to Waterloo, 20 miles. (May, 1911, pg. 413.)

Richmond-Melbourne-Drummondville.—The Quebec Legislature has granted 2,000 acres of land a mile for a railway from Richmond or Melbourne to Drummondville, Jue.

Rosevale to Moncton, N.B.—A subsidy has been voted by the Dominion Parliament for a railway from Rosevale, Albert County, to Stoney Creek, and thence to Moncton, 22 miles.

St. Agathe des Monts to Howard.—The Dominion Parliament has voted a subsidy for the building of a line from St. Agathe des Monts station, on the C.P.R. Northern Colonization Ry., to Howard tp., Argentine county, 15 miles.

St. Croix Docks and Ry. Co.—The New Brunswick Legislature has incorporated a company with this title to build a line from St. Stephen to Oak Bay, or below the Ledge, on the St. Croix River, and to construct terminals, docks, wharves, etc., there. The provisional directors are:—G. A. Grimmer, D. F. Maxwell, W. H. Berry, F. P. McColl, F. M. Murchie, G. J. Clarke.

St. John and Quebec Ry.—A press dispatch states that an issue of $4,500,000 of 4% debentures, guaranteed by the province of New Brunswick, has been placed on the London market at 98½.

We are officially advised that contracts for grading, tracklaying and ballasting, have been let as follows: Fredericton to Woodstock, 62 miles, Quebec Contracting Co., Montreal; Woodstock to Centreville, 23 miles, Kennedy and McDonald, Antigonish, N.S. The contracts for the line from Fredericton southerly were under consideration when we were advised, and press reports state that a contract for this work has been let to James S. Corbett and Sons, Ltd. Ross Thompson, Fredericton, is Chief Engineer. April, pg. 182.)

St. Leonards to Dudswell.—The Quebec Legislature has granted 2,000 acres of land a mile for a line from St. Leonards, on the Intercolonial Ry., to the junction of the Quebec Central Ry. and the Maine Central Ry., in Dudswell tp., Que.

Saskatchewan Central Ry.—The Dominion Parliament has extended the time within which the company may build the line authorized by chap. 160 statutes of 1910. (Dec., 1911, pg. 1141.)

Saskatoon and Hudson Bay Ry.—Press reports state that a committee has been appointed to look after the company's interest in the West, with a view to enabling organization to be completed by the fall. The provisional directors are—F. O. Fowler, Winnipeg; V. T. Bartram, Toronto; C. O. Foss, St. John, N.B.; H. Pardee, Philadelphia; J. B. Craven, New York city. (July, 1911, pg. 649.)

Saskatoon Transfer Ry.—The plans of this projected railway show lines connecting the C.P.R. with the G.T. Pacific Ry., and the Canadian Northern Ry., and passing through what is being developed as a manufacturing district in West Saskatoon. Two industries are starting up in the district in June, and negotiations are in progress which it is hoped will result in the erection of additional factories in the near future. The factory district will extend the whole way between the lines of the three railways named, and in width from Caledonian to Wabash Avenue, and a site reserved for union stock yards will also be served. The plans of the line have been prepared by T. W. Brown, C.E., and we are advised that it is hoped to complete the organization of the company and to start construction by July. The provisional directors named in the Saskatchewan act incorporating this company are:—C. I. Alexander, L. N. Le Valley, J. G. Hill, Saskatoon, Sask. (April, pg. 182.)

Simcoe, Grey and Bruce Ry.—A subsidy has been voted by the Dominion Parliament for 50 miles of the projected railway between Kincardine and Orillia, Ont.. this mileage to include the portion of the line between Owen Sound and Meaford, Ont. (July, 1911, pg. 649.)

Southampton Ry.—Contracts have been let, according to press reports, to Wm. McDonald and Sons, and to McDonald Bros., for the completion of the line from Millville south and southwest to Hawkshaw Bridge, on the St. John River, N.B., 13 miles. G. A. Brown, Millville, N.B., is engineer. The Dominion Parliament has voted a subsidy for a line from Millville, on the C.P.R., to Pokrok Bridge, on the St. John River, N.B., not to exceed 13 miles.

Sussex, Studholme and Havelock Ry.—The New Brunswick Legislature has incorporated a company with this title to build a railway from Havelock to a junction with the Intercolonial Ry. in Sussex parish, King's County. The provisional directors are:—S. A. McLeod, G. B. Jones, J. E. McAuley.

Sydney and Louisburg Ry.—The Nova Scotia Legislature has granted, among other powers, an extension of time for building branch lines. (Oct., 1911, pg. 937.)

Temiskaming and Northern Ontario Ry.—An act has been passed by the Ontario Legislature repealing sec. 5, chap. 18, statutes of 1907, and substituting therefor a section providing that the location of the line and of all branches, the plans of all works proposed, and the bylaws of the corporation, shall be subject to the approval of the Lieutenant-Governor-in-Council. A new section provides that the Commission may make regulations fixing the fares and tolls to be charged, which are to be approved by the Lieutenant-Governor-in-Council before they become operative, and confirming the regulations fixing fares and tolls already made. The act also confirms the agreements made with the G.T.R. and the Canadian Express Co. A summary of the first of these agreements, as confirmed by the Dominion Parliament, was given on pg. 235 of our last issue. (May, pg. 240.)

Toronto, Hamilton and Buffalo Ry.—Engineers are engaged in making surveys of the line in the city, and of the streets in its vicinity, and the city authorities state that they expect shortly to receive a proposition from the company, regarding improvements, which would include the lowering of the streets at the railway crossings. (April, pg. 183.)

Toronto, Lindsay and Pembroke Ry.—The Dominion Parliament has voted a subsidy for a line from Golden Lake to Bancroft, Ont., not exceeding 51 miles. This is a revote of the subsidy of 1910.

United Goldfields of British Columbia.—The Dominion Parliament has authorized the company to build its projected railway from Frank, Alta., through ranges three or four to Grassy Mountain.

Vancouver Island and Eastern Ry.—The Dominion Parliament has extended the time within which the company may build its projected railway and bridges from Vancouver Island across Seymour Inlet to the mainland, and thence easterly. (Dec., 1911, pg. 1141.)

Western Dominion Ry.—The Dominion Parliament has incorporated a company with this title to build a railway from near Cardston, Alta., via Pincher Creek, to the C.P.R. Crows Nest Pass branch at Lundbreck, thence northerly to Calgary and Edmonton, Alta., and Fort St. John, B.C., with a branch from Pincher Creek to the Old Man River. The provisional directors are:—J. E. Askwith, J. O. Carss, W. R. Askwith, O. E. Culbert, Ottawa; H. McI. McCallum, Regina, Sask.

Press reports state that U.S. capital is being invested in this projected railway, which is said to be a revival of the Alberta Pacific Ry. proposal. Arrangements are said to be nearly completed for surveys from Pincher Creek to Calgary, Alta. H. M. Goodman is reported to be in charge.

A meeting of the shareholders was called to be held in Ottawa, May 21, for organization purposes. This company has power to take over the Alberta Pacific Ry. charter. (See Alberta Pacific Ry., May, pg. 238.)

Winnipeg North Eastern Ry—The Manitoba Legislature has given the company power to amalagamate with other companies, and has otherwise amended the act of incorporation passed in 1911. The amendments do not affect the company's power to build railways. (Mar.. pg. 122.)

Winnipeg River Ry.—The Manitoba Legislature has granted the company power to amalgamate with other companies, and has amended its charter in several particulars. Its power to build railways is not affected by the amendments. (Mar., pg. 122.)

Winnipegosis and Northern Ry.—The Manitoba Legislature has incorporated a company with this title to build a railway from the Porcupine Mountains district, near Steep Rock River, to Dawson Bay, on the west shore of Lake Winnipegosis, and crossing the Canadian Northern Ry. near Mafeking station. The provisional directors are:—B. A. C. Craig, P. A. McEvoy, W. J. Rooney, G. F. Morrison, Toronto. (April, pg. 183.)

Winnipeg, Salina and Gulf Ry.—Press reports state that negotiations are in progress for the sale of $13,000,000 of the company's bonds in Paris, France, and that construction will be started as soon as the funds are available. Surveys are reported to be completed on about 200 miles of the line in the U.S., and a general contract for construction let to the Brindley Co., New York. H. L. Miller is president, and H. G. Wylie, Salina, Kan., is engineer. (Feb., pg. 68. See also Midland Continental Ry.)

Yukon Railway Extension.—A. Thompson, M.P. for the Yukon district, in an interview at Vancouver, B.C., May 1. said he hoped that the Dominion Government would send out an expedition to make a reconnaissance survey of a route for a railway from the Lynn canal into the interior. The people resident in the territory hoped that in time there would be a railway traversing the Yukon plateau from end to end and connecting with the line proposed to be built by the U.S. Government through Alaska, from Seward to the Yukon River.

Railway and Allied Associations, Clubs, Etc.

The names of persons given below are those of the secretaries.

CANADIAN CAR SERVICE BUREAU, J. E. Duval, 401 St. Nicholas Building, Montreal.

CANADIAN FREIGHT ASSOCIATION, T. Marshall, Canadian Express Bldg., Montreal.

CANADIAN FREIGHT ASSOCIATION, (Western Lines), W. E. Campbell, 502 Canada Building, Winnipeg.

CANADIAN RAILWAY CLUB, J. Powell, St. Lambert, Que. Meetings at Montreal 2nd Tuesday each month, 8.30 p.m., except June, July and August.

CANADIAN SOCIETY OF CIVIL ENGINEERS, C. H. McLeod, 413 Dorchester St., west, Montreal.

CANADIAN STREET RAILWAY ASSOCIATION, Acton Burrows, 70 Bond Street, Toronto.

CANADIAN TICKET AGENTS' ASSOCIATION, E. de la Hooke, London, Ont.

CENTRAL RAILWAY AND ENGINEERING Club of Canada, C. L. Worth, 409 Union Station, Toronto. Meetings at Toronto 3rd Tuesday each month, except June, July and August.

EASTERN CANADIAN PASSENGER Association, G. H. Webster, 54 Beaver Hall Hill, Montreal.

ENGINEERS' CLUB OF MONTREAL, R. W. H. Smith, 9 Beaver Hall Square, Montreal

ENGINEERS' CLUB OF TORONTO, R. B. Wolsey, 94 King St. west, Toronto.

NOVA SCOTIA SOCIETY OF ENGINEERS, A. R. McCleave, Halifax, N.S.

QUEBEC TRANSPORTATION CLUB, J. S. Blanchet, Quebec.

WESTERN CANADA RAILWAY CLUB, W. H. Rosevear, 25½ Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month except June, July and August.

Transportation Conventions in 1912.

June 4.—Association of Railway Telegraph Superintendents, New York City.

June 5.—American Association of General Baggage Agents, New York City.

June 11-13.—International Association of Railway Special Agents and Police. Buffalo, N.Y.

June 12-14.—Master Car Builders' Association, Atlantic City, N.J.

June 16-18.—Wood Preservers' Association, Chicago, Ill.

June 17-19.—American Railway Master Mechanics' Association, Atlantic City, N.J.

June 18.—Train Dispatchers' Association of America, Louisville, Ky.

June 18-21.—American Association of Freight Agents, Detroit, Mich.

June 19.—Freight Claim Association, Buffalo, N.Y.

June 25-26.—Association of Transportation and Car Accounting Officers, Bluff Point, N.Y.

June 26.—Association of American Railway Accounting Officers, Quebec, Que.

July 9.—American Railway Tool Foremen's Association, Chicago, Ill.

July 23-26.—International Railway General Foremen's Association, Chicago, Ill.

Aug. 15.—International Railroad Master Blacksmiths' Association, Chicago, Ill.

Aug.—Travelling Engineers' Association.

Sept. 9.—International Association of Ticket Agents, Muskoka, Ont.

Sept. 10-12.—Roadmasters' and Maintenance of Way Association, Buffalo, N.Y.

Sept. 10-13.—Master Car and Locomotive Painters' Association of United States and Canada. Denver, Col.

Oct.—American Railway Bridge and Building Association, Baltimore. Md.

Oct. 7-11.—Association of Transportation and Car Accounting Officers, Chicago, Ill.

Oct. 7-11.—American Electric Railway Association, Chicago, Ill.

Oct. 8-9.—Canadian Ticket Agents' Association, Ottawa, Ont.

Oct. 15-17.—American Railway Bridge and Building Association, Baltimore, Md.

Oct. 17-19.—American Association of Dining Car Superintendents, Denver, Col.

Oct. 23-25.—Society of Railway Financial Officers, Atlantic City, N.J.

Nov. 6-10.—Association of Railway Electrical Engineers, Chicago, Ill.

Nov. 15.—American Railway Association, Chicago, Ill.

Nov. 15-16.—American Association of Freight Traffic Officers, Chicago, Ill.

Nov. 19-21.—Maintenance of Way Master Painters' Association, Chicago, Ill.

Dec. 12-13.—Association of Transportation and Car Accounting Officers, Louisville, Ky.

Among the Express Companies.

G. L. Misener has been appointed agent, Canadian Ex. Co., at Galt, Ont., vice W. H. Montgomery.

J. W. Herbert has been appointed agent, Canadian Northern Ex. Co., at Regina, Sask., vice W. A. Best, appointed cashier.

The Board of Railway Commissioners has defined the express delivery and collection limits of Sydney, N.S., Toronto, Ont., and Kelowna, B.C.

The Canadian Northern Ex. Co. has opened offiecs at St. Norbert, Man.; Ceylon, Marcelin and Wroxton, Sask., and has closed its office at Vandura, Sask.

The Board of Railway Commissioners has issued order 16399, dated Apr. 27, ordering express companies to prepare tariffs, or supplement to Express Classification, showing scale of charges for the return of the proceeds of c.o.d's, upon other than merchandise rate basis, and to file same within three months.

The Dominion Ex. Co. announces that on the opening of navigation on the Muskoka Lakes, it has established waybill offices at Beaumaris, Minett, Port Carling, Port Cockburn, Port Sandfield, Rosseau, Royal Muskoka and Windermere. Shipments to other than regular ports of call on the lakes are accepted at tariff rates to Bala, with the addition of the following rates: For seven pounds or under, 15c.; 7 to 20 lbs., 20c.; 20 to 80 lbs., 25c.; 70 to 100 lbs., 35c.; over 100 lbs., 35c. per 100 lbs. All charges must be prepaid and shipments waybilled to Bala only. Shipments will not be handled on the vessels on Sundays, and money and valuables will not be handled on the lakes. They will be waybilled to Bala and the consignee notified.

Canadian Express Company's Staff.

The superintendents' divisions and route agents territory have been revised as follows:—

SUPERINTENDENTS.

E. ALLEN, Western Division, including Northern and Midland Divisions, except the portion of the division between Belleville and Peterboro and between Whitby and Manilla Jct. Route Agents, agents, and other employes in this territory will report all routine matter to him. Office, Toronto.

H. C. CREIGHTON, Atlantic Division, has charge of all details on Intercolonial Ry. east of Riviere du Loup, and all lines operated by the company in the Maritime Provinces. Office, St. John, N.B.

P. A. PATERSON, Central and Eastern Divisions, including the portions of Midland Division between Belleville and Peterboro and between Whitby and Manilla Jct., Ont. Office, Montreal.

N. J. ROSS, North Western Division, including main line of the Grand Trunk Pacific Ry. and branches, from Port Arthur, Ont., to Hinton, Alta. Office, Winnipeg, Man.

ROUTE AGENTS.

W. G. BALFOUR, Montreal, routes 3, River Beaudette to Kingston, inclusive; 4, Kingston to Port Union, inclusive. 18, 21, 25, 80, 81, 82, 83 and 109 reporting to Supt. Paterson.

G. W. HICKEY, Hamilton, Ont., 12, 16, 26, 27, east of and including Eastwood, 29, 30, east of and including Simcoe; 31, not including Toronto; 38, south of and including Hespeler; 42, not including Stratford; 47, 106 and 108 reporting to Supt. Allen.

R. H. JONES, Toronto, Ont., 5, not including Toronto and Parkdale; 13, 36, not including Galt; 38, north of and including Guelph Jct.; 39, 40, 41, north of and including Clinton Jct.; 43, 45, 126 reporting to Supt. Allen.

H. N. LINGLEY, Truro, N.S., 57, Amherst to Halifax, both inclusive; 60, 61, 62, 63, 64, 66, 91, 98, 100, 101, 102, 111, 116, 117, 118, 119, 123 reporting to Supt. Creighton.

B. S. MURRAY, London, Ont., 6, not including Stratford; 14, 15, 17, 27, east of and including Nixon; 35, 37, 41, south of and including Brucefield; 103, 124 and 126 reporting to Supt. Allen.

R. H. MCINNES, Montreal, 1, 2, St. Lambert to Island Pond inclusive; 7, 8, 11, 52, St. Lambert to Levis inclusive; 53, 54, 89 and 110 reporting to Supt. Paterson.

G. H. H. NASE, St. John, N.B., 55, 56, 57, Moncton to Aulac inclusive; 58, 59, 65, 90, 92, 93, 94, 95 and 122 reporting to Supt. Creighton.

W. E. NORMAN, Toronto, Ont., 4, west of and including Scarboro; 5, Parkdale only; 18, Lakefield only; 19, not including Port Hope; 20, 22, 23, Woodville to Blackwater Jct.; 32, 33, south of and including Orillia; 48, north of and including Cheltenham; 49, 50, 51 reporting to Supt. Allen.

H. C. M. PORRITT, North Bay, Ont., 23, Lorneville Jct. to Midland, but not including Orillia; 24, 34, 99, 129, 72, Scotia Jct. to Depot Harbor; 130, 131, 132, reporting to Supt. Allen.

A. J. SEATON, Montreal, Que., 2, Montreal to Point St. Charles inclusive; 3, Montreal to Coteau inclusive. 9, 10, 67, 68, 69, 70, 71, 72, Madawaska to Kearney inclusive; 73, 84, 112, 113 and 114 reporting to Supt. Paterson.

F. M. SMITH, Winnipeg, Man., all routes on Grand Trunk Pacific from Port Arthur, Ont., to Hinton, Alta., inclusive, reporting to Supt. Ross.

Telegraph and Cable Matters.

The Great North Western Telegraph Co. has opened an office at Chaudiere Basin, Que., and has closed its offices at Ahmic Harbor, McKellar and Magnetawan, Ont., and Tracadie, N.B.

C. E. McManus, who has been circuit manager, Great North Western Telegraph Co., Toronto, for several years, has retired on a pension, on account of ill health. He was recently presented with a purse of gold by his associates.

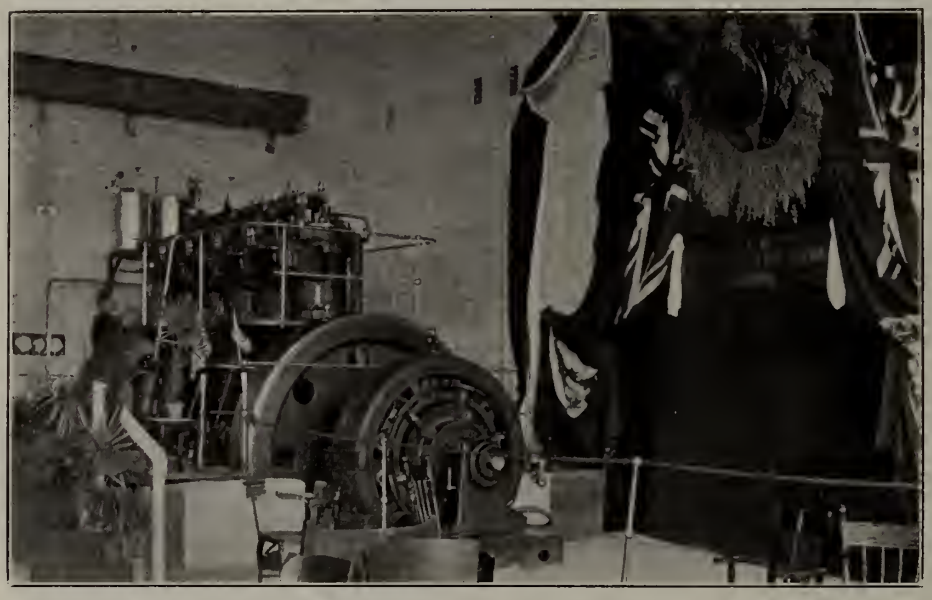
L. A. Hutton, whose appointment as Inspector of Telegraphs, District 1, Alberta Division, C.P.R., Medicine Hat, was announced in our last issue, was born at Winnipeg, Mar. 1, 1883, and entered C.P.R. service, July 26, 1909, as telephone inspector, at Medicine Hat, Alta. He installed the first telephone train dispatching circuit in Alberta, was transferred to Calgary, Aug. 14, 1911, and retained the same position, to Apr. 1, 1912, the date of his present appointment.

Electric Railway Department

The Moose Jaw Electric Ry's Equipment, Plant, Etc.

This company, which is operating at Moose Jaw, Sask., has about eight miles of track, over three miles of which are double tracked. It is expected to build about 2½ miles more. Eight cars are being operated giving a service varying from five minutes on the principal line to ten minutes on the least travelled one.

The cars are single truck, p-a-y-e, manufactured by the Ottawa Car Co.



Mocse Jaw Electric Ry. Power House Equipment.

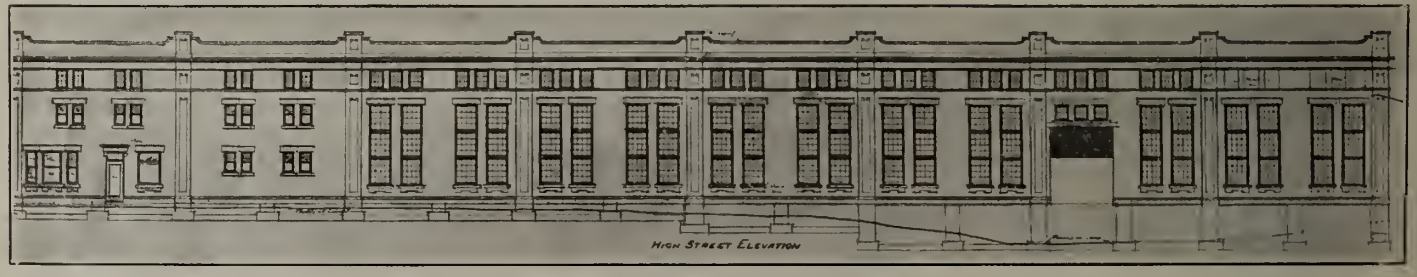
They are equipped with two 40 h.p. Westinghouse motors, hand brakes being used. Single end cars are used throughout with the aid of three way Y's at the ends of the lines for turning.

The power house building, at the corner of Fourth Ave. and High St., 250 x 62 ft., one story high, contains the power generating units, as well as a heating plant, smithy, machine shop, car barn and office. The car barn is modern in every way, being exceptionally high and well lighted. A pit extends throughout the barn underneath tracks. Along one pit a five-ton hydraulic jack is in use for changing wheels and other repair work to cars. One section of rail can be taken out at machine shop doors. A jib crane with trolley can pick up a pair of wheels or motor from pit and transfer to the beam runway in machine shop or transfer to any machine in the shop.. The machine shop equipment consists of one geared lathe; one 24 x 30 back geared lathe; one 16 in. swing, 6 ft. bed, back geared lathe. one 24 x 30 back geared shaper with down feed power, all made by the Canada Corporation manufacture. One 5 lb. 26 in. vertical drilling machine, 2 grinders, fitted with carborrundum wheels, one single stage engine air compressed. This is to be used for cleaning generators, car motors and general purposes. The building is heated with a fan and vento heaters.

The power house part is 125 x 62 ft., and at the present there are two four cylinder crude oil Diesel engines, direct connected to two 125 kw. 550-600 v.d.c. cimpound railway generators. These Deisel engines are supposed to be 204 brake h.p. at sea level, and are operated on crude oil, the normal speed being 250 r.p.m. This Diesel plant was the outcome of a great deal of study and thought as to conditions existing in Saskatchewan, the coal procurable being exceptionally poor, principally lignite, and imported coal is so expensive that it makes a steam proposition almost out of the question. These engines have been operating 18 hours a day since commencing on Sept. 1, 1911, and there has not been an interruption in service of any kind. The manager advises us that he considers their flexibility really remarkable, it being possible for the engineer in charge to have engines in operation and voltage on the board in 30 seconds. The photograph from which the accompanying illustration fig. 1 was made was taken when one unit was installed, and the decorations were put up for inauguration day. An eight ton crane spans the entire width of the building, a 50,000 gallon tank is located at the back of the power house, and with this size of tank it has been unnecessary to go into a cooling tower, as the volume of water is sufficient to procure efficient cooling. It is expected the very near future to have under way the installation of another Diesel engine unit direct connected to generator, this unit being of sufficient size to operate one 275 k.w. railway generator.

The total expenditure on the system up to date is about $350,000, including power house, etc., about $50,000; power house equipment about $45,000; rolling stock about $53,000.

The company officials, etc., are:—President, A. A. Dion, Ottawa, Ont.; Vice President, N. F. Ker, Ottawa; Secretary, D. R. Street, Ottawa; Superintendent, A. Hector Dion, Moose Jaw, Sask.; Accountant, C. E. McGee; Master Mechanic, R. W. Moore; Power House Engineer, G. Connors.



Moose Jaw Electric Ry. Car Barn.

London and Lake Erie Railway Co.'s Car Barns.

The plans for that company's new car barn at St. Thomas, Ont., show a building 208½ ft. deep, by a width of 97¾ ft., to the street and of 89 ft. at the rear. The foundations will be of concrete. The basement section will contain boiler and coal room, and the pits under the car tracks. The foundation walls will be 18 ins. thick, and one wall will extend from front to rear down the middle of the building. The area on one side of this wall will not be excavated, tracks being laid on the level; and on the other wall there will be two pits under the car tracks, one extending the entire length of the building, and the other extending half way. This will give accommodation for four sets of tracks inside the barn. The superstructure will be brick, with large window space, and special roofing.

The accommodation on the car floor, in addition to the storage of cars, will consist of a washroom for cars, 67 by 15 ft.; carpenter's shop, blacksmith's snop, cechanic's room, armature room, stock room, and master mechanic's office, these being contained in an area of 12 by 145 ft.; and on the opposite side of the building, in an area 12 by 54 ft. deep, will be the inspector's office, conductors' room, line department room, and sand and coal room. W. G. Murray, London, Ont., is architect.

Western Canada Power Co.—W. McNeill, Assistant General Manager, informed a meeting of ratepayers in New Westminster, B.C., April 30, that surveys would be made immediately for the New Westminster-Port Moody section of the proposed Vancouver-Mission electric railway. (Mar., pg. 149.)

It is reported that the C.P.R., Canadian Northern Ry., and the G.T. Pacific Ry. are joining with the Saskatchewan Government in a scheme for the utilization of the South Saskatchewan river, for a water supply for cities and towns in the province, and for railway use. T. Aird Murray, M. Can. Soc. C.E., Toronto, is stated to have been engaged as consulting engineer, and it is estimated that the work will cost about $20,000,000.

Electric Railway Finance, Meetings, Etc.

British Columbia Electric Ry.—Gross earnings for March, $491,782; operating expenses, $307,958; net operating earnings, $183,824; renewal funds, $37,935; net earnings, $145,889; approximate income from investments, $25,000; net income, $170,889, against $363,766 gross earnings; $229,658, operating expenses; $134,108, net operating earnings. $29,770, renewal funds; $104,338, net earnings; $20,000 approximate income from investments; $124,338, net income for March, 1911. Aggregate gross earnings for nine months ended Mar. 31, $4,283,459; net earnings, $1,510,420, against $3,072,500, aggregate gross earnings; $1,221,113 net earnings for same period 1910-11.

Calgary Municipal Ry.—Passenger earnings for April, $43,235.45; miscellaneous earnings, $452.05; total earnings, $43,687.50; operating expenses, maintenance, etc., $26,253.33; net earnings, $17,434.17, against $25,631.30 passenger earnings; $730.25, miscellaneous earnings; $26,361.55, total earnings. $12,507.21, operating expenses, maintenance, etc.; $13,854.34, net earnings for April, 1911. Revenue per car mile for April, 31.977c; operating expenses per car mile, 19.216c; surplus per car mile, 12.761c; cost of power per car mile, 4.5c; proportion of expenses to revenue, 60.9%, against 36.983c revenue per car mile; 17.546c operating expenses per car mile; 19.437c surplus per car mile; 6.260c, cost of power per car mile; 67%, proportion of expenses to revenue for April, 1911.

Cape Breton Electric Co.—Gross earnings for March, $24,409.89; expenses and taxes, $15,856.32; net earnings, $8,553.57; interest charges, $4.495.84; balance, $4,057.83; sinking and improvement funds, $1,140. net income, $2,917.73, against $24,198.60, gross earnings; $14752.20, expenses; $9,446.40, net earnings; $4,512.50, interest charges; $4,933.90, balance; $1,141.67, sinking and improvement funds; $3,792.23, net income for March, 1911.

Edmonton Radial Ry.—Receipts for March, $29,966.20; expenditures,. $35,084.61; deficit, $5,118.41.

London St. Ry.—Gross earnings for April, $22,646.78; expenses, $17,113.33; net earnings, $5,533.45; deductions, $2,371.25; net income, $3,162.20, against $20,671.96, gross earnings. $15,684.03, expenses; $4,987.93, net earnings; $2,363.05, deductions; $2,024.88, net income, for April, 1911. Aggregate gross earnings for four months ended April 30, $91,433.19; expenses, $65,378.34; net earnings, $26,054.85; deductions, $9,547.25; net income, $16,507.60, against $81,752.82, aggregate gross earnings; $60,749.97, expenses; $21,029.85, net earnings; $9,363.10, deductions; $10,950.68, net income for the same period, 1911.

Hamilton St. Ry.—Receipts for quarter ended Mar. 31, $118,810, an increase of $30,172 over those for the same period, 1911. The city's percentage and mileage was $11,384.78, an increase of $2,312, as compared with the same quarter in 1911.

St. Thomas St. Ry.—It was recently reported that the debenture liability of the City of St. Thomas, Ont., in respect of the street railway, on Dec. 31, 1911, was as follows:—Original issue guaranteed by the city, maturing in 1928, $50,000. second issue, $7,428.39. The building of the line through the Ross street subway cost $6,067.95, but no debentures were issued on account of this.

Toronto Ry., Toronto and York Radial Ry., Toronto Power Co., etc.—Gross earnings for March, $668,194; operating expenses, $333,371; net earnings, $334,823, against $588,662 gross earnings; $297,931, operating expenses; $290,731, net earnings for March, 1911. Aggregate gross earnings for three months ended Mar. 31, $1,964,549; net earnings, $984,099, against $1,735,136, aggregate gross earnings; $869,857, net earnings for same period, 1911. The gross earnings of the Toronto Ry. alone, for May, were $421,250.82, on which the city percentage and mileage was $81,502.31, against $367,534.65 gross earnings, and $55,198.12, city percentage and mileage, for May, 1911.

Winnipeg Electric Ry.—Gross earnings for March, $298,838; operating expenses, $161,825; net earnings, $137,013, against $316,714, gross earnings; $166,586, operating expenses; $150,128, net earnings for March, 1911. Aggregate gross earnings for three months ended Mar. 31, $917,519; net earnings, $415,338, against $972,359, aggregate gross earnings; $455,349, net earnings for same period, 1911.

Street Railway Situation in London, Ont.

In our last issue reference was made to the work of a street railway expert, in London, Ont., in connection with the operation of the street railway, with a view to submitting a report to the city utilities committee, which is discussing the question of purchase on behalf of the city. The franchise granted to the company expires in 1925, and, under its terms, the company is compelled to make certain extensions to its system, and additions to its general equipment. Suggestions as to the acquirement of the property by the city have been under consideration from time to time, and this was thought to be a good time to take the matter up with the company, in view of the heavy expenditure called for under the franchise. The city council, at a recent meeting, decided to give the company ten days' notice that it intended to enforce the terms of the franchise as to new schedules, etc., or, in case of the company's default, to annul the charter. In commenting on this, a local press report stated that it is believed that in th eevent of the company failing to meet the city's demands, the value of the franchise would be forced down, and the city would get the property for less than it would otherwise cost.

At the recent annual meeting it was announced that the directors had decided on a considerable addition to the steam power plant, and since then, the street railway committee of the city council and the company have come to an agreement as to a number of extensions, details of which we give on another page, under electric railway projects, construction, betterments, etc.

An option was reported to have been held on the stock of the company, at 150, by Hon. Adam Beck, Chairman of the Ontario Hydro Electric Commission, and it is stated that this has been allowed to lapse, on the report oon the railway property, made by an engineer of the commission, on Mr. Beck's behalf.

The report, which has not been published in detail, states that the earnings in 1911 were $279,606, an increase of $85,000 in six years, and a net inrease of $14,000 over 1910. While the earning power is increasing, the company has, it is said, made no provision for retiring the bonds from 1915 until the end of the franchise in 1925, a matter of $30,000 a year. Upon this basis, it is stated that the stock is not valued at more than par.

It is reported that another offer will probably be made by private parties.

The municipal scheme, if carried out, involves the electrification of the London and Port Stanley Ry., and its incorporation in the civic system. The railway is owned by the city and leased to the Pere Marquette Rd.

A deputation of the street railway committee of the city council visited Toronto, May 8, to discuss the question with the Toronto parties interested, but nothing definite was done. It is stated that negotiations are in progress with the Canadian Northern Ry. in connection with the London and Port Stanley Ry.

The Winnipeg Electric Railway Co.

For some time past negotiations have been in progress regarding the transfer of the company's properties to another ownership, but notwithstanding many rumors to the contrary, nothing definite has been done. A bill was introduced in the Manitoba Legislature, last session, for th eincorporation of the Manitoba Power Company, with a capital of $15,000,000, and office in Winnipeg, with power, among other things, to exercise the powers of the Winnipeg Electric Ry. Co., and to take over the whole of the company's properties, and other properties of a similar nature. Among some of the projects which it is stated were to be incorporated under the new company, are the Brandon St. Ry., the Rural Ry. of Manitoba, Winnipeg River Ry., and Winnipeg Northeastern Ry. The proposed incorporators were R. R. Muir, E. B. Reese, D. L. Mather, A. E. Muir and W. R. Mulock.

Considerable opposition was made by the city, and the bill was subsequently withdrawn.

Another bill was introduced for the incorporation of the Winnipeg Electric Co., W. J. Moran, R. D. Guy, E. F. Frith, C. W. Chappell and P. J. Scott being the incorporators, with a capital of $30,000,000, to acquire stocks of other companies, engaged either wholly or partly n the operation of railway, light heat or similar businesses.

The negotiations between the company and the promoters of the first named bill are being continued, the latter having recently approached the city with a view to reaching a general agreement which would enable the deal to go through.

It is stated that the Winnipeg Electric Ry. may be placed under the jurisdiction of the recently formed Public Utility Commission, and that this would relieve the situation so far as the city is concerned, owing to the litigation with the company, as to poles on the streets, etc.

If an agreement with the city is reached, it is stated that the syndicate, of which E. B. Reese is the head, representing the J. P. Morgan interests, will make a new proposal to the company. A press report recently stated that an appraisal of the properties was being made on behalf of the syndicate.

Canadian Street Railway Association.

PRESIDENT, James Anderson, General Manager, Sandwich, Windsor and Amherstburg Ry.; VICE PRESIDENT, P. Dubee, Secretary Montreal Tramways Co.; SECRETARY-TREASURER, Acton Burrows, Managing Director, The Railway and Marine World.

ASSOCIATION'S OFFICE, 70 Bond St., Toronto.

EXECUTIVE COMMITTEE.—E. P. Coleman, Manager of Railways, Dominion Power and Transmission Co.; H. M. Hopper, General Manager, St. John Ry.: J. E. Hutcheson, Superintendent, Ottawa Electric Ry.; C. B. King, Manager, London St. Ry.; D. McDonald, General Manager, Montreal Tramways Co.; M. N. Todd, President, Galt, Preston and Hespeler St. Ry.

ASSISTANT SECRETARY, Aubrey Acton Burrows, Secretary and Business Manager, The Railway and Marine World.

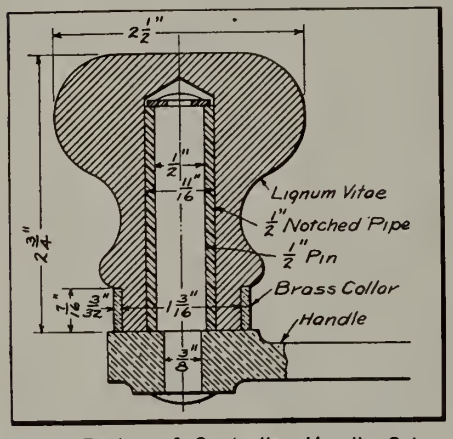
OFFICIAL ORGAN, THE RAILWAY AND MARINE WORLD.

A conference was held at Victoria, B. C., between officers of the British Columbia Electric Ry., and the Provincial Government, May 10, with reference to regulations governing the operation of electric railways and tramways in the province. The company suggests that the present regulations be amended in certain particulars, and the Government promised consideration.

Controller Handle Grip on Halifax Electric Tramways Co's Cars.

The Halifax Electric Tramway Co.'s cars, as they are delivered by the makers, are furnished with the usual type of controller handle grip. D. B. Logan, foreman machinist, having experienced considerable difficulty in maintaining them in good working order, made up a handle to his own design, as shown in the accompanying illustration, which is distinctively original in construction.

The standard design so commonly seen has several undesirable features of construction as observed by Mr. Logan. Principal among these is the tendency the grip has to bind on the supporting pin after the handle had been in service for some time and has been subjected



New Design of Controller Handle Grip.

to varying climatic conditions. The construction of the standard grip is the reason of its inherent weakness in this particular. The wooden body of the grip has a hole bored from end to end through the centre, into which a sleeve is pressed to receive the carrying pin on which the grip is free to revolve. The upper end of the carrying pin is threaded to receive a nut and washer for holding the parts together as a unit. This nut and washer are contained in a recess in the top end of the grip. As a filler to cover the opened end of the handle and to present a smooth end surface, there is inserted a tapered wooden plug, glued into the end. This construction would seem to be its undoing. The grip, when exposed a number of times to a damp atmosphere, or if for any reason it should be roughly used, has been found by Mr. Logan to let the end pin loosen and allow moisture to enter around the centre pin. This will in time cause the centre pin to rust, and if allowed to proceed sufficiently far, the grip will seize and no longer revolve on its centre pin. This is a cause of annoyance to the motorman, and the results from the efforts made by him to move it frequently result disastrously to the grip. Another factor of annoyance in this construction occurs from the moisture collected inside the grip, splitting it.

These drawbacks would seem to have been overcome in the design of grip produced by Mr. Logan. As before, there is a central pin rivetted into the brass handle of the controller. This pin, ½-in. in diar., is ⅜-in. diar. at the lower end, where it passes through the controller handle, and is ¼-in. diar. at the upper end to receive a thin washer. Previous to rivetting over the end on the washer, a section of ½-in. pipe is slipped over the pin. This pipe section is notched with a cape chisel all over its outer surface, the resulting fish-hook projections pointing downwards. The grip is made from lignum vitæ, on account of its great durability. It is made to the shape indicated, and has a tight fitting brass collar on the lower end to prevent the grip from splitting upward from that point. The bore of the grip is made a snug fit on to the pipe before the latter has its surface notched, and then both parts—that is, the pin and pipe section and the grip—are pressed together in a vise or any other convenient means of compression, forcing the wood down over the fish-hook projections, which, projecting downward, offer little resistance to the downward passage of the wooden grip. The projections prevent the grip from working off when once assembled.

This construction of grip has been found most satisfactory, having a remarkable degree of durability. Many of the drawbacks existing in the other type of handle are not to be found. In the first place, there is no plug to work loose and allow moisture to enter and rust the inner parts nor is there any other means of moisture entering. Likewise, the tough quality of the wood reduces the possibility of its splitting to a negligible quantity. Graphite placed in around the pin when being assembled in the first place, provides ample lubrication at all times.

Crane Car for Ottawa Electric Railway.

The accompanying illustration shows a handy crane car constructed for the Ottawa Electric Ry., and which was put in service last fall. The body was originally that of an old nose plough, with the superstructure removed and a 2-ton Brown Hoisting Machinery Co.'s crane placed at one end of the car body over the truck.

The car is 33 ft. long, with a short closed-in compartment at one end like a typical work car. The 2-ton crane on the open part of the car is hand operated, and has a clear swing in all directions. It is equipped with four 38B Westinghouse motors, mounted one on each axle, and operated from a K12 General Electric controller. It is also equipped with air brakes.

Crane Car for Ottawa Electric Railway.

In the winter this car is used on its old service for removing snow on the surburban lines, having a large steel plough attached to the front for that purpose. This plough is raised and lowered by air pressure. The car is thus a double utility outfit, adaptable for service at all seasons. The crane feature in particular has been especially valuable at different points over the system in assisting in the loading and unloading of track materials, equipment, etc., and in general utility work.

Electric Railway Notes.

The London Street Ry. is in the market for six new cars. The size and style have not been decided on.

The Regina Municipal Ry. has received two single truck city cars from the Preston Car and Coach Co.

The Toronto and York Radial Ry. has received two express cars from the Preston Car and Coach Co.

The London and Lake Erie Ry. and Transportation Co. has received four passenger cars from the U.S.

The Edmonton Radial Ry. has ordered 15 passenger cars, two spare trucks, one work car and one flat car, in the United States.

Cable advices state that the city of Aberdeen, Scotland, has adopted the pay-as-you-enter system for its double deck electric cars.

John Baxter has been appointed acting Superintendent, Edmonton Radial Ry., vice H. Doughty, Superintendent, who resigned Mar. 31.

The Moose Jaw Electric Ry. has ordered one 21 ft. single end, convertible, pay-as-you-enter car body, 31 ft. over all, from the Ottawa Car Co.

E. A. Robert, President, Montreal Tramways Co., was elected a member of the Legislative Assembly for Beauharnois, in the Quebec elections, May 15.

The Lethbridge Municipal Ry. has ordered five double truck city cars, 41½ ft. long, and five single truck city cars, 32 ft. 8 ins. long, from the Preston Car and Coach Co.

The Winnipeg Electric Ry. is negotiating with the city council to sprinkle all the streets on which the cars operate for $4,000 a year. The agreement, if approved by the council, will run for three years.

A bylaw to bring all the public utilities of Winnipeg under the recently constituted Manitoba Public Utilities Commission was read a second time by the city council, May 8. Further consideration of the matter was adjourned.

The New Brunswick Public Utilities Commission has directed the Moncton Tramways, Electricity and Gas Co. to issue eight tickets for 25c on its electric line in Moncton, N.B., to be used by all between 6.30 and 7.30 a.m., between noon and 1.00 p.m., and between 6 and 7 p.m.

A delegation from the American Electric Railway Association, which has been making a trip through the United States to the Pacific coast, visited Vancouver, B.C., May 15, when a public reception was held under the auspices of the B.C.

Electric Ry. and the Vancouver board of trade.

Following the passing of an act by the Ontario Legislature, granting, among other things, the right to operate motor busses on the streets, the city of Toronto has authorized the purchase of five double deck motor busses at $10,000 each. They will be operated from the centre of the city to the Rosedale district.

The Toronto Ry. employes are asking for advances of wages to 28c and 30c an hour, an eight hour day on Sunday with time and a half pay, and free uniforms. The present agreement, which provides for 21c, 23c and 25c an hour, with first year men paying the whole cost of uniforms, second year men paying one half, and third year men having free uniforms, expires June 16.

Jas. Roosevelt, who, in Oct., 1911, was appointed Manager of the Transportation and Sales Departments, British Columbia Electric Ry., Vancouver, with supervision of the company's tram systems, both urban and interurban, on the main land and Vancouver Island, as well as the control of the sale of light and power at all points of the company's territory, has resigned.

W. H. Elson, heretofore Trainmaster, Interurban Lines, New Westminster, Lulu Island and Eburne, British Columbia Electric Ry., has been appointed Superintendent, District 1, covering Vancouver-New Westminster interurban line; District 4, covering Burnaby Lake Line; the New Westminster city lines, and terminals at New Westminster and Carrall St., Vancouver, with office at Vancouver.

The Dominion Power and Transmission Co. has received three double truck city cars for its Hamilton, Ont., service, from the Preston Car and Coach Co. They are 30 ft. long over bodies, with omnibus sides, double ends, 42 ft. long over all, finished inside with cherry, agasote ceilings, ⅜ in. agasote panelling on the outside instead of wood, which is a new departure, and are mounted on 27-G-1 trucks, with 4½ ft. wheel base.

The case of the Winnipeg Street Ry. against the city of Winnipeg came before the Manitoba courts, May 27. The company is applying for a declaration that it has the right to maintain, operate and extend its present overhead system without interference, and for an order to compel the council to remove its poles and overhead system, which are in too close proximity to the company's system. Other orders and injunctions are also asked for, which affect the company's power and gas franchises.

E. Sterling, who has been appointed Superintendent, District 2, covering Lulu Island and Eburne-New Westminster line; District 3, covering Fraser Valley Branch, British Columbia Electric Ry., New Westminster, was born at Thornbury, Ont., Oct. 3, 1875, and entered railway service May, 1891, since when he has been, to Oct., 1896, operator and agent, C.P.R.; Oct., 1896, to Mar., 1897, train dispatcher, C.P.R., Smelter Jct., B.C.; Mar., 1897, to July, 1909, conductor, C.P.R.; July to Oct., 1900, acting Trainmaster, C.P.R., Nelson, B.C.; Oct., 1909, to May 1, 1911, Chief Dispatcher, B.C. Electric Ry.; May 1, 1911, to May 1, 1912, Division Trainmaster, B.C. Electric Ry., New Westminster.

A short time since a committee of employes of the Ottawa Electric Ry., appointed by Division 279 of the Amalgamated Association of Street and Electric Railway Employes, waited on Superintendent Hutcheson to present some 29 requests on the question of wages, hours of work and working conditions. Mr. Hutcheson declined to deal with representatives appointed by a union, but expressed his willingness to meet a committee of the conductors and motormen. The men applied to the Minister of Labor for a board of conciliation, which has been granted. Travers Lewis, K.C., has been appointed to represent the company, P. M. Draper to represent the men, and Judge MacDougall, of Hull, Que., is chairman.

Following are the chief details of the 22 interurban passenger cars, which the British Columbia Electric Ry. is having built at St. Louis, Mo., as mentioned in our last issue:—

Length over body	40 ft. 0 ins.
Length of each platform from end of body to outside vestibule sheathing	4 ft. 8 ins.
Length over vestibules	49 ft. 4 ins.
Length over bumpers	50 ft. 8 ins.
Width at sill including panels	8 ft. 5 ins.
Width over posts	8 ft. 4⅝ ins.
Extreme width	8 ft. 7 ins.
Height from rail over trolley boards	13 ft. 4½ ins.
Height from rail to under side of sill	3 ft. 3 ins.
Height from rail to top of floor	4 ft. 2 ins.
Height from rail to centre of drawbar	2 ft. 10½ ins.
Wheel base of truck	6 ft. 6 ins.
Wheels, diar.	34 ins.
Truck centres	27 ft. 10 ins.
Seats	Walkover reversible
Trucks, type	M.C.B.

E. L. Milliken, whose appointment as Manager, Cape Breton Electric Co., Sydney, N.S., was announced in our last issue, graduated from the Technical High School, Springfield, Mass., in 1905, and obtained the B.Sc. degree from the University of Maine in 1908. He has been engaged at different times with the Westbrook Electric Light and Power Co., Westbrook, Me.; Bodwell Water Power Co., Oldtown, Me., and in the Track Maintenance Department of the Bangor and Aroostook Ry. In 1908 he entered the Stone and Webster Management Association's Statistical Department, and in the same year was transferred to the Cape Breton Electric Co., Sydney, N.S., and has since held the position of solicitor, Superintendent of Distribution, and Superintendent of Lighting.

W. M. B. McDonald, heretofore Assistant Superintendent of Lighting, Cape Breton Electric Co., Sydney, N.S., has been appointed Superintendent of Lighting, vice E. L. Milliken, who was appointed Manager on the resignation of H. C. Foss, as announced in our last issue. Mr. McDonald graduated from McGill University with the degree of B.Sc. in 1907, when he entered the service of Allis-Chalmers-Bullock, Ltd., Montreal. He was later a demonstrator in the electrical laboratory at McGill University, and in 1909 was appointed foreman of the meter department of the Pensacola Electric Co., Pensacola, Fla., and transferred to the Cape Breton Electric Co., Sydney, N.S., Jan., 1912, as Assistant Superintendent of Lighting. Both of the companies named are under the Stone and Webster Management Association.

Allan Purvis, who has been appointed Manager of Interurban Lines, British Columbia Electric Ry., New Westminster, was born at Batavia, Java, June 29, 1878, and educated at the Merchant Taylor's school, Liverpool, Eng. He entered railway servise at 12 years of age, with the C.P.R., being successively, Aug., 1890, to Feb., 1891, messenger, Stores Department; Feb. to Nov., 1891, storesman; Nov., 1891, to Sept., 1892, junior clerk at Vancouver, B.C.; Sept., 1892, to Aug., 1893, timekeeper, Donald, B.C.; Aug., 1893, to Oct., 1894, clerk, Vancouver, B.C.; Oct., 1894, to Mar., 1895, assistant storekeeper, North Bend and Kamloops, B.C.; Mar., 1895, to Sept., 1896, clerk and operator, Car Service and Fuel Department, Vancouver, B.C.; Sept., 1896, to Jan., 1899, chief clerk, Fuel Department, Vancouver, B.C.; Jan., 1899, to Feb., 1908, chief clerk to General Superintendent, Vancouver, B.C.; Feb. to Nov., 1908, Superintendent, District 4, Central Division, Souris, Man.; Nov., 1908, to Oct., 1909, Superintendent, District 3, Pacific Division, Nelson, B.C.; Oct., 1909, to Oct., 1911, Local Manager, Fraser Valley Branch, British Columbia Electric Ry., Vancouver, at which latter date he resigned.

Remodeling British Columbia Electric Railway Cars.

The company has about completed the remodelling of 27 interurban cars which were formerly equipped with four 50 h.p. motors and k-14 controllers. Seventeen of the cars are bieng altered to the General Electric Co.'s type m multiple unit equipment, consisting of four 75 h.p. motors and c-60 trucks. Ten cars, which are of lighter type, with less seating capacity, are being equipped with the Westinghouse type h.l. pneumatic control, with four 50 h.p. motors.

All of these cars are arranged for train operation, and those fitted with 75 h.p. motors will be available for service on the Fraser Valley line, the regular equipment of the cars on this division being similar as to control and motors.

The 17 large cars have each a seating capacity of 56 persons, 20 in the smoker, and 36 in the general compartment. The smaller cars seat 44 people, 10 in the smoker and 34 in the general compartment.

Fake Accident Cases in Toronto.

Following on the fake accident claims recently made against the Toronto Ry., as mentioned in our last issue, the charges of conspiring to fabricate evidence, and contempt of court were taken up at the Assizes held at Toronto, May 16, against J. W. Curry, K.C., J. H. Forrest, Claims Agent, Toronto Ry., A. Burnett and W. E. Smalling, detectives, the grand jury having thrown out the bill against R. J. Fleming, General Manager, Toronto Ry. The defendants, who pleaded not guilty, admitted indiscretion, and tendered a full apology. J. W. Curry, K.C., having been given leave, made a personal statement, to the effect that he had been called in consultation, and certain information placed before him which had been obtained from the Toronto Ry.'s special officer, A. Burnett, and subsequently, papers connected with the case and later reports were sent to him. The points on which he was consulted were the criminal prosecution of the medical man concerned, or the bringing of the case before the discipline committee of the Ontario Medical Council. He, having heard that the solicitor acting for Burnett was seeking instructions to issue a writ against the company, instructed that such instructions should not under any circumstances be given, and he had no idea that any civil action would be taken. What was in mind was the obtaining of sufficient evidence to bring the doctor before the Medical Council, and not to bring the court into contempt in any way. Since the case had been brought he had given the matter a great deal of consideration, and realized that the proper course for him to have taken was to have refused to go to court with the case and to have notified counsel for the then plaintiffs that there was no cause for action, and that coming into court with an action of that kind was an impropriety for which he could offer no defence.

Justice Latchford, who stated that there was nothing meretorious in the matter from beginning to end, decided that in view of the apologies tendered, the case need proceed no farther. He also stated in respect to the counsel who acted for the plaintiffs in the damage cases, that he was deceived, as anyone in the same position must have been, and that there was no imputation that he had acted in an unprofessional manner.

The grand jury returned a no bill against Dr. A. H. Garratt on a charge of wilfully obstructing a court of justice.

Electric Railway Projects, Construction, Betterments, Etc.

Alberta Interurban Ry.—See Railway Development, elsewhere in this issue. The line was originally projected as an electric railway, but has been renamed and proposes to run by steam or individual motor cars.

Bassano Electric Power and Development Co.—We are advised that no active steps have yet been taken towards the building of this company's projected railway from Bassano, Alta. Permission is being sought from the Board of Railway Commissioners to cross the C.P.R. tracks at Bassano, and from the Dominion Government to carry the line across an Indian reserve. A franchise has been secured from the town of Bassano, and preparations have, it is said, been made to start construction as soon as the permissions mentioned above have been obtained. (Mar., pg. 147.)

Berlin and Northern Ry.—The Ontario Legislature has changed the name of the Berlin and Bridgeport Electric St. Ry. to that of the B. and N. Ry. (See Berlin and Bridgeport Electric Ry., April, pg. 196.)

Berlin and Waterloo Electric Ry.—The Berlin, Ont., city council is being asked to submit a bylaw to the ratepayers to provide $17,000 for the purchase of two new cars, and to build new car barns. (Oct., 1911, pg. 973.)

Brandon, Man.—A bylaw confirming an agreement between the city council and J. D. McGregor for the building of an electric railway in the city was voted on by the ratepayers May 21. The agreement provides that after its final execution the contractor will proceed with the construction of the railway, and have five miles completed by Dec. 1, and an additional two miles by June 1, 1913. The line to be standard gauge, laid with 70 lb. T rails. The contractor is to take over the track already laid or in progress of laying by the corporation at the original cost. The franchise is to extend for 30 years, and provision is made for the building of additional lines as required. The contractor undertakes to obtain the necessary act authorizing the building of the line, and to pay the corporation 3% of the gross earnings after it has been in operation five years, for a period of ten years; 4% for the next ten years, and 5% for the remainder of the term. Upon giving a year's notice the city can take over the line on termination of the franchise at replacement value, or renew the franchise for further periods of five years each. (See Brandon Electric Ry., May, pg. 251.)

British Columbia Electric Ry.—It is proposed to reconstruct the track on Hastings St., Vancouver, between Cambie and Main Streets, as soon as the Grenville St. reconstruction has been completed.

Construction has been resumed, west from Main St., Vancouver, of the line on Sixteenth Ave., towards Oak. This line will be double track except on the portion of the avenue which is within the Point Grey municipality, where a single track will be laid on the side of the avenue within the city.

At a meeting of the Burnaby board of works, May 1, an arrangement was entered into for the building of a line on Royal Oak Road, from the main line to the Government prison farm. The line is being built for the Provincial Government by the company and will be operated by the company under a special agreement, the Government protecting the municipality.

A conference has been arranged between the company and the municipalities affected by the proposed cut off from Highland Park to New Westminster, for the settlement of certain difficulties which have arisen in respect of street crossings, and as soon as these matters have been adjusted construction will be resumed. This cut off passes through Burnaby municipality.

The Sixth St. extension in New Westminster has been completed and was put in operation May 6.

A contract is reported to have been let to Franklin and Sheppard for grading on Nanaimo St., from Hastings St. to Broadway, Vancouver. Provision will be made for a double track line, although it is only proposed to lay a single track at present. A contract is also reported to have been let to the same firm for grading for the second track on Fraser Ave., south from Twenty-fifth Ave., South Vancouver.

The laying of second track on Superior and Niagara Streets, Victoria, has been completed. (May, pg. 248, and April, pg. 196.)

Coquitlam, B.C.—Application is being made to the municipality in which the Coquitlam, B.C., townsite is situated, by the Minnekhada Ranch Co., for the right to lay a tram line through the town. The company wants a tram line from the C.P.R. at the junction out to the ranch, five miles, and do not want a general franchise. The line would be built within three years, and the contract would run for 25 years, and if the municipality did not then buy out the company's rights, the franchise would be automatically renewed for a further 25 years. The proposed agreement was referred to the municipality's solicitors for consideration. H. L. Jenkins is president of the company.

Dunnville, Wellandport and Beamsville Electric Ry.—The Ontario Legislature has extended the time within which the company may build its line from Dunnville to Beamsville, Ont., and has authorized it to use any form of motive power. (Feb., pg. 91.)

Edmonton Radial Ry.—We are officially advised that the following improvements, extensions, and additions to plant will be made during this year:—Paving on 9,050 ft. of streets on which double track is laid, and 7,600 ft. of ballasting on improved streets. Track extensions — Spruce Ave., connecting Kirkness St. with loop at Park St., double track, 55,300 ft. paved and 500 ft. ballasted; First St. to Twenty-fourth St., via Wilson and Short Avenues, double track, 3,700 ft. paved, 2,000 ft. ballasted; Saskatchewan Ave. and Murtle St. to south side of bridge, double track, 3,700 ft. open; Strathcona east extension, 4,000 ft. single track ballasted; Fifth St. west, Strathcona from bridge to Whyte Ave., double track, 2,330 paved, 1,320 ft. ballasted. Additional plant for the substation, and a testing equipment is now on order from the Canadian Westinghouse Co. (May, pg. 251.)

Edmonton Radial Ry.—A contract has been let by the Edmonton, Alta., city council, to Manders and Gregory for excavating, grading and paving on the extensions of the municipal street railway. The steel and other material to be provided by the city is in course of delivery. (May, pg. 251.)

Flathead Interurban Ry.—An enquiry has been made by D. R. McGinnis, President, F.I. Ry., if the Calgary, Alta., city council was willing to encourage the building of an electric railway between that city and Kalispiel, Mont.

Greenwood-Phœnix Tramway Co.—We are officially informed that the tunnel under the mountain at Phœnix, B.C., has been driven for 3,000 ft., and that work has been closed down for over three months. No definite information is available when work will be resumed. The tramway is to connect Greenwood and Phœnix, B.C., and it is intended entirely as a mining transport tunnel. The full length of the line will be underground for between 17,000 and 18,000 ft. The tunnel will be 9 by 9 ft. in the clear. The material up to the present has been hauled out by horses, but later it is intended to install electric power, which will be obtained from the South Kootenay Power and Light Co. at Bonnington Falls on the Kootenay River, south of Nelson. The tunnel is being built with the intention of using a 10 ton car, but whether this size will be used or not will depend entirely upon the amount of ore to be handled. D. McIntosh, Greenwood, B.C., is manager. (May, pg. 251.)

Halifax Electric Tramways Co.—Two measures affecting the company's railway were under consideration at the recent session of the Nova Scotia Legislature. The first sought to restrict the dividends to 8%, to prevent further capitalization, and to divide profits with the city after certain provisions had been made for extensions, while the second sought to compel the city to make extensions in a certain district. The measures were opposed, the first by the company and the other by the city, with the result that a compromise was arranged, under which some amendments were made, and the other matters were left over for a year. (Apr., pg. 196.)

Hamilton Radial Ry.—Engineers are reported to be in the field surveying a line from Oakville, Ont., the present terminus, via Lorne Park, to Port Credit. The route will, it is said, be along a private right of way, and an endeavor will be made to so locate it that it will have a station adjoining the Mississauga Golf Club, on the Credit River, between Port Credit and Lorne Park. (Apr., pg. 196.)

Hamilton St. Ry.—Discussing about railway matters, May 8, Manager Coleman is quoted as having stated that the great problem was to relieve the congestion on James St., between Barton and King Streets, and one of the suggestions made to effect this was to loop up Barton and King St. by a cross line on Ottawa St. (May, pg. 251.)

Humber Valley Electric Ry.—The Ontario Legislature has incorporated a company with this title to build a railway from Dundas St., Lambton, to the Humber River, southerly along the west bank to Bloor St., thence along the east bank of the river to the Lake Shore road, and thence easterly to Sunnyside Ave. R. H. Smith, C. M. Garvey, F. Regan, W. J. Jackson are the provisional directors. (Apr., pg. 196.)

Hamilton, Waterloo and Guelph Ry.—J. Patterson, Hamilton, is quoted as stating that the projected line from Hamilton to Guelph, Ont., will be gone on with this year, and that the extension to Toronto will come later. Press reports state that the intention is to connect up the Hamilton end of the line with the Hamilton Radial Ry., run over that line to Oakville, and build a new line into Toronto. (May, pg. 251.)

Kawartha Transportation Co.—The Ontario Legislature has incorporated a company with this title to build railways from Peterborough to Lakefield, Clear Lake, Stoney Lake and Apsley; from Peterborough to Chemong Lake, and from Peterborough to Rice Lake. The provisional directors are L. H. Grahame, E. R. Tate, C. W. S. Dunn, H. G. Fitzgerald, Lakefield, Ont. R. B. Rogers, L. M. Hayes, Peterborough, Ont. (May, pg. 196.)

Lacombe, Alta.—E. K. Strathy, President, is quoted as having stated that financial arrangements for the building of his company's line have been practically completed. The line is projected to run along Bennett Ave., Lacombe, westerly to Gull Lake. It is said that the right of way has been secured, and that

a large area of land has been laid out at Gull Lake as a summer residential park and pleasure resort. There are two charters in existence for electric railways radiating from Lacombe, but the press dispatches do not indicate which is interested in the present project. (See Lacombe and Blindman Valley Electric Ry., and Lacombe, Bullocksville and Alix Electric Ry., Dec., 1910, pg. 1069.)

The London and Lake Erie Ry. and Transportation Co. is preparing to erect a shop in St. Thomas, Ont., this summer, to be 210 by 91 ft., one story high, and built of brick. It will be divided by a brick wall, each half containing two tracks capable of accommodating four cars each. Under three of the tracks pits will extend from the front half way back, and under the fourth track the pit will extend the full length of the building. Accommodation will be provided for the master mechanic and other officials and operating staff, with stock room, etc. A request has been made to the St. Thomas city council to put in additional switches for the new shops on Talbot St. A contract for erection has been let to G. A. Ponsford.

Two propositions have been put forward with the object of securing an electric railway to Port Burwell. One is for a line starting from London and passing through Milestown, Orwell and Aylmer, and the other is a direct line from St. Thomas to Aylmer, from which point the two propositions run parallel to Port Burwell. The latter proposition seems to meet with most favor. Representatives from the three townships through which the proposed line would pass waited on the directors of the company and discussed the matter in April, and a further meeting was held May 3, when the representatives of the townships expressed themselves favorable to guaranteeing the company's bonds for $20,000 a mile, and agreed that a committee be formed to apportion the amount on the four municipalities interested. The directors went over the proposed route in company with the township representatives and J. A. Bell, county engineer. The line will be an easy one to build, the only difficult piece of work on the route being the crossing of a ravine at New Sarnia.

The projected extension of the line from Lambeth to Delaware, six miles, was discussed with the directors by representatives of Delaware tp., May 2. The township offers a free right of way and a guarantee of bonds. The directors promised consideration of the proposal.

Representatives of municipalities interested recommended, May 8, that the townships be asked to guarantee the company's bonds for $10,000 a mile towards the cost of extending the line from St. Thomas to Aylmer. The company asked a guarantee of $20,000 a mile.

A proposition is under consideration for the building of a line from Ingersoll to London, and some approaches have been made to the company. General Manager Mower is quoted as stating that if a definite proposition is made the directors will consider it. (May, pg. 252.)

London, Aylmer and North Shore Electric Ry.—In connection with the projected electric railway to Aylmer mentioned under the title of the London and Lake Erie Ry. and Transportation Co., the first route spoken of is that originally proposed to be followed by the L.A. and N.S.E. Ry., which was incorporated by the Ontario Legislature in 1901. The London and Aylmer boards of trade are endeavoring to have the charter revived and a meeting was held in London, May 3. It was reported that the L.A. and N.S.E. Ry. Co. had not sold any common stock, but had issued 5% bonds, selling some and giving others in payment for services rendered. There were also outstanding 160 shares, and W. Warnock, of Aylmer, held a judgment of $10,000 against the company. It was decided to ask the municipalities to agree to the guaranteeing of bonds for $300,000 as a preliminary to applying for a renewal of the charter. Dr. Sinclair, Aylmer, Ont., is interested in the project. (Oct., 1910, pg. 875.)

London St. Ry.—We are officially advised that the company has practically agreed with a committee of the London, Ont., city council upon certain changes and extensions of the tracks. The Wellington St. line is to be removed to Richmond St., thus straightening out one line, and a branch or belt line from this through Cheapside St. and William St., connecting with the present line on Oxford St., is to be built. A line is to be built from the end of the Oxford St. line at Adelaide St., on Adelaide St. to Central St., crossing the C.P.R. near the latter point. Three places on the system where the traffic is too heavy for single track are to be double tracked. These are on the Hamilton road from Rectory to Mamelton St., on Horton St. from Richmond to Wellington St., and on York St. from Ridout St. to the bridge. The tenders for the several works are not yet all in, consequently no definite decision has been reached as to who will do the work or when it will be gone on with. The company has been informed that another proposition is to be made by the Hydro-Electric Commission with regard to the supply of power.

Plans have been prepared by Moore and Munro, architects for a new powerhouse for the company, the estimated cost of which is $15,000. (April, pg. 197.)

Moncton Tramways, Electricity and Gas Co.—We are officially advised that a change has recently been made in the control of the company, T. N. Barnsdall of Pittsburgh, Pa., and associates having acquired a majority of the stock. The following are reported to have been elected directors and officers:—President, R. Law, jr.; Vice President and General Manager, E. B. Reeser; directors, D. Henderson, F. W. Summer, O. P. Boggs, H. C. Stuart, O. E. Bartlett, H. N. Price is Superintendent of Tramways and Electricity, and A. B. Farmer, Superintendent of the Natural Gas Department.

The new management, we are advised, is devoting its energies chiefly to the introduction of natural gas at first, and the question of the street railway and its extensions is in abeyance. In all probability there will be some alterations in the routes proposed to be followed in the extensions as arranged by the former management. The company was restricted by its act of incorporation from using T rails, but as the use of grooved rails has proved unsatisfactory to both the company and the city, arrangements have been made with the city council to use T rails on all but paved streets. The work of completing the first section of the line is being gone on with. Natural gas has been installed under the boilers in the power house, thus doing away with coal. It is proposed to take up the question of extensions at an early date. (Mar., pg. 148.)

Morrisburg and Ottawa Electric Ry —The Ontario Legislature has extended the time within which the line authorized by chap. 130, statutes 1909; as amended by chap. 145 statutes 1910, may be built. (Apr., pg. 197.)

Montreal and Southern Counties Ry. —Press reports state that contracts will be let at an early date for about 25 miles of extensions, and that a contract has been let to the Byers and Anglin Co. for the building of car barns, repair shops and offices in St. Lambert, Que. (May, pg. 253.)

Montreal Tramways Co.—Negotiations are in progress between the company and Canadian Northern Ry. interests for the establishment of a street car service in the new suburb being laid out by the railway company at the back of Mount Royal. (May, pg. 252.)

Moose Jaw Electric Ry.—A site of 25 acres for park purposes has been secured by the company on the river, about two miles from the post office at Moose Jaw, Sask. Track is to be laid to the park at the earliest possible date. (Mar., pg. 148.)

Mount McKay and Kakabeka Falls Ry.—A proposition has been submitted to the Fort William, Ont., city council for running rights for the company over the street railway in Fort William, Ont. The company proposes to use large electrically driven cars.

The Ontario Legislature has extended the time within which the company may complete its projected lines and has authorized an increase of capital stock from $250,000 to $500,000. (May, pg. 252.)

Niagara Falls, Welland and Dunnville Electric Ry.—An act has been passed by the Ontario Legislature authorizing the increase of capital stock from $200,000 to $500,000, and the bond issue from $20,000 to $30,000 a mile of line; authorizing the company to generate and dispose of electrical power, and extending the time within which its railway may be built. (May, pg. 252.)

Niagara, Welland and Lake Erie Ry. —A route plan for lines in the vicinity of Welland, Ont., has been approved by the Minister of Railways.

The Board of Railway Commissioners has approved location plans for the line between the G.T.R. on Main St. and the Michigan Central Rd. on South Main St., Welland, Ont., 1.5 miles. (May, pg. 252.)

Niagara, St. Catharines and Toronto Ry.—The St. Catharines, Ont., city council has under consideration a bylaw granting a franchise to the company to build a line on Niagara St., as a part of a proposed line to Niagara-on-the-Lake. The route proposed to be followed is along Niagara St. to the Lake Shore road, and along that road to Niagara-on-the-Lake, with spur lines. It is said that a route map of the line to Niagara-on-the-Lake has been filed at Ottawa and that the extension will be built this year. (May, pg. 252.)

Nipissing Central Ry.—The work of extending the line from Haileybury to New Liskeard, Ont., was started May 6, and over 100 men with a steam shovel are engaged on the works. (Apr., pg. 197.)

North Midland Ry.—The Ontario Legislature has extended the time within which the company may build the lines authorized by its several acts, from London through the counties of Middlesex, Perth and Huron, and from London to Toronto. (Mar., pg. 149.)

Ottawa Electric Ry.—The Ottawa city council was informed, May 9, that the company would lay tracks along Pretoria Ave. on the construction of a bridge over the Rideau canal; tracks on Queen St. to relieve the Sparks St. congestion; a double track on Broad St. from the C.P.R. station to Queen St. and along that street to a connection with the Bridge St. line. This latter line will, it is said, be started almost immediately. (May, pg. 252.)

Ottawa Electric Ry.—The Ottawa, Ont., city council has under consideration plans for laying tracks on Queen St. and Laurier Ave., as a temporary measure of relieving the congestion at the corner of Bank and Sparks Streets. (May, pg. 252.)

Ottawa, Rideau Lakes and Kingston Ry.—An act has been passed by the Ontario Legislature changing the title of

the Ottawa, Smiths Falls and Kingston Ry. to that of the O.R.F. and K. Ry., extending the time within which the line authorized by chap. 127 statutes 1910 may be built, and authorizing the building of an additional line from Ottawa to Manotic and through the townships of Gloucester and Osgoode, in Carleton county. (See Ottawa, Smiths Falls and Kingston Ry., Mar., pg. 149.)

Lethbridge Municipal Ry.—A contract was let by the Lethbridge, Alta., City Council, May 8, to the Wisconsin Steel and Ironworks, for the erection of car barns for the street railway now under construction as a municipal enterprise. Superintendent Reid reported that the branch on Sixth avenue was baliasted, while progress had been made with the paving on Fifth street south. The contractors were slow in delivering ties, and he was authorized to purchase two car loads from the C.P.R., so that the work would not be delayed.

We are officially advised that it is proposed to lay 10½ miles of track, some of which will be on double track lines. Construction was started April 8, and to May 7, two miles of line had been completed, and work was in progress on an additional three miles. It is expected to have the entire 10½ miles of line completed in time for the exhibition, which opens Aug. 19. The steel rails and intersections were ordered in the U.S., and delivery has been made. The orders for overhead material were divided up between the Canadian General Electric Co., the Northern Electric Co., the Eugene F. Phillips Electrical Works, the Imperial Wire and Cable Co., and the Ohio Brass Co.

Power is to be generated as alternating current in the power house, about a mile from the city, and changed to 600 volts d.c., at a substation located in the car barns, and from there will be distributed over the line. The plant for the power station consists of one 400 k.w. synchronous motor generator set, and one 200 k.w. synchronous motor generator set. (May, pg. 252.)

Porcupine Rand Belt Electric Ry.—The Ontario Legislature has incorporated a company with this title to build the railway already described in these columns. (Apr., pg. 197.)

Port Arthur and Fort William Electric Ry.—The ratepayers of Port Arthur, Ont., voted May 23 on two by-laws affecting the electric railway lines in the city. The first was to provide $1,400 for replacing 40 wooden poles with iron ones, and the second to provide $11,500 for laying 80 lb. steel rails on the Fort William road. (May, pg. 252.)

Quebec Ry., Light and Power Co.—We are officially advised that while it is altogether likely that the Crown St. line will be extended across the Drouin bridge into Limoliou, and the St. Malo line extended about 0.25 of a mile in the neighborhood of the C.P.R. tracks, nothing definite has been decided upon. The total distance to be built is about 2.5 miles. (May, pg. 252.)

St. John Ry.—The New Brunswick Legislature has authorized the company to extend its railway to points outside the city of St. John, within Kings County. (May, pg. 252.)

Col. H. H. McLean, Vice President, is quoted as stating, May 10, that the company will proceed at once with the laying of tracks on the east side of Courtenay Bay. The new tracks will run down as far as the breakwater, or further if necessary. Including its share of the cost of the new bridge at the reversing falls, the company has made arrangements for spending $250,000 upon improvements this year. (May, pg. 252.)

St. Thomas Street Ry.—Two bylaws were voted on in St. Thomas, Ont., May 13, one for the extension of the street railway lines, and the second for betterments of the existing lines. The first provided for building a cross-over at William St., and to extend the Ross St. line to Wenlock St., and the second provided for spending $23,500 in overhauling the present lines, to purchase three additional cars and to repair the present cars at a cost of $16,500. (May, pg. 252.)

The bylaw authorizing the expenditure of $23,500 on the improvement of existing lines, and to purchase three new cars was approved by 638 to 166 votes, and that to expend $6,500 on two extensions was approved by 565 to 244 votes.

Saskatoon Electric Ry. and Power Co.—A report on the proposed power development on the Saskatchewan River was made to the Saskatoon, Sask., city council, May 8, by H. M. E. Evans. Referring to the street railway part of the undertaking Mr. Evans said he had nothing definite to say, except that the work was being kept well in view. The company had made arrangements for the materials, and there would be no delay in construction as soon as things were ready for going ahead. When it became apparent that the Nutana hill would be the first road ready for the steel, he bought the necessary rails to lay it out of his own private funds.

A proposition is being considered by a committee of the city council for the taking over of the street railway part of the company's undertaking as a municipal work. (May, pg. 252.)

At a special meeting of the city council, May 13, preliminary steps were taken to finace the building of an electric railway in the city as a municipal undertaking, and to release the Evans syndicate from its agreement. Mr. Evans promised to allow the city the use of the company's engineers' reports, and to give whatever aid he could in promoting the building of the line. As to the power plant, the report of the engineers is to the effect that the project at present could not be made to pay. Further consideration of the matter was adjourned, pending consideration of certain proposals being made by Stone and Webster, Boston, Mass.

Simcoe Ry. and Power Co—The Ontario Legislature has extended the time within which the authorized line from Penetanguishene easterly through Victoria Harbor, Sturgeon Bay, Tannerville, Waubaushene and Fesserton to Coldwater, Ont., may be built. (Mar., pg. 149.)

Stratford St. Ry.—The Stratford, Ont., city council passed a resolution, May 2, extending the time for starting construction on the line in the city to June 1, 1912. J. E. Rothery, representing Mackenzie, Mann and Co.'s interests, stated that Stratford would be one of the centres for radiating lines when the company's plans for a comprehensive plan for electric railways had been worked out. It was planned to build an extensive system through all that part of Ontario lying west of a line from Toronto to the Georgian Bay. These would be feeders not only to the Canadian Northern Ry., but to the other railway lines. The main electric line would pass through Stratford, but he could not definitely state the route by which it would reach the city. The terminus on Lake Huron would probably be at Grand Bend. Mr. Rothery subsequently spent a day going over the country between Stratford and Lake Huron. (Mar., pg. 149. See also Toronto Suburban Ry.)

Sudbury-Copper Cliff Suburban Electric Ry.—The Ontario Legislature has incorporated a company with this title to build lines from Sudbury to Copper Cliff, and to Comston with branches. The provisional directors are W. J. Bell, W. Cochrane, J. Markey, D. M. Morin, and L. Laforest, Sudbury, Ont. (Apr., pg. 197.)

Toronto and Eastern Ry.—Ewen Mackenzie, of Toronto, has been given a contract for the construction of this line from Bowmanville east via Oshawa and Whitby, and has started work. The original intention was to make connection with the Canadian Northern Ontario Ry.'s Toronto-Ottawa line at Cherrywood, mileage 17 east of Toronto, and to run over the C.N.O.R. tracks into Toronto, so as to save the heavy expense of a separate entrance. It is now said that it may be decided to build independently right into Toronto. If this is done electricity will probably be the motive power, but should the C.N.O.R. tracks be used between Cherrywood and Toronto gas electric cars will probably be adopted so as not to have to electrify the line between Cherrywood and Toronto. Another proposition is to build a separate line on the C.N.O.R. right of way between Cherrywood and Toronto.

Toronto Suburban Ry.—An act has been passed by the Ontario Legislature authorizing an increase of capital stock to $3,000,000; authorizing the issue of bonds to the amount equal to 75% of the actual cost of power stations, transmission lines, bridges, right of way, etc.; extending the time for the building of its previously authorized lines; authorizing the building of a line from the Hamilton line near Cooksville, and giving power to build the following additional lines:—From Guelph passing through Hespeler and Waterloo to Berlin; from the line to Hamilton in Wentworth tp. to serve Hespeler, Preston and Galt, and from near Cooksville to Brampton and easterly to a junction with the company's line to Weston at Davenport.

Work has been started at Weston on the extension to Woodbridge.

A letter was received, May 5, by the chairman of the Railways Committee in Berlin, from the Secretary of the Canadian Northern Ry., stating that as soon as the direction of the route was settled the company would start with the building of the projected electric line from Toronto to Guelph.

The company has obtained approval of the route for an extension of the present line terminating at Lambton, via Sunnyside, and Dixie to Churchville and Meadowvale, and engineers were out on the route, May 15, making additional surveys. The company's right of way agent is buying property along this route. The charter provides for a line off this through Cooksville to Hamilton. The powers granted last session of the Ontario Legislature provide for a line from what is described as the Hamilton line, near Cooksville, to Brampton, thence easterly to the present line near the G.T.R. station at Davenport. Such a line would connect with the company's present lines at the point whence the line to Bathurst St., along Davenport road, branches off from the line to Weston. It is not improbable that this line, which is to be built on a private right of way, will become the main line from Toronto to Guelph, etc. A contract is reported to have been let to Ewen Mackenzie for the building of the line to Guelph, but details as to route, etc., are not available.

Press reports state that negotiations are in progress for the taking over of the London St. Ry., the London Electric Co., and various other electrical railway and power projects, between Toronto and Windsor, and working them in as part of the system. (Apr., pg. 198. See also Stratford St. Ry.)

Winnipeg Electric Ry.—Work is in progress on the new line on Donald St. between Portage Ave. and Broadway. It is also intended to extend the Broadway line to Sherbrooke St., joining the Portage Ave. line, and to lay tracks on Mountain Ave., from St. John's to McGregor St. Work on these two lines is to be started immediately. It is proposed to lay track on other lines during the summer, but just which ones has not yet been definitely announced. (May, pg. 253.)

Marine Department

Steel Floating Dry Dock for Toronto Harbor.

Constructional work on the steel floating dry dock for the Polson Dry Dock and Shipbuilding Co., Ltd., the original design of which was described in The Railway and Marine World for Sept. and Oct., 1911, is in progress and will be pushed to early completion. The cost of construction, including a complete marine repair plant, is estimated at $900,000, on which the Dominion Government will pay a subsidy of 3% annually for 20 years.

The dock is to be of the sectional U type, and was designed by Wm. Newman, Works Manager, who is a member of the Institution of Naval Architects of England, and also of the Society of Naval Architects and Marine Engineers in the United States. He was sent by the company to visit shipbuilding plants and Admiralty dock yards in Great Britain and on the European continent, and on returning visited various plants on the Great Lakes and Atlantic seaboard, with the object of studying floating dry docks. The result of this trip was that the designs previously made and described in these columns were abandoned and the present ones adopted in their stead.

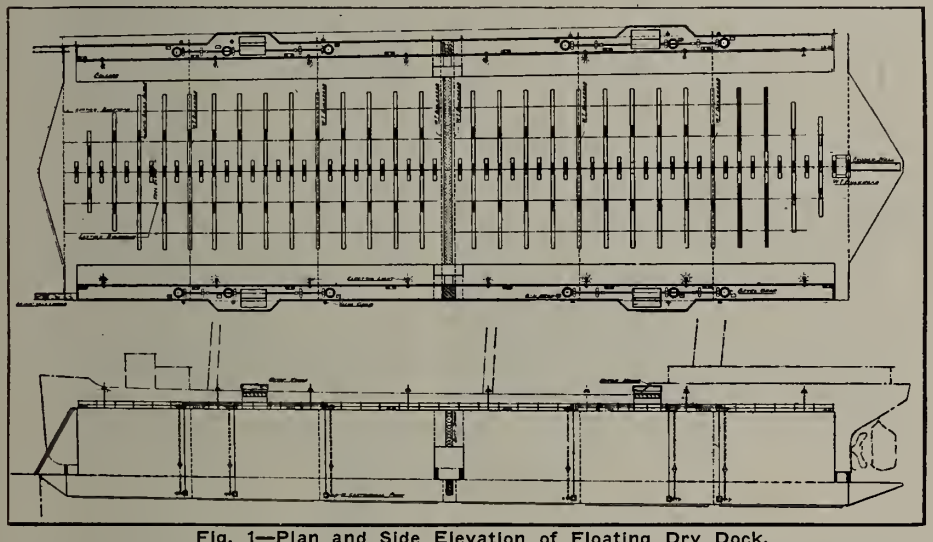


Fig. 1—Plan and Side Elevation of Floating Dry Dock.

The general dimensions of the dock are:—Length, 330 ft.; width, 100 ft.; depth, 35 ft. 4 ins.; inside width on deck, 72 ft.; inside width on top, 88 ft.; and depth of hold, 8½ ft. It will weigh approximately 2,400 tons, and will have a lifting capacity of 5,400 tons. When light it will draw 30 ins. The cost of the dock will be about $392,000.

The construction consists of one longitudinal watertight bulkhead amidships, and a transverse watertight bulkhead every 50 ft., dividing the dock into 12 equal compartments 50 ft. square, with a pump in each. All framing is transverse, 30 in. centres, and the plating is 50% in excess of Lloyd's requirements. Besides the longitudinal watertight bulkhead, there are six longitudinal lattice bulkheads, equally distributed, which, with the sides, insure absolute longitudinal rigidity. There is a transverse truss frame fitted every 10 ft. of ample proportions, which support the bilge block cross tracks. The bilge blocks will have a relieving screw under the top block, and will be of British Columbia fir instead of the usual oak. The fir, being light, gives them a certain amount of floating power, so that they must be held down on the bilge block tracks, underhung wheels attached to the bilge blocks accomplishing this and at the same time making it possible for them to be operated by one man with ease. They will slide down the slight incline of the tracks with but little effort.

The dock consists of two integral parts, identically the same in construction, each composed of three transverse bulkhead sections. These two integral parts are secured together by a 6 x 6½ in. angle rivetted to the ends all around at the mating ends, with 1¼ in. machine bolts through the projecting flanges at a 6 in. spacing, with a rubber gasket between to make watertight. A 30 x ¾ in. butt strap is bolted to the side of the attached ends of the dock above the low water mark. At the inside corners of each section of the dock there are rolling fenders to protect the dock from entering boats striking the corners.

The only opening into each of the watertight compartments of the dock is through a small hatch on the upper deck, which can be sealed in the event of accident and compressed air pumped in to expel the water.

It will be possible with the pump equipment to be installed to completely empty the dock and thereby raise to the full height with the largest size of vessel for which it is designed in 24 mins. The pumping equipment consists of twelve 12 in. centrifugal pumps of the form shown in fig. 3, having a united capacity of 42,000 imp. gals. per minute. These pumps work in batteries of three in each quarter of the dock from a 75 h.p. d.c. motor mounted on the upper deck, driving a horizontal shaft from which the pumps are driven by vertical shafts through bevel gears as indicated in the plan and elevation of fig. 1. The four batteries are centrally controlled from a station ashore, which commands a view of the whole dock. The controller equipment is similar to that on an electric car, and is conveniently arranged for one-man operation.

The entire absence of levers and piping is one of the noticeable features of the dock. This may be noticed by referring to fig. 4, which shows the pump location and the discharge and intake control of the pump. The discharge connection of the pump is a very short flanged pipe coupling attached to the dock wall, and discharging through a gate valve operated from the upper deck of the dock by a long threaded shaft. The volume of the discharge may be regulated by the valve as well as from the central electrical control, by varying the amount of the opening. Outside the valve there is a hinged screen which is swung out of the way by the rush of the discharging water, but which closes when the dock is being filled, the screen preventing the entry of foreign or solid matter. The same opening being used for both discharge and intake accounts for the absence of piping.

The pumping equipment is entirely frost proof, as such a construction was made necessary by the severity of the winter. The manner in which this is accomplished is simple in the extreme, as will be seen from fig. 3. The pumps, it will be noticed, are raised about 2 ft. from the bottom of the dock. Under ordinary conditions, the suction of the pumps is through the four openings opposite the point of the propeller, for, unless a vessel near the full capacity of the dock requires to be raised, the full lifting capacity obtained from completely ejecting all the water is not required. When, however, the full lifting power of the dock is required, or when the dock has to be completely emptied in winter weather, the level of the water is reduced as low as possible through the side openings. These openings are then plugged and the water drawn up through a sump running lengthwise of the dock, the body of the dock being thereby completely drained. To free the pump itself of all water, a drain plug is provided on the lower side of the largest part of the casing. This leaves the pump absolutely dry and frost proof in consequence. The construction of the sump of a channel as indicated in figs. 3 and 4 is a new construction. It was felt that to cut the transverse truss frame on each side to accommodate a sump on the level of the dock bottom would weaken that member at a point where it could least stand it—near the tension edge.

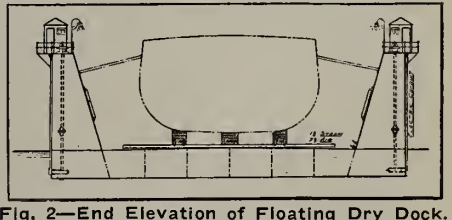


Fig. 2—End Elevation of Floating Dry Dock. at Edson, Alta.

There will be conipressed air, steam, and electric power conduit systems run on both sides of the dock, with manifolds every 20 ft. for operating the tools. Sixteen arc lamps will be hung from the upper deck with plugs for drop light every 10 ft., thereby permitting of continuous work when necessity requires.

Four ship's capstans are situated on the upper deck to handle the ship lines when docking. Another feature is the mooring device. An I beam is rivetted perpendicularly to the outside of the dock opposite each of the bulkheads. These I beams are held in loose clips on the edge of the wharf, allowing the dock to raise or lower, and, if necessary, to list, without any adjusting.

The dock, as at present being constructed, will be large enough for the largest vessel now navigating Lake Ontario, which is the G.T.R. car ferry Ontario No. 1. This vessel is 317 ft. long between perpendiculars, and weighs

5,146 gross tons. It is the intention, however, to increase the length of the dock at some future date by the addition of a central portion 300 ft. long, similar in construction to the end portions without the platform ends. This will make the capacity of the dock 630 ft., which it is expected will meet all

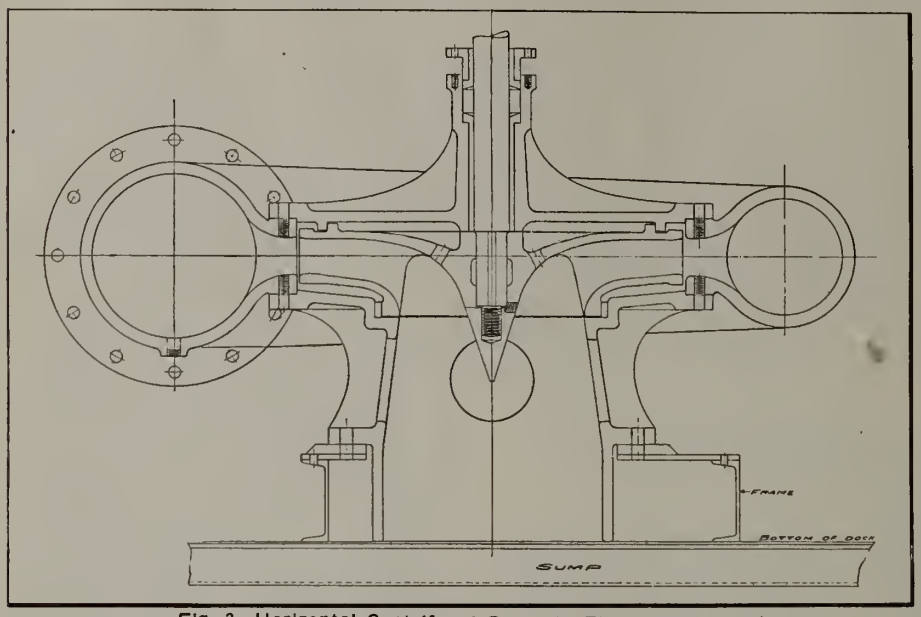


Fig. 3—Horizontal Centrifugal Pump in Floating Dry Dock.

requirements during its life, long as that may be.

The dock is very adaptable to all sizes of boats, and for boats in various conditions. For long freighters that when light have a considerable draught at the rear end, with the bow taking but a couple of feet, the dock can be immersed to suit by a proper manipulation of the valves. This is done by throttling the forward discharge valve of the dock on both sides of the dock, with the rear valves wide open, grading the intermediate valves to suit. This will give the dock bottom the correct slope to evenly catch the bottom of the boat and raise it uniformly. For smaller vessels, the dock can be divided into its two integral parts, and each used independently of the other. For very small vessels two may be docked at a time, side by side. If the two vessels be of unequal weight, the pumps on the light side may be operated at a slower speed to raise the dock evenly with the load. That is one of the advantages in having the dock divided with a longitudinal bulkhead amidships, as each side can be emptied independently.

The plans and specifications of the dock have been examined by the Chief Engineer of the Department of Public Works, and by the Resident Engineer at Toronto, and have been approved without a change.

In order to obtain a site of sufficient size on which to construct the dock, the company had to acquire two water lots to the east of the present plant. The completed dock will be located in a basin to the west of the plant on slips acquired specially for this purpose. A special plant has been obtained from Great Britain for the construction of the dock, so that the capacity of the present plant will in no wise be hampered.

A bylaw which is in course of preparation at New Westminster for submission to the ratepayers covers the building of a wharf from Tenth St. to Merrivale St. The work must be carried out by the city, after which it is expected that a harbor board will be formed to take charge of the harbor front.

Canadian Interlake Line Limited.

Reference was made in our last number to an issue of $520,000 6% 1st mortgage 15 year sinking fund bonds by this company. Following are extracts from the prospectus:—

The bonds are secured on seven vessels which an appraisal company has valued as follows:—Canadian, Acadian, McKinstry, and Renvoyle, now in service, $584,683. Indian, Hamiltonian and Calgarian, to be completed by May 1, June 1 and Oct. 1 this year respectively, $458,275. Total, $1,042,958. The fleet's total carrying capacity will be 825,000 bush.

Following is a condensed description of the vessels:—

Canadian and Acadian, sister vessels, built in 1907 and 1908 at Newcastle-on-Tyne and Glasgow, respectively. double deck, modern construction, steel, side ports, length 248 ft., beam 43 ft. Engines, Canadian, triple expansion, 19-32-52 x 36 ins.; Acadian, 18-30-50 x 36 ins.; tons burden, 3,550; carrying capacity, 120,000 bush.

A. E. McKinstry, built in 1910 at Glasgow; single deck with raised quarter deck, modern construction, steel, length 250 ft., beam 42 ft. 9 ins.; engines, triple expansion, 17-28-48 x 36; tons burden, 3,250; carrying capacity, 115,000 bush.

Renvoyle, built in 1910, at Glasgow; single deck with forecastle and raised quarter deck, modern construction, steel, length 250 ft., beam 42 ft. 7 ins.; engines, triple expansion, 17-28-46 x 33 ins.; tons burden, 3,100; carrying capacity, 100,000 bushels.

Indian, which was to be completed May 1, 1912, being built at Glasgow, double deck, modern construction, steel, side ports, length 250 ft., beam 42 ft. 6 ins.; engine, two-cycle Diesel, 4 cylinders 18½ x 32¼ ins.; tons burden, 3,650; carrying capacity, 130,000 bush.

Hamiltonian and Calgarian, sister vessels, the Hamiltonian to be completed June 1 and Calgarian Oct. 1, 1912, being built at Port Arthur, Ont.; double deck, modern construction, steel, length 250 ft., beam 42 ft. 6 ins.; engines, triple expansion, 18-29-48 x 40 ins.; tons burden, 3,550; carrying capacity, 120,000 bush.

The average net earnings since the Canadian, Acadian, McKinstry and Renvoyle have been in commission were $57,485; for 1911 they were $62,797.40. The annual net earnings for the Indian, Hamilton and Calgarian are estimated at $60,000, and the net earnings of the whole fleet in an ordinary year are estimated at $120,000.

The regular route of the vessels will be between Montreal and intermediate ports to Port Arthur, Fort William and Westfort, Ont., and as business offers they will operate to the Gulf of St. Lawrence, Georgian Bay and Lake Michigan.

The company's authorized capital is $2,000,000 half preferred 7% cumulative and half common. Of the preference stock about $420,000 has been paid up in vessel property and cash, and common stock to the same amount has been allotted as paid up for contracts and other trade connections, etc.

The board is composed as follows:—President, M. J. Haney, Toronto; Vice President, R. M. Wolvin, Winnipeg; Managing Director, J. W. Norcross, Toronto; other directors, H. Munderloh, Montreal; E. H. Ambrose, Hamilton; J. F. M. Stewart and T. Bradshaw, Toronto.

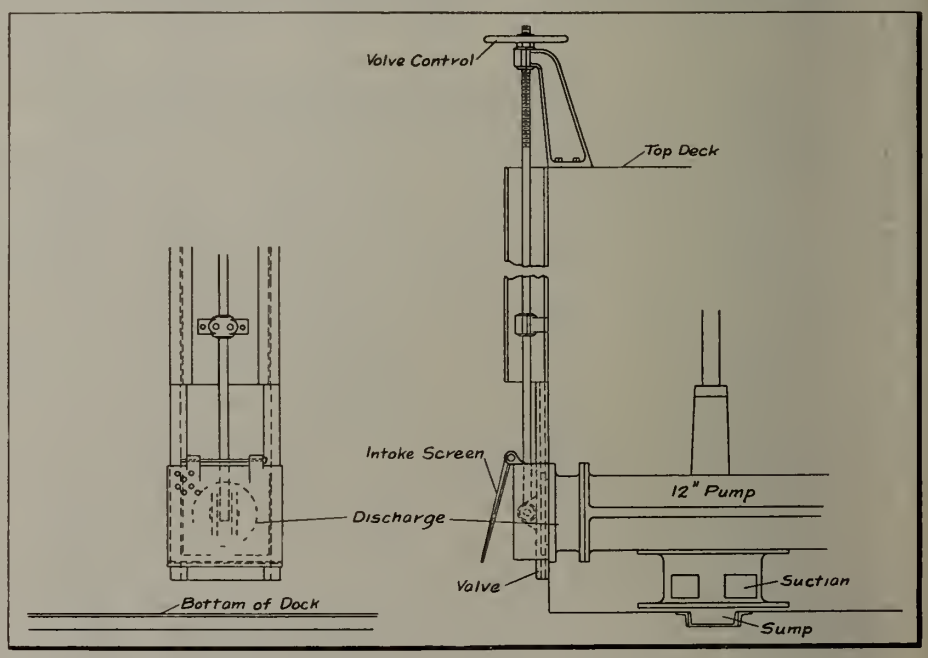


Fig. 4—Valve and Valve Control on Floating Dry Dock.

The Dominion Public Works Department is making arrangements for building a dock at Kenora at an estimated cost of $11,800.

St. Lawrence River Steamboat Co. and Thousand Islands Steamboat Co.

There are persistent rumors that these two companies which little over a year ago were acquired by a syndicate headed by Sir Edmund B. Osler, President, Niagara Navigation Co., and W. D. Matthews, President, St. Lawrence and Chicago Steam Navigation Co., and including B. W. Folger, General Manager, Niagara Navigation Co., are to be absorbed by the Richelieu and Ontario Navigation Co.

Both lines operate in connection with the New York Central and H.R. Rd. The St. Lawrence River Steamboat Co. has three boats, America, Pierrepont, and Jessie Bain, which run between Kingston, Ont., and Cape Vincent, N.Y., an important ferry service of some 20 miles, serving territory east and west of Kingston, and, on the U.S. side, Watertown, Syracuse, Utica, Rome and other important points. The Thousand Islands Steamboat Co. has three boats, St. Lawrence, Ramona and New Island Wanderer. These boats run between Clayton and Alexandria Bay, N.Y., with eight stops between, and also carry local excursions among the Thousand Islands, calling occasionally at Kingston and Gananoque, Ont. A fourth boat, the Thousand Islander, is now rapidly approaching completion.

Now that the R. and O.N. Co. has secured the Niagara Navigation Co. and as the St. Lawrence River Steamboat Co. and the Thousand Islands Steamboat Co. are operating in what may be looked on as R. and O. territory, the acquiring of the two lines which have their headquarters at Kingston, Ont., and Clayton, N.Y., respectively, might follow as a natural sequence. No official information, however, is obtainable.

Merchant Service Guild of British Columbia.

This guild, which was organized recently by captains and other officers, and which has its headquarters at Victoria, B.C., has elected the following:—

TRUSTEES: Captains B. L. Johnson, J Parkes, D. Owen.

EXECUTIVE COMMITTEE: Capts. Johnson, Shadforth, Whitley, Wearmouth, Davies, Gilchrist.

SECRETARY TREASURER: Capt. D. J. Jarvis, R.N.R.

Continuous Operation of Ontario and Quebec Canals.

In response to the Dominion Marine Association's representations, the Minister of Railways and Canals has given authority for keeping open certain canals on Sundays during the current navigation season, as follows:—The Sault Ste. Marie, Welland and Murray canals, the lift lock on the Galops canal leading into the St. Lawrence river near the head of the canal, the Williamsburg, Cornwall, Soulanges and Lachine canals will be kept open continuously during the season. The St. Ours lock, the Ottawa River canals, and the Rideau canal, will be kept open on Sundays, except between 6 a.m. and 9 p.m.

Atlantic and Pacific Ocean Marine.

The Dominion Government has granted a subsidy to Pickford and Black, Ltd., for its West Indies service, every 12 days from St. John, N.B., and Halifax, N.S.

The Eastern Asiatic Steamship Co., trading from Copenhagen and Antwerp to U.S. Pacific ports, is stated to have arranged to make calls at Victoria, B.C.

The Manchester Liners s.s. Manchester Importer touched bottom at White Island when outward bound, May 17, and returned to Quebec, and was docked at the Louise basin for examination.

J. F. Pratt, heretofore chief clerk, Canadian Northern Ry. ticket office, Winnipeg, has been appointed Travelling Passenger Agent, Allan Line Steamship Co., with territory from Port Arthur, Ont., to Moose Jaw, Sask., and with quarters at Winnipeg.

The Donaldson Line s.s. Letitia, which arrived at Montreal, May 14, on her maiden trip, from Glasgow, Scotland, has accommodation for 300 cabin and 600 third class passengers. Her dimensions are—length 470 ft., breadth 56 ft., depth 39½ ft. She made 14 knots an nour on her trial trip.

A dispatch from Japan states that the C.P.R. s.s. Empress of China, which was wrecked off the Japanese coast some time ago, is being offered for sale by the underwriters at $100,000, and that $60,000 has been offered for her by Japanese shipowners. It is stated that estimates for repairing her run from $150,000 to $200,000.

The Allan Line s.s. Scandinavian, formerly Romanic, which was bought recently from the White Star Line, arrived at Montreal, May 14, on her maiden trip to a Canadian port. Her dimensions are—length 550 ft., breadth 93 ft., depth 59 ft., registered tonnage 12,000. Her engines are of the reciprocating type, 985 n.h.p., driving twin screws.

As a result of the recent Titanic disaster, and in view of the extraordinary trend of icebergs to the south this year, the various trans-Atlantic steamship lines have decided to adopt a more southerly course for the present than has hitherto been used. On the westward route, vessels will follow latitude 38 north, and on the eastward route latitude 37.40 north, between the 45th and 50th degrees of longitude.

In response to questions in the British House of Commons recently, the President of the Board of Trade stated that the total passengers of all classes and nationalities carried outward and inward on British and foreign vessels between the United Kingdom and Canada, Newfoundland and the United States during 10 years ended Dec. 12, 1911, was 6,053,382, of which the great proportion were carried in British vessels. The number of passengers reported to the Board of Trade to have lost their lives by casualties to vessels belonging to the United Kingdom on these voyages was nine.

Maritime Provinces and Newfoundland.

The general contractors for the St. John, N.B., harbor improvements, Norton Griffiths and Co., have sublet contracts to Macdonald and Doheny, Alexandria, Ont., and C. L. Hervey, Montreal, for the construction of the breakwater, one mile long, and the removal of a large hill at the rear, involving an expenditure of $4,000,000.

The Boston and Yarmouth Steamship Co., Ltd., has been incorporated under the Dominion Companies Act, with $350,000 capital, and office at Montreal, to carry on a general steamship owning and navigation business in the Dominion and elsewhere. The incorporators are:—J. W. Brophy, F. A. Jones, Vice President, Eastern Steamship Corporation, Boston, Mass.; A. R. Holden,

List of Steam Vessels Registered in Canada during April, 1912

Name	No.	Where and When Built.	Engines, etc.	Length	Breadth	Depth	Gross Tons	Reg. Tons	Port of Registry	Owners
A. J. Wheaton	130,635	St. John, N.B., 1912	Screw 2 n.h.p.	29.2	9.5	4.9	10	7	St. John, N.B	A. J. Wheaton, St. John, N.B.
Circle B	130,858	Ehurne, B.C , 1911	" 2 "	42.0	10.4	3.7	13	9	Vancouver, B.B	D. Burns, Vancouver, B C.
D. S. Pratt	126,655	Midland, Ont., 1911	" 43 "	81.3	20.0	10.5	161	74	Midland, Ont	Canadian Dredging Co., Midland, Ont.
Dagon	130,823	Tancook, N.S., 1912	" 2 "	45.0	10.4	5.8	13	12	Lunenburg, N.S	E. Covey, M.O., Tancook, N.S.
Edrie	130,855	U.S.	" 10 "	92.3	18.0	6.8	110	75	Vancouver, B.C	British Columbia Fisheries, Ltd., Victoria, B.C.
F. H. Folsom	130,617	Portland, Ore., 1898	" 17 "	80.9	15.8	7.3	61	37	Victoria, B.C	" " "
Haysport 1	130.857	Vancouver, B.C., 1912	" 5 "	59.0	16.2	8.2	50	34	Vancouver, B.C	C. H. Leigler. Vancouver, B.C.
Lo Olbee	130.856	" 1911	" 2 "	64 0	13.0	4.6	35	24	"	R. P. McLennan, Vancouver, B.C.
Nellie J	130,711	Kenora, Ont., 1911	" 3 "	52.0	12.5	5.0	31	21	Kenora, Ont	Armstrong Trading Co., Portage la Prairie, Man.
Rupert City	93 691	Barrow, Eng., 1886	" 300 "	310.3	38.1	25.2	2898	1999	Vancouver, B.C	F. S. Watts, London, Eng.
Tsuhame	130.854	Nanaimo, B.C., 1908	" 2 "	37.0	9.8	3.4	9	6	"	C. Uchido, Vancouver, B.C.

List of Sailing Vessels and Barges Registered in Canada during April, 1912

Name	No.	Where and When Built	Rig	Length	Breadth	Depth	Reg. Tons	Port of Registry	Owners
Beaver	130,634	U.S.	Dredge	104.8	40.6	10.0	514	St. John, N.B	Beaver Dredging Co., St. John, N.B.
Elsie L. Corkum	130,827	LaHave, N.S., 1912	Schr.	101.5	26.0	10.6	97	Lunenburg, N.S	H. Corkum, M.O., LaHave, N.S.
Florence E. Getson	130,830	" 1911	"	104.8	26.2	10.2	99	"	N. Reinhardt, M.O., Lahave, N.S.
Frank J. Brinton	130,825	Mahone Bay, N.S., 1912	"	96.2	25.0	10.3	92	"	W. Gilfoy, M.O., Lunenburg, N.S.
Marion A. Silver	130,829	Lune burg, N.S., 1912	"	103.8	26.3	10.4	99	"	A. Himmelman, M.O., Rose Bay, N.S.
Matanzas	130,822	" 1912	"	106.8	26.0	10.6	96	"	N. Wentzel, *et al.*, Rose Bay, N.S.
Original	130,826	LaHave, N.S., 1912	"	104.8	26.2	10.2	98	"	R. Conrad, M.O., Rose Bay, N.S.
Phyllis L. Westhaver	130,828	Lunenburg, N.S., 1912	"	106.8	26.3	10.4	99	"	M. Rodenhiser, M.O., Lunenburg, N.S.
R. L. MacKenzie	130,506	East Jordan, N.S., 1912	"	56.8	17.6	6.9	33	Shelburne, N S	R. MacKenzie, M.O., East Jordan, N.S.
V. I. T. No. 2	130,616	Victoria, B.C., 1912	Barge	85.0	28.0	7.9	155	Victoria, B.C	Vancouver Island Towing Co., Victoria, B.C.
W. H. Smith	130,824	Mahone Bay, N.S., 1912	Schr.	103.0	25.5	10.5	94	Lunenhnrg, N.S	W. Smith, M.O., Lunenhurg, N.S.

C. G. Heward and A. E. Woodworth, Montreal.

The ratepayers of Sydney, N.S., will vote on June 3 on the proposal to grant a bonus of $1,000,000 to the British Canadian Shipbuilding Co., for the construction of a dry dock and shipbuilding plant there. It is proposed to pay the bonus in four equal instalments, the first payable on the completion of the work, and the last about 1930. The plant is to be assessed for taxes at $500,000 for 10 years, and the company will have to finance the necessary sewer and street extension up to $500,000, accepting the city's 50 year bonds in payment. Sir Henry M. Pellatt, Toronto, is interested in the company.

The Reid Newfoundland Co.'s s.s. Bruce, recently built in Great Britain, to replace the vessel of the same name, wrecked last year, is considerably larger than the older vessel, and has more power as an ice breaker. She is 1,600 tons gross and 663 tons register, and has accommodation for 70 first class and 200 second class passengers. Her dimensions are—length 250 ft., breadth 36 ft. The company will establish, June 3, a daily service between Port aux Basques and North Sydney, N.S., the steamships Bruce and Invermore leaving Port aux Basques daily except Saturdays, and North Sydney daily except Sundays. Two other steamships are under construction, one of which will replace the s.s. Invermore on the Cabot Strait, and the other will be operated in the St. John's to Labrador service.

Province of Quebec Marine.

An order in council has been passed confirming the Montreal Harbor Commissioners' amendments to bylaws regarding tariffs of grain and storage, and for handling cars.

The Sincennes McNaughton Co.'s tug Nathalie R. was launched at Sorel recently. A similar tug is under construction at Sorel for the same company, and a third is being built in Scotland. The last mentioned is to be named Aurelie G., and will cross the ocean under her own steam some time in June.

The Dominion Government ice-breaking steamboat, Bellechasse, for service in the lower St. Lawrence, was launched at Kingston, Ont., May 15. Her dimensions are, length 142 ft., breadth 27 ft., depth 13½ ft. She was christened by Mrs. E. Grimason, aged 90, who was presented with a loving cup by the builders. C. S. Duguid represented the Department of Marine, Ottawa.

The floating dry dock which is being built in England for Canadian Vickers, Ltd., and which is to be located at Maisonneuve, Montreal, is rapidly approaching completion. It will be capable of docking vessels up to 700 ft. long and 100 ft. wide, with a gross tonnage of 25,000 tons. The site for the dock is being prepared by the Montreal Harbor Commission.

The Montreal Harbor Commission announces plans for improvements to the western end of the harbor as follows:—Concrete pier 1,200 ft. long opposite the offices; removal of the entrances to the Lachine canal to west of Windmill point; construction of a concrete wharf in basin no. 1, deepening of the basin, and lengthening King Edward, Alexandra and Jacques Cartier piers by 300 ft.

The Quebec Harbor Commission, at a meeting, May 6, decided to proceed with the preparation for the construction of an elevator of 1,000,000 bush. capacity, with links so that it can be increased to 2,000,000 bush. capacity. The structure will be of concrete and steel, and arrangements were made to commence the foundation work on or about May 20. Plans for the two piers to be built in addition to the Louise embankment in line with the breakwater extension from the main pier to the centre of St. Charles River, were also discussed, and the necessary dredging was ordered to be commenced.

The shipbuilding and repairing plant which has been operated at Levis by G. T. Davie and Sons for some years has been sold to the Quebec Wrecking and Salvage Co., Ltd., in which it is said A. A. Allan, of the Allan Line, and F. L. Wanklyn, General Executive Assistant, C.P.R., are chiefly interested. The plant, which has not been successful for the past three years, received a subsidy of $10,000 a year from the Dominion Government, and on representations being made to the Government recently, it is stated that a promise was made that the amount would be increased to $25,000 annually.

Ontario and the Great Lakes.

The steamboat Turret Crown will shortly be docked at Port Arthur, where she will have two new boilers 14 ft. diar. by 11 ft. long installed.

A press report from London, Ont., states that the steamboat Forest City, which was operated last year between Port Stanley and Cleveland, Ohio, has been sold to Fort William parties.

The Western Steamship Co. has appointed R. G. Bassett, captain, and A. M. MacInnes, chief engineer, of its steamboat J. A. McKee; and G. H. Playter, captain, and J. G. McHattie, chief engineer, of its steamboat Wexford, for the current season.

The Merchants Mutual Line Steamboat A. E. Ames, in leaving Hamilton harbor, May 16, struck the G.T.R. swing bridge, causing considerable damage to the bridge and necessitating it being kept closed a short time until repairs could be executed. The vessel was not damaged and proceeded on her route.

Canadian Interlake Line, Ltd., the incorporation of which, under the Dominion Companies Act, we noticed in our last issue, has been licensed to carry on business in Ontario, provided that no larger amount of capital stock than $2,000,000 be used in the province. J. W. Norcross, Toronto, is the company's attorney.

Montreal press reports stated recently that negotiations were in progress for the Richelieu and Ontario Navigation Co. to obtain a controlling interest in the St. Lawrence and Chicago Steam Navigation Co. W. Wainwright, Vice President, R. and O.N. Co., stated, May 7, that there was nothing to be made public.

E. C. Miller, heretofore City Passenger and Ticket Agent, Northern Navigation Co., Sault Ste. Marie, Ont., has been appointed District Freight and Passenger Agent, same company, with office at Sault Ste. Marie, Ont. His territory covers North Bay to Sault Ste. Marie, Ont., including Sault Ste. Marie, Mich., Georgian Bay, Manitoulin Island and Mackinac Island.

The Belle Isle Park Co., Ltd., Ottawa, has purchased the steamboat Quinte Queen, for operation between Ottawa and Kettle Island, where the company's amusement park is situated. The Quinte Queen was built at Valleyfield, Que., in 1902, and is screw driven by engine of 13 n.h.p. Her dimensions are—length, 99.5 ft.; breadth, 20.9 ft.; depth, 4.7 ft.; tonnage, 203 gross, 143 register.

It is stated that the charges recently brought against employes of the Great Lake Towing Co., in connection with the alleged theft of cargo from the steamboat Wissahickon, which was wrecked on Duck Island in Lake Huron in Dec., 1909, for the salvage of which the company had the contract, have been dropped, and that settlement of all claims on either side has been made.

The Otonabee Navigation Co.'s steamboat Otonabee is reported to have been sold to H. D. Jamieson, Barrie, on behalf of a syndicate controlling summer hotels there. The price paid is stated as $12,000. The Otonabee was built at Peterboro in 1907, and is screw driven by engine of 21 n.h.p. Her dimensions are—length 111.2 ft., breadth 24 ft., depth 5½ ft., tonnage 136 gross, 87 register.

The arrangement for the absorption of the Niagara Navigation Co. by the Richelieu and Ontario Navigation Co., of which full particulars were given in our last issue, will be carried out, as over 93% of the N.N. Co.'s stock is reported to have already been transferred by shareholders, a number of shareholders taking cash instead of R. and O.N. Co. stock for their holdings. It is said that the long drawn out negotiations for the acquirement of the Inland Lines, Ltd., by the R. and O.N. Co. are about completed and that that deal will also go through.

Sault Ste. Marie Canals Traffic.

The following commerce passed through the Sault Ste. Marie Canals during April, 1912:

ARTICLES			CANADIAN CANAL	U. S. CANAL	TOTAL
Copper	Eastbound	Short tons	1,740		1,740
Grain	"	Bushels		1,158,299	1,158,299
Building stone	"	Short tons		32	32
Flour	"	Barrels	45,060	75,820	120,880
Iron ore	"	Short tons		32,816	32,816
Pig iron	"	"			
Lumber	"	M. ft. b.m.	277		277
Silver ore	"	Short tons			
Wheat	"	Bushels	757,842	165,628	923,470
General merchandise	"	Short tons		2,112	2,112
Passengers	"	Number	40		40
Coal, hard	Westbound	Short tons			
Coal, soft	"	"	22,400	24,379	46,779
Flour	"	Barrels			
Grain	"	Busbels			
Manufactured iron	"	Short tons		12,739	12,739
Iron ore	"	"			
Salt	"	Barrels			
General merchandise	"	Short tons	33	10,273	10,306
Passengers	"	Number	33		33
Summary.					
Vessel passages		Number	30	102	132
Registered tonnage		Net	52,955	146,974	199,929
Freight—Eastbound		Short tons	29,536	67,558	97,094
" —Westbound		"	22,433	47,391	69,824
Total freight		"	51,969	114,949	166,918

Both canals opened April 24.

The North Bay Land Co., Ltd., has been incorporated under the Ontario Companies Act, with $50,000 capital, and office at Toronto, to carry on a general land improvement business, and in connection therewith to build and operate wharves, docks, dockyards, elevators and vessels. The incorporators are:—F. H. Phippen, K.C., A. D. Davidson, A. G. McRae, W. McBain and H. Fitzsimons, Toronto, all of whom are associated with Mackenzie, Mann and Co.'s interests.

The U.S. Lake Survey reports the stages of the Great Lakes in feet above tidewater, for April, as follows:—Superior, 601.46; Michigan and Huron, 579.44; Erie, 572.25; Ontario, 246.32. Compared with the average April levels for the past ten years, Supeiror was 0.31 ft. below, Michigan and Huron 1 ft. below; Erie 0.09 ft. below, and Ontario 0.05 ft. below. It was anticipated that there would be a rise of 0.4 ft. in Lake Erie during May, and of 0.3 ft. in the other lakes.

The Minister of the Interior returned to Ottawa recently after investigating the question as to whether it would be feasible to lengthen the season of navigation. He considers that the season might be continued through December, instead of closing on Dec. 1 as hitherto, and that Thunder Bay could be kept open for navigation by means of powerful ice breakers, thus allowing about 20,000,000 bush. of grain to be shipped that would otherwise have to be stored at Fort William and Port Arthur for the winter.

F. Mitchell, heretofore land steward, Northern Navigation Co., Collingwood, has been appointed Chief of Commissary, with full charge of the cabin departments on all the company's vessels and the land stewards' offices at Collingwood and Sarnia; also the operation of, and the linen at, the company's laundry at Sault Ste. Marie, Ont. His office is at Collingwood. The accounts and records of the laundry will be handled by E. C. Miller, City Passenger and Ticket Agent, Sault Ste. Marie, who will receive instructions from the audit office.

F. H. Clergue, who is interested in the proposal to build a dry dock and ship building plant at Sault Ste. Marie, Ont., is reported to have stated there, May 14, that his company would spend about $1,500,000 on the work, developing a plant large enough to employ 1,000 men. During the first years of the operation of the plant, the construction of two vessels would be undertaken, and later the capacity would be increased to six vessels each year would be undertaken, and later the capacity would be increased to six vessels a year. The plans had been deposited with the Public Works Department, and as soon as they were passed, the project would be proceeded with.

The Toiler, which was brought from England last year, and which is equipped with internal combustion engines, of which we have already given full descriptions, has been sold to a syndicate, in which Jas. Playfair of Midland, H. W. Richardson of Kingston, and H. H. Gildersleeve of Sarnia are principally interested. She will be operated under the management of J. Richardson and Sons, Kingston, trading almost exclusively between Montreal and Port Colborne, and possibly to Lake Erie ports for coal. It is not likely that she will be operated to Fort William this season. She was reported aground in a dangerous position near Cardinal, May 24.

The works which, it is stated, will be undertaken for the improvement of Hamilton harbor during the current season include the continuation of the revetment wall for 466 ft., in line with the east side of Wellington St. produced; the construction of close sheet piling with concrete superstructure to connect the revetment wall with the shore of Wellington St., and filling in at back of same; extensions of existing channels, and the construction of a wharf, 450 by 50 ft. The Dominion Parliament has voted $200,000 on account of the work, and plans have been prepared and filed with the Department of Public Works, together with a report by J. G. Sing, Government Engineer.

The St. Lawrence and Chicago Steam Navigation Co. is having a vessel built at Collingwood for delivery in 1913 season. The dimensions are—length, 550 ft.; breadth, 58 ft.; depth, moulded, 31 ft. She is to be built on the arch web system of framing, and fitted with side tanks and water bottom for the whole length, and there will be 32 hatches with sliding doors. The machinery will consist of vertical triple expansion engines with cylinders 24, 40 and 66 ins. diar., by 42 ins. stroke, supplied with steam at 185 lbs. by three Scotch boilers equipped with forced draught. She will be built to the highest classification of the Great Lakes Register, and is estimated to cost $375,000.

The Northern Navigation Co. has contracted with the Marconi Wireless Telegraph Co. of Canada for the equipping of its steamboats Hamonic, Huronic and Saronic, with wireless telegraph installation, and it is expected that the installations will be completed before the heavy passenger season commences. The Dominion Government has erected wireless telegraph stations at Tobermory, Midland and Sault Ste. Marie, all of which, it was stated, would be equipped by June 1. A station is also to be erected at Sarnia, and it is expected to be ready for operation by the end of August. We are informed that the Marconi Company will operate all the stations under contract with the Dominion Government.

C. P. Edwards, of the Dominion Government Radio Telegraph Service, is reported to have stated recently that in the near future the Government would establish a series of wireless telegraph stations, extending from the head of the lakes to Belle Isle, Que., or Cape Race. The stations would probably be built at distances of about 180 miles, between Port Arthur and Kingston, Ont., where a powerful station would be erected to communicate with Montreal. Stations are already practically complete at Port Arthur, Sault Ste. Marie, Tobermory and Midland, Ont., and other stations will be completed very shortly, covering the north shore and Georgian Bay. It is also stated that stations will be erected at Point Edward, Port Stanley and Port Colborne, Ont.

The Peoples Steamboat Co., Ltd., has been incorporated under the Ontario Companies Act, with a capital of $150,000, and office at Toronto, to take over the business of the Argyle Steamship Co., Ltd., and the steamboat Argyle, which was formerly operated between Toronto and Olcot Beach, N.Y. The Argyle was built at Picton, Ont., in 1899, and is a paddle wheel steamer, with engine of 274 n.h.p. Her dimensions are—length. 185.1 ft.; breadth, 26 ft.; depth, 9.7 ft.; tonnage, 700 gross, 374 register. It is the intention to run her this season between Toronto and Lewiston, N.Y., twice daily, commencing towards the end of June, and to purchase another vessel to take up the passenger business, leaving the Argyle for freight business. The officers of the company are:—President, F. Denton, Toronto; Vice President, C. W. Perkins; Managing Director, H. W. Crawford, Toronto; other director, J. J. Doyle, Niagara-on-the-Lake, Ont.

Manitoba, Saskatchewan and Alberta.

Navigation opened on the Athabasca River, May 6, when the Hudson Bay Co. sent its first vessels down the river from Athabasca Landing. Vessels are also running up the river as far as Little Slave Lake.

The Saskatchewan Navigation and Recreation Co. is in process of organization, for providing summer resorts, and owning and operating motor driven and other vessels in connection therewith. The capital stock is $10,000, and the head office is at Saskatoon, Sask.

The Public Works Department has recommenced survey work on the North Saskatchewan River in connection with the proposal to make the river navigable. The work is in charge of L. R. Voligny, and two parties are working from Edmonton, Alta., under G. P. Morse and H. H. Smith.

The Public Works Department has awarded the contract for the erection of a bascule lift span bridge for the St. Andrews lock, on the Red River below Winnipeg, to the Brown Construction Co., Ltd., Winnipeg. The whole work must be completed within 15 months, the contract price being about $150,000.

The U.S. Government will spend $17,000 on a survey of the Red River, from Breckenridge, Minn., and Wahpeton, N.D., to the International boundary, to determine the practicability of establishing a series of locks and dams. The scheme is being supported by the Red River and Hudson Bay Navigation Association, recently formed in Grand Forks, N.D., and in which a number of Manitoba men are interested.

British Columbia and Pacific Coast Marine.

The C.P.R. commenced its new service between Victoria, B.C., and Tacoma, Wash., May 15, with the s.s. Iroquois. The service is a daily one, and the vessel will call at Seattle each way.

A bill was recently introduced in the U.S. Congress providing that no passengers shall be carried by water between any other port in the U.S., and any port in Alaska, either directly or by a foreign port, except in U.S. vessels.

The Union Steamship Co. is suing J. H. Welsford, Liverpool, Eng., for the final payment of the purchase price of the company's undertaking, and an application has been made for an accounting. It is stated that the completion of the purchase is not in any way affected by the case.

A dispatch from London, Eng., states that C. F. Pretty, of Vancouver, has arranged with English capitalists to confer with the Dominion Government with a view to taking up the proposed bond issue of the Vancouver Dock and Harbor Development Co., which has planned a large harbor and dock scheme on Lulu Island.

Work on the vessel which the C.P.R. is having built at Esquimalt was commenced during May. A large quantity of the material to be used in construction has been brought from Great Britain, and it is said that the engines will be built there. This vessel will be the largest steel steamer and the third of the C.P.R. coast service to be built in British Columbia.

The Union Steamship Co.'s s.s. Chelohsin, which recently struck a rock in the Skeena river, was docked at Vancouver, May 3, for examination and repairs. It was discovered that about 100 frames would have to be straightened and a number of plates renewed, at an approximate cost of $25.000. The Chelohsin only arrived on the coast in February, from Ireland, where she was built.

The G.T. Pacific Coast Steamship Co. has decided to equip its steamships Prince Albert and Prince John with oil burning apparatus, similar to that installed on its steamships Prince Rupert and Prince George, and which was fully described in our March issue. It is possible this change may not be made until the fall, as it may not be convenient to take the vessels out of service until then.

The C.P.R. s.s. Princess Sophia, which recently arrived at Vancouver from Scotland, has been placed on her route between Vancouver, Prince Rupert and Queen Charlotte Island ports. She is a single screw vessel, with triple expansion engines, having a speed of 13 knots an hour, and has been so equipped that he may use either coal or crude oil as fuel. Her dimensions are—length 247 ft., breadth 44 ft., depth 18 ft.

The G.T. Pacific Coast Steamship Co. has made a number of changes in the officers of its vessels. D. MacKenzie, captain of the Prince Albert, has been transferred to Prince George, vice F. T. Saunders, appointed agent of the Department of Marine at Prince Rupert; D. Donald, captain of the Henriette, has been transferred to the Prince Albert; D. O'Brien, heretofore on the Prince George, has been appointed captain of the Henriette.

The Department of Marine has erected two echo boards on the bank that dries on the north shore of the first narrows of Burrard Inlet, to assist in guiding vessels through the narrows in foggy weather, by reflecting echoes of their whistles. One of the boards is located at the west entrance, 3-10 mile north from the lookout on Prospect Bluff, and the other is at the east entrance of the narrows, entrance to Vancouver harbor, ½ mile 351 deg. from Brockton Point lighthouse. Each is painted white.

It is reported in Victoria that a company is being formed by a number of U.S. capitalists for the purpose of operating a line of steamships along the Pacific coast, between U.S. and Canadian ports. It is stated that the intention is to commence the service with three vessels, and that orders for construction will shortly be placed. Docking facilities are being arranged for at Victoria, Vancouver and other points in British Columbia. C. W. Clark, who has been connected with the Guggenheim interests for several years, is reported to be chiefly interested in the project.

It was reported in Vancouver, May 2, that E. L. Kinman, who, with his associates, is interested in the proposal to build dockage facilities at Deadman's and Co.. Ltd., Vancouver, to prepare plans and estimates for the construction Island, had requested Norton Griffiths of a concrete dock with six piers each 1,400 ft. long, with structural steel warehouses and car tracks, and a bridge to connect with the mainland, the dock to provide accommodation for about 28 vessels. F. W. Nicholson, local manager, Norton Griffiths and Co., is reported to have stated that the company had been asked to prepare designs and estimates, but had since been asked to suspend operations on account of possible alterations.

The Dominion Government steamboat Estevan, which is intended for the lighthouse and buoy service on the Pacific coast, was launched at Collingwood, Ont., recently. She is built of steel throughout with double bottom running the entire length. Her dimensions are —length 212 ft. over all, breadth 38 ft., depth, moulded, to main deck 17½ ft. She has a deadweight capacity of 375 tons on a mean load draught of 11½ ft., with bunker capacity for 260 tons, and has a speed of 12 knots an hour. She is built with a straight stem and elliptical stern, with seven watertight bulkheads, and is equipped with two sets of inverted vertical direct acting triple expansion surface condensing engines with cylinders 15, 25 and 42 ins. diar., by 26 ins. stroke, supplied with steam by two Scotch boilers, 10½ by 14 ft. diar., at 180 lbs. pressure, and with all the necessary pumps for condensing, fire purposes, etc.

The Minister of Trade and Commerce has addressed a communication to the Vancouver board of trade in connection with the numerous petitions the department has received from municipalities, etc., for the construction of elevators and other grain shipping facilities at British Columbia ports. The points on which he desires information are, the extent of wheat exportation through Vancouver during the past two or three years, the countries to which it has been shipped, and whether in bag or bulk; the grounds on which a suggested increase is based, and upon what calculation of rates and transport facilities is the opinion based that when the Panama canal is opened, grain from the prairie provinces will seek the western route to Europe in competition with existing routes, and what points in the province would be considered available and necessary for establishing elevator facilities. The board of trade has formed a special committee to gather information.

St. John Harbor Improvements.

The general contractors, Norton Griffiths and Co., Ltd., have awarded the contract for the quarrying of the rock from the large hill recently acquired for quarry purposes, and on which the site of the dry dock will probably be situated, to Doheny and Macdonald, Alexandria, Ont., and C. L. Hervey, Montreal. In addition to the quarrying of the stone, the subcontractors will have to haul it to the site of the breakwater, and form the breakwater itself, the subcontract calling for the construction of a large portion of the breakwater.

The breakwater at the sea end is to be built in cribwork, but the method of dealing with this portion of the work has not been decided on.

The general contractors are carefully considering the material to be dealt with in the bay, in connection with the dredging to be undertaken, with a view to designing the most up to date dredging plant it is possible to build. The exact type of dredges to be used will probably be decided shortly. The dredging contract calls for an average output of 15,000 cu. yds. in each 24 hours.

Vessels Removed from the Register.

The following vessels were removed from the Canadian register during April, for the reasons assigned:—Steam—Annie Blanche, Parrsboro, N.S., 68 tons, sunk; Bridgetown, Chatham, N.B., 10 tons, broken up; Enterprise, Halifax, N.S., 14 tons, broken up; Georgia, Windsor, Ont., 19 tons, out of existence; Olive, Victoria B.C., 4 tons, broken up. Sailing—Alexander, St. Catharines, Ont., 351 tons, lost; Archie, St. Catharines, Ont., 172 tons, lost; Emerald, St. Catharines, Ont., 322 tons, lost; Florence M. Smith, Sydney, N.S., 99 tons, lost; Hibernia, Maitland, N.S., 298 tons, abandoned at sea; Malta, St. Catharines, Ont., 198 tons, lost; Mary Ellen, Port Hope, Ont., 51 tons out of existence; Pride of America, St. Catharines, Ont., 285 tons, lost; Sylvestor Neelon, St. Catharines, Ont., 291 tons, lost.

The Marine Directory of the Great Lakes for the current year, published at $3 by Mitchell & Co., Cleveland, Ohio, has been issued. It contains information regarding the construction of United States and Canadian vessels, names and addreses of owners, lists of steamship owners, information concerning grain elevators, coal docks, and a great deal of miscellaneous matter.

A conciliation board has been appointed to enquire into the request of the employes of the Canadian Northern Coal and Ore Dock Co., a subsidiary of the Canadian Northern Ry., Port Arthur, Ont., that the same wages be paid them as to C.P.R. employes for similar work.

At the International Congress of Navigation at Philadelphia, Pa., which opened May 23, Canada was represented by Col. W. P. Anderson, Chief Engineer, Department of Marine; John Kennedy, Consulting Engineer, and F. W. Cowie, Chief Engineer, Montreal Harbor Commission, and J. F. Armstrong, of Fredericton, N.B. On the rising of the congress, a party of about 150 will travel the Canadian waterways from Sault Ste. Marie to Quebec, as guests of the Dominion Government.

New Steamship for Hydrographic Service for the Atlantic Coast.

TENDERS are invited and will be received by the undersigned at the office of the Department of the Naval Service, Ottawa, and the office of the High Commissioner, London, Eng., for the design and construction of the above vessel up to noon, June 30th, 1912. Designs and specifications for the above ship, for the information of prospective tenderers, may be obtained on application to the undersigned, or to the office of the High Commissioner for Canada, London. The vessel is to be delivered free of all charges to H.M.C. Dockyard, Halifax, N.S. The time of delivery to be in accordance with that established in the specifications, viz., within twelve months of the date on which the contract is awarded. The Department does not bind itself to accept the lowest or any tender, the awarding of the contract will depend upon the ability of the tenderer to execute the contract, as well as a consideration of the tendered price. A certified cheque payable to the Deputy Minister of the Naval Service, amounting to Ten Thousand Dollars ($10,000) must accompany tender, as a guarantee that the contract will be undertaken if awarded.

G. J. DESBARATS,
Deputy Minister of the Naval Service.
Department of the Naval Service.
Ottawa, Ont., May 11th, 1912.

Lake Grain Shipments.

The following statement prepared by F. Symes, Acting Grain Inspector, Fort William, Ont., shows the bushels of grain shipped by vessels from Fort William and Port Arthur, Ont., from the opening of navigation, April 24 to May 7. The figures in each column, after the period, represent lbs.

1912	Wheat	Oats	Barley	Flax
Canadian Ports				
Goderich	201,780.40	157,804.14		
Midland	456,354.30	219,000.00		
Montreal	1,853,457.00	239,686.28	22,203.16	55,758.36
Port Colborne	588,443.10			
Port McNicol	62,891.30			
Tiffin	702,917.50			
	3,865,844.50	616,491.03	22,303.16	55,758.36
Foreign Ports				
Buffalo	5,855,493.20			293,768.10
Erie	554,778.40			
Port Huron	326,744.10			
	10,602,861.00	616,491.08	22,303.16	349,526.46

Tides on the British Columbia Coast.

In the investigations of the tides by the Naval Service Department's tide and current survey branch the future development of British Columbia is kept in view, and data are already given for the tides at Alberni, Port Hardy, Kitimat, Bella Coola and other places which may quite possibly become railway terminals in the near future. Not only is the direct interest of navigation benefited by the information published, but several important industries that are dependent on water transport, notably the lumber industry and the coal trade, which carry on their business by towing to so large an extent. Vancouver Island may be considered as an immense natural breakwater against the heavy seas of the Pacific, enclosing between itself and the mainland a series of sheltered passages and channels, which form a network of natural canals probably unrivalled anywhere in the world. This system of water communication is one of the assets of British Columbia which may not be appreciated at its full value, but this is emphasized by the constant use of these Canadian channels by United States vessels on the route from Puget Sound to Alaska.

The only difficulty in their navigation arises from the strong tidal currents met with in the various narrows, so strong that in some of them navigation is only possible at slack water. This problem the tidal survey undertook to solve and the practical outcome now obtained places navigation of all grades under a debt of obligation for its persevering efforts. The most important of these passes is the notorious Seymour Narrows, and it will interest mariners to learn in what way it is now possible to calculate correct tables for slack water there.

Observations at Seymour Narrows were obtained as long ago as 1897 by the U.S. Coast and Geodetic Survey. As a rule, the turn of a tidal current has some definite relation to the time of high and low water in the locality, but these observations showed at once that in this case no such relation could be found. The Coast Survey also failed to establish a relation with their tidal stations in Puget Sound and Alaska, because the tides there are of a different type. The Dominion Tidal Survey undertook this problem with better hope of success, as it has well-established tidal stations in British Columbia, with which to compare the complicated behavior of the currents in Seymour Narrows.

After a lengthy research the discovery was made that the turn of the current was governed by the rise and fall in the open Pacific, and now that this is known it seems quite natural because the Pacific tide comes round both ends of Vancouver Island from the north and south. The best tidal station on the open Pacific with which to make comparison was Port Simpson.

Having thus got within sight of a solution further observations were obtained in 1910. Although there is so heavy a traffic through Seymour Narrows, the shores are uninhabited, and observers for these narrows and the Yuculta were supplied with an outfit for camping at commanding points and chronometers for accurate time. In reducing both the old and new observations, tide tables were first calculated for the back year of 1897 at Port Simpson, and the observations of 1910 were compared with the simultaneous tides there. In making the comparisons between the time of slack water and the tide, it was found necessary to distinguish the half tides from the others, but even then the results were not altogether satisfactory till a fresh discovery was made. The difference in time with the tide at Port Simpson was reasonably constant for high water slack, but for low water the difference had to be taken with the next following tide there. This curious result is in accord with the difference in the time of the tide to the north and south of the narrows, as the difference is practically the tidal period of six hours. The data thus obtained, with a special allowance for the half tides, at last afford a satisfactory basis for the calculation of slack water, as now published in the tide tables.

This achievement has made it possible to give data for all the passes and rapids which lie along an irregular line from Seymour Narrows eastward to the mainland at the mouth of Bute Inlet. The extreme pass on that side is the Yuculta, and it was therefore chosen as the companion to Seymour Narrows in the simultaneous observations of 1910. With the two extremes, next Vancouver Island and next the mainland, it became possible to deduce data for all the intermediate passes. For the time of slack water in these, in relation to the principal narrows, is known to many of the captains of the tugs and coasting steamers who use them, and this information has now been brought into practical shape, and is published this year for the first time in the tide tables.

A knowledge of the time of slack water in such narrows as Okisollo, Wellbore, Green Point rapids and others, is of substantial value to the lumber industry especially, as the most powerful tugs with a tow of logs can only attempt such places at slack water. These passes are in frequent use also by coasting steamers for a rapidly increasing traffic.

These additions in the new tide tables make them very complete, as slack water tables are already published for Active Pass, Porlier Pass and First Narrows, on the routes from Victoria and Nanaimo to the mainland, and the tides at the most important harbors in the province are fully given. It is to be hoped that all mariners will take advantage of these, as they are quite superior in accuracy to anything heretofore available.

Canadian Notices to Mariners.

The Department of Marine has issued the following:—

23. Apr. 24. 62. Quebec, Gulf of St. Lawrence, Gaspe Bay, Gaspe basin, buoys discontinued. 63. Quebec, River St. Lawrence, Cap Brule, main light to be moved to the front range lighthouse.

24. Apr. 25. 64. Ontario, Lake Erie, Port Colborne, light on eastern breakwater temporarily discontinued.

25. Apr. 25. 65. New Brunswick, Bay of Fundy, Machias, Seal island, westerly light permanently discontinued. 66. New Brunswick, St. Croix river, buoy established east of Docket island. 67. New Brunswick, south coast, Bay of Fundy, off Negro head, submarine bells not in operation. 68. Nova Scotia, south coast, Green bay, Green ledge, bell buoy established. 69. Nova Scotia, Cape Breton island, Lennox passage, buoy established east of Dog island. 70. Nova Scotia, Cape Breton island, east coast, Glace Bay, Glace cove, change in position of storm signal mast.

26. Apr. 27. 72. Prince Edward Island, Northumberland strait. West point wharf, range lights established. 73. Quebec, Gulf of St. Lawrence, Little Natashkwan harbor, uncharted reef, buoy established, wharf built.

27. Apr. 30. 74. British Columbia, Strait of Georgia, Burrard inlet, Atkinson point, new lighthouse and fog alarm under construction. 75. British Columbia, Burrard inlet, First narrows, echo boards established. 76. British Columbia, Dixon entrance, non-existence of reported shoal.

28. May 7. 77. British Columbia, Strait of Georgia, sandheads of Fraser river, advertised change in positions of gas and whistling buoy and lightship, not made.

29. May 8. 78. Ontario, River St. Lawrence, Lake St. Francis, Lancaster light station, hand fog horn discontinued. 79. Ontario, St. Clair river, Sarnia, barge established to mark wreck. 80. Ontario, Lake Huron, north channel, Manitoulin island, Little Current, description of dredged channel. 81. United States of America, Detroit river, changes in Grosse Isle south channel range lights. 82. United States of America, Detroit river, change in Ecorse back range light.

30. May 10. 83. Nova Scotia, Cape Breton island, east coast, Scatari island, Mainadieu, intended change in character of light. 84. Quebec, entrance to the St. Lawrence, survey steamer, engaged in the investigation of currents, to be avoided. 85. Quebec, Saguenay river, change in position of buoy above Riviere Lachance.

31. May 11. 86. British Columbia, William Head, Alberni, and Prince Rupert, quarantine regulations.

32. May 14. 87. Gulf of St. Lawrence and Atlantic coast, corrections to telegraph chart in reference to ocean cables. 88. Nova Scotia, south coast, Cross island, intended change in character of light. 89. Quebec, River St. Lawrence, ship channel between Quebec and Montreal, Lake St. Peter, gas buoy at no. 3 curve, change in color of light.

33. May 15. 90. Ontario, Lake Ontario, South Bay point, light again in operation. 91. Ontario, Lake Huron, Port Elgin, change in position of front light of south range, daymarks established.

34. May 18. 92. Ontario, St. Clair River, Sarnia, wreck of steamer Joliet being removed, caution.

35. May 18. 93. Nova Scotia, south coast, entrance to Halifax harbor, Sambro outer bank, lightship removed, gas and whistling buoy replaced in position.

The Heathcote-Malmstad Collision.

Following is a summary of the judgment delivered Apr. 26 by L. A. Demers Wreck Commissioner, and concurred in by Capt. R. MacDonald, North Sydney, N.S., and Capt. N. H. Townsend, Port Warden, of Sydney N.S., re the collision between the s.s. Heathcote, owned by the Dominion Coal Co., and the s.s. Malmstad, under charter to the same company, in Louisburg harbor, N.S., Mar. 20.

The court finds that the Malmstad occupied what is considered the proper anchorage, and that its position did not obstruct the range lights which serve as a guide for the passage between White rock and Battery shoal. A proper watch was kept and the regulation lights were burning, and when the collision seemed imminent, chain was promptly paid out, this being the only practical alternative for the anchored vessel. Regarding the Heathcote, it is evident that with an extremely limited draught forward, she was carried rapidly to leeward by the prevailing winds, and insufficient allowance was made therefor, and the court holds that the master of the Heathcote acted imprudently and showed lack of judgment in navigating his vessel as he did under the conditions existing. All examinations of the Heathcote's logs disclose their incompleteness in recording the details of the circumstances preceding and attending the collision. In view of the facts, the court exonerates the master and officers of the Malmstad from responsibility for the collision and finds that Capt. Alex. Muir of the s.s. Heathcote committed a grave error of judgment in attempting to cross the bow of the Malmstad in the manner he did, for which he is severely censured and cautioned to exercise more prudence and discretion in future.

New Steamboat for C.P.R. Kootenay Lakes Service.

The C.P.R. recently awarded a contract for the construction of a vessel for its Kootenay Lakes service, to the Western Dry Dock and Shipbuilding Co., Port Arthur, Ont. The chief dimensions will be as follows: Length between perpendiculars, 200 ft.; beam moulded, 40 ft.; beam over guards, 43 ft.; depth, 8 ft. The hull will be of steel, with wrought iron stem, square stern with two longitudinal water tight bulkheads. one longitudinal truss and seven transverse bulkheads. Three steel interchangeable rudders will be fitted in place, and one spare one will be supplied. The deck will be of ¼-in. plate throughout, all flush rivetted, ¼-in. straps, all longitudinal seams single rivetted and transverse seams double rivetted. There will be openings from the deck to each compartment, with light plate door flush with deck. The stem will be of wrought iron 1¾ by 7 ins., to extend 18 ins. above the main deck. The transverse bulkheads will be ¼-in. thick with single 3 by 3 by ⅜ ins. angle frames, stiffeners flanged 2½ ins., spaced 3 ft. vertically, and one 3½ by 2½ by ¼ ins. horizontal plating. The longitudinal bulkheads will be of ¼-in. plates attached to shell plate and deck by 2½ by 2½ by ¼ ins. angles, angle stiffeners 3 by 3 by ⅜ ins., spaced 3½ ft. apart under hog posts. The engines will be of the tandem compound type with cylinders 16¾ and 35⅜ ins. diar., by 96 ins. stroke. Centre to centre of engines to be 25 ft. 8¼ ins., and they will be of ample strength for a working steam pressure of 200 lbs.

Stranding of the s. s. Earl Grey.

Following is a summary of the judgment delivered by L. A. Demers, Wreck Commissioner, concurred in by W. R. Lugar, Examiner of Masters and Mates, Halifax, N.S., and Capt. W. McKenzie, Pictou, N.S., Apr. 23, re the stranding of the Dominion Government s.s. Earl Grey at the River John in the Northumberland Straits, Apr. 17.

The court finds that Capt. Angus Brown was unable accurately to determine the speed of his ship, as the day of the stranding was the first occasion that she had been navigated in clear water, following the loss of her propeller blades, and that realizing the unreliability of his calculation with regard to the speed he should have adopted all available methods of establishing his position. His action in proceeding at full speed in a dense fog, without sounding, despite the fact that the vessel was equipped with a machine capable of determining the depth of water while proceeding at full speed, as well as his failure in insisting that a lookout be kept on the forecastle head, constitute, in the opinion of the court, grave errors of judgment. Further, it is held, that instead of relying almost entirely on assistance from other sources, he should have utilized the wire remaining unused in his hold, to lay a bower anchor, and in the event of the wire not being of sufficient strength to dislodge the vessel, it would have acted as a deterrent against the vessel being driven ashore by strong gales. The reason given by the captain for the non-usage of the wire, to the effect that the chain attached to it, combined wih its own weight, could not be sustained by the boats, cannot be accepted, for the mate in his evidence stated that he had procured spars from which to suspend the anchor between the boats to be utilized in hauling the vessel off. The captain's statement that he issued verbal orders for the speed to be reduced prior to the stranding remains uncorroborated, and the mode of procedure which he claims to have followed cannot be countenanced. The court therefore suspends the captain's certificate for three months from Apr. 22. The court also holds that the pilot, McGregor Fraser, whose license extends from Pictou to Prim Point, was guilty of negligence through his failure to exercise necessary precautions with regard to the navigation of the vessel, and a copy of the finding will be forwarded to the Pictou Pilot Commissioners in order that they may deal with him. The second officer, F. P. Gallant, is considered to be insufficiently experienced in steamship navigation to occupy such a responsible position.

Lake Vessel Insurance Rates.

Largely owing to the Canadian Lake Protective Association's very successful work last season insurance rates on the Great Lakes and contiguous waters have been materially reduced this year directly in the premium charged and indirectly by the lowering of the valuation at which ships will be insured.

As a result of conferences between the Association's representatives and the underwriters the values have been reduced from £11 or $53.50 a ton to £10 1s 2d or $51 a ton. Last year the Great Lakes Protective Association, a United States organization, had a rate of 5½% with U.S. insurance companies, while the Canadian owners were charged 5¾% in the U.S. against 5½% by British companies. This year a list of preferred fleets will get a 5¼% rate pro rata. On all vessels attaching on and after Aug. 1 ¼% will be added, and to those attaching on and after Oct. 1 ½% will be added.

An agreed policy will be used as in previous years. The Association and the London underwriters will consult and agree as to form of protection and indemnity clause, in view of recent workmen's compensation acts.

Declaration as to Vessel Ownership.

The British Colonial Secretary has forwarded to the Governor General a copy of a letter issued by the Board of Trade on the subject of the alteration of the form of declaration of ownership required by sec. 9 of the Merchant Shipping Act, 1894, to be made on application for registry of a vessel owned by a body corporate, and requesting to know whether it would not be desirable to bring the new forms into use in Canada. The letter referred to reads:—

". . . It will be seen that the principal alteration consists in the insertion of a paragraph to the effect that the company on whose behalf the declaration is made 'has its principal place of business at —— where all the important business of the company is, in fact, controlled and managed at meetings of directors of the managers of the company.' Recent experience has shown that foreign shipowners who are desirous of obtaining the advantage of the British flag for their vessels without relinquishing their control of them, sometimes attempt to effect their object by registering a company under the British Companies Act and having merely a registered office in the United Kingdom without in fact transacting their business there; and the object of the alteration in the form is to check as far as possible the registration of vessels owned by such companies."

The Inland Lines steamboat Empress of Midland, while running light from Midland to Cleveland, May 5, ran aground at Cabots Head during a fog and was released, May 7, and taken to Collingwood, where she was docked for repairs to about 20 plates.

Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time, we wish our readers to distinctly understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

The Preston Car and Coach Co., Ltd., Preston, Ont., has been granted supplementary letters patent, increasing its capital stock from $200,000 to $500,000.

McKeen Motor Car Co., Omaha, Nebraska, has opened a central sales district office at 1451 Marquette Building, Chicago, Ill., with E. E. Wright as manager.

The Brown Hoisting Machinery Co.'s catalogue J 1912, covers illustrated descriptions of various kinds of hoisting and conveying machinery, including the Brown-hoist pillar crane, hand wrecking crane, mast jib crane, bracket jib crane, pillar jib crane, stationary bridge crane and transfer table. The illustrations include a two ton Brownhoist hand pillar crane, with 15 ft. radius, erected on a car for street railway work, for the Ottawa Electric Ry., a description of which is given in the Electric Railway Department of this issue.

The Robb-Brady Scotch boiler, which is manufactured at Amherst, N.S., and South Farmingham, Mass., was tested recently at the sewerage pumping station, Farmingham, Mass. This boiler is a modified form of the standard Scotch marine boiler, it being claimed that the changes from the standard form greatly increase the circulation. The heating surfaces are arranged as in the standard form and there are the same internal furnace flues, but there are two smaller shells, one above the other, in place of the large one, and an annular circulating passage is formed at the front end by the use of a plate beneath the front neck. This plate guides the cooler feed water around the shell, discharging it beneath the furnaces at the front. The water is heated while passing around the furnaces and among the tubes, and enters the steam drum by the rear neck. In the test referred to the boiler was equipped with thermometer oil wells so that the temperature could be noted at four points, viz., at the top of the shell near the front end, at the top of the shell at the rear just over the combustion chamber, at the front and rear close to the bottom. We are advised that with water in the boiler at about 80° the fires were started and readings of every thermometer taken every five minutes. The temperature of the water at the top of the shell increased steadily until the boiling point was reached. At the bottom the temperatures increased very slowly up to the time the upper thermometer indicated the boiling point. Then the lower thermometer showed sudden rise, jumping to within a few degrees of those at the top. From this time on all four kept within a few degrees until 100 lbs. was reached, at which time practically no difference could be noted at the four points, showing that the circulation was positive and rapid.

Railway Lands Patented. — Letters patent were issued during March, covering railway lands in Manitoba, Saskatchewan, Alberta and British Columbia, as follows:—

	Acres.
Canadian Northern Ry.	6.39
Canadian Pacific Ry.	1,352.938
Grand Trunk Pacific Ry.	20.43
Total	1,379.758

ONTARIO—ST. LAWRENCE CANALS.
MURRAY CANAL.

SEALED TENDERS addressed to the undersigned, and endorsed "Tender for Dredging Murray Canal," will be received at this office until 16 o'clock on Wednesday, June 5th.

The specification and form of contract to be entered into can be seen on and after Monday, May 20th, at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, and at the office of the Resident Engineer of the Ontario-St. Lawrence Canals, Cornwall, at which places form of tender may be obtained.

Parties tendering will be required to accept the fair wages schedule prepared or to be prepared by the Department of Labor, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $900.00 made payable to the order of the Minister of Railways and Canals must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work at the rates stated in the offer submitted.

The cheque thus sent in will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security, for the due fulfilment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,

L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, May 18th, 1912.

Newspapers inserting this advertisement without authority from the Department will not be paid for it.—23205.

Department of Railways and Canals.

New Fishery Protection Vessel for Service on Pacific Coast.

TENDERS are invited and will be received by the undersigned for the design and construction of the above vessel up to noon 17th June, 1912.

General particulars and a guidance print shewing the typical nature of the vessel required, for information in preparing a design, may also be obtained on application to the undersigned.

The vessel is to be delivered free of all charges at H.M.C. Dockyard, Esquimalt, the time of delivery to be stated in the tenders. Special consideration will be given to early delivery.

An alternative tender may be submitted if so desired, using Diesel Heavy Oil Engines as the motive power for propulsion, but such engines would be required of the 2 cycle reversible type, designed to use Texas and other heavy oils.

The Department does not bind itself to accept the lowest or any tender, the awarding of the contract will depend on the suitability of the design for the service required as well as a consideration of the tender price.

The tenderer should also state for what price two vessels of the type proposed will be supplied.

A certified cheque payable to the Deputy Minister of the Naval Service, amounting to $10,000, must accompany design and tender, as a guarantee that the contract will be undertaken if awarded. If two vessels are decided on a further deposit of $10,000 will be required.

G. J. DESBARATS,
Deputy Minister of the Naval Service.

Department of the Naval Service,
Ottawa, 9th April, 1912.

POSITION WANTED.

Technical Graduate, experienced in all classes of freight and passenger equipment in plant office and engineering, will make permanent change to company offering good opening. Apply box 117 S., The Railway and Marine World, Toronto.

Relaying Rails
FOR SALE

6 Miles 56 and 60 lb. per yard with fish plates.
Also 12, 25, and 30 lb.

New Sections Always in Stock

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Offices throughout the Civilized World.
Executive Offices:
NOS. 346 and 348 BROADWAY,
N.Y. CITY, U.S.A.

The Bradstreet Company gathers information that reflects the financial condition and the controlling circumstances of every seeker of mercantile credit. Its business may be defined as of the merchants, by the merchants, for the merchants. In procuring, verifying and promulgating information, no effort is spared, and no reasonable expense considered too great, that the results may justify its claim as an authority on all matters affecting commercial affairs and mercantile credit. Its offices and connections have been steadily extended, and it furnishes information concerning mercantile persons throughout the civilized world.

Subscriptions are based on the service furnished, and are available only by reputable wholesale, jobbing and manufacturing concerns, and by responsible and worthy financial, fiduciary and business corporations. Specific terms may be obtained by addressing the Company at any of its offices.

Correspondence Invited.

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THOS. C. IRVING,
Gen. Man. Western Canada, Toronto.

Public Markets, Limited.—Under the terms of an act to incorporate a public live stock markets board, passed by the Manitoba Legislature in 1911, a company with the title of Public Markets, Limited, was formed, with the C.P.R., the Canadian Northern Ry., and the Grand Trunk Pacific Ry. as the interested parties. An agreement was entered into between the province and the company, Oct. 13, 1911, for the formation of the company, each of the railways holding one-third of the capital stock, and having the right to appoint one director. The C.P.R. transfers to the company certain properties in St. Boniface for stockyard purposes, which are to be laid out and equipped by Oct. 1, and each of the railway companies' contracts to provide the necessary spur tracks to connect their lines with the yards. The city of St. Boniface agrees to construct sewers for the proper drainage of the yards. This agreement has been confirmed by an act passed at the recent session of the Legislature. Another act passed confirms an agreement between the company and the city of St. Boniface, by which $250,000 is to be expended on the laying out of the yards, and the city is to construct the necessary sewer on payment by the company of $20,000, and make roads. It is also agreed that the yards shall be assessed for $250,000 for 20 years.

FOR SALE
Barge "Santiago"

Three masted wooden barge in first class condition. Length, 325 ft.; beam, 45½ ft.; depth, 21½ ft.; gross tonnage, 2,600; net tonnage, 2,525; carrying capacity 5,000 net tons on 18 foot draft. Can be inspected at Yacht Club Lagoon, Toledo, Ohio, and full particulars as to price, etc., can be obtained by addressing C. B. Duffy, Pur. Agt., H.V. Ry., Columbus, Ohio.

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Limited,
SHEFFIELD, ENGLAND.

STEEL AXLES, TYRES, AND SPRING STEEL

"PHŒNIX" Loco. Spring Steel is the accepted Standard in Canada

Sole Agents:
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Complete Hydraulic Equipment
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RAILWAY AND SHIP BUILDING PLANTS
Wheel Presses, Keel Plate Bending Presses, Riveters, Shears, Presses, etc., etc.
Centrifugal Pumps, Pumping Engines, Gas Plants, Gas Power Plants, Cast Iron Pipe, Hydrants, Valves & Fittings, etc., etc.
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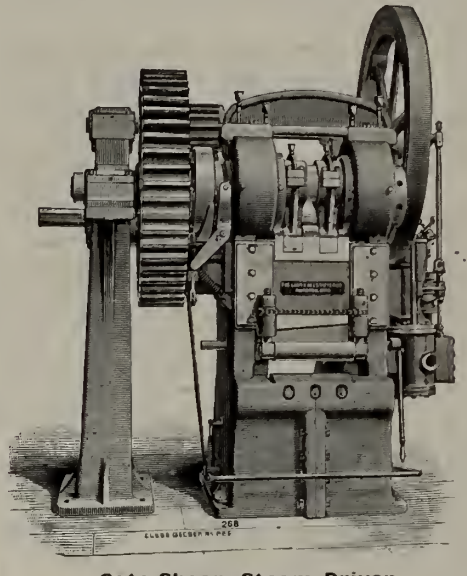
Steel Rails.
Wrought Iron Steel-Tyred Disc Wheels
Locomotive and Car Wheel Tyres.
Axles, Crank Pins, Forgings, Etc.

FOR STEAM AND ELECTRIC RAILWAYS.

OFFICE: Commercial Union Building, 232 ST. JAMES STREET, **MONTREAL**



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Over 350 sizes and styles for all kinds of light and heavy work designed and manufactured by

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Riveting Machines — Tire Welding Machines
Armature Disc Notching Machines
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Write for Catalogue if interested. Correspondence invited.

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Farming and Grazing Lands in Manitoba and the Northwest Territories

ON EASY TERMS OF PAYMENT

Town Lots for Sale at Winnipeg, Ft. William, Edmonton, Prince Albert, etc.

The Company has General Stores at Winnipeg, Vancouver, Calgary, Edmonton, and other places where purchasers will find the best of goods at moderate prices.

Transportation by the Company's Steamers, brigades of boats and canoes throughout the Territories not traversed by railways.

Full information at the Company's Offices, Winnipeg, or 1 Lime St., London, E.C.

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Operating Collieries in Cape Breton, and Cumberland Counties, Nova Scotia.
Output 4,500,000 Tons Yearly

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Screened, Run of Mine and Slack

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Screened, Run of Mine and Slack

Used by Railways, Tramways, Steamships, Manufacturers, Water Works, Light and Power Stations in Ontario, Quebec and the Maritime Provinces, also in Newfoundland and the New England States, Mexico, Sweden, South Africa and the West Indies.

BUNKER COAL Unsurpassed facilities for bunkering ocean going steamers at Sydney and Louisburg, C.B., Halifax, N.S., St. John, N.B., and Montreal, P.Q.

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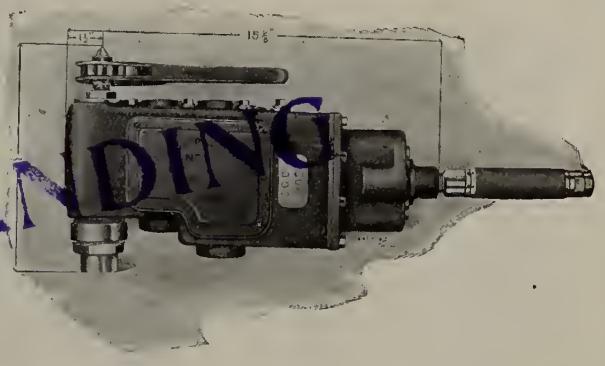
"Little Giant" New Ratchet Close Quarter Drill

Made in two sizes. Capacities 1¼" and 2" in Iron or Steel.



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The use of OUR STEEL BACK SHOE will mean a saving in brake shoe maintenance, brake heads and brake beams.

THE STEEL BACK BRAKE SHOE is an economy on all railway equipment.

LET US PROVE IT TO YOU

American Brake Shoe and Foundry Company

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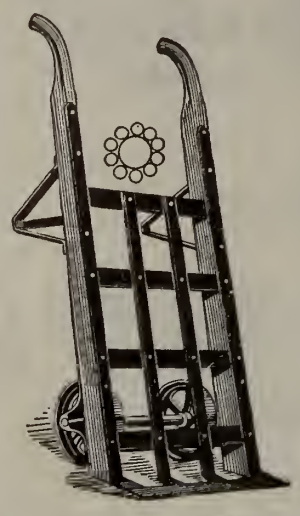
THE HOLDEN CO., Limited, Agents, 354 St. James St., MONTREAL



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The Corbet Roller Bearing Truck

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The Canadian Pacific Railway

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This truck has many **SPECIAL** features over the old style, and is made Strong and Heavy, to withstand the abuse to which it is subject.

The Roller Bearings reduce friction to a minimum, thereby **Doubling** the **Life** of the **Truck.**

Purchasing Agents will consult their own interests by having this **Truck** in their Freight Sheds.

Write for Illustrated Catalogue to

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AND ITS LESSON

The following cities are using Pay-As-You-Enter Cars: Chicago City Railway, 839 cars; Chicago Railways, 1,328; Public Service Corporation of New Jersey, 466; New York City Railway, 555; Third Avenue Railroad, New York, 550; International Railway, Buffalo, 200; Buffalo & Lake Erie Traction Co., 10; Washington Ry. & Elec. Co., Washington, D.C., 100; Capital Traction Co., Washington, D.C., 51; Municipal Traction Co., Cleveland, Ohio, 180; United Rys. Co. of St. Louis, Missouri, 310; Portland Ry., Lt. & Pwr. Co., Portland, Ore., 25; Columbus Ry. & Lt. Co., Columbus, Ohio, 10; Wichita R.R. & Lt. Co., Wichita, Kan., 14; Jacksonville Elec. Co., Jacksonville, Fla., 5; Dallas Elec. Co., Dallas, Texas, 20; Houston Elec. Co., Houston, Tex., 41; Northern Texas Trac. Co., Ft. Worth, Texas, 25; Ithaca Street Ry., Ithaca, N.Y., 2; Peoria Street Ry., Peoria, Ill., 13; Urbana & Champaign Ry., Champaign, Ill., 3; Mutual Lt. & Water Co., Brunswick, Ga., 4; Rochester Ry. Co., Rochester, N.Y., 25; Ft. Dodge, Des Moines & So. R.R. Co., 2; Muskogee Elec. Trac., Muskogee, Okla., 6; Union Traction Co., Dubuque, Ia., 4; Topeka Ry. Co., Topeka, Kas., 12; United Rys. & Elec. Co., Baltimore, Md., 32; Detroit United Ry., Detroit, Mich., 225; Cincinnati Traction Co., Ohio, 50; Montreal Street Railway, 400; British Columbia Elec. Ry., 30; Calgary Street Railway, 18; Metropolitan Street Ry., Kansas City, Mo., 50; Edmonton Radial Ry., 4; San Antonio Traction Co., San Antonio, Tex., 6; Rockford & Int. Ry., Rockford, Ill.; Cairo Street Ry. & Lt. System, 6; Des Moines City Railway, Iowa, 12; Macon Ry. & Lt. Co., Macon, Ga.; Virginia Ry. & Power Co.; Columbia Elec. St. Ry. & Lt. & Power Co., Columbia, S.C.; Aurora, Elgin & Chicago Ry., Chicago, Ill.; Wichita Falls Traction Co., Wichita Falls, Tex.; Ottawa Electric Ry. Co., Ottawa; Bloomington & Normal Ry. & Lt. Co., Bloomington, Ill.; Corsicana Transit Co., Corsicana, Tex.; Compania Electrica y de Ferrocarriles, Mexico; The Milwaukee Elec. Ry. & Lt. Co., Milwaukee, Wis.; Springfield Street Ry. Co., Springfield, Mass.; Lynchburg Traction Co., Lynchburg, Va.; Chicago & Southern Traction Co., Chicago, Ill.; Calumet & South Chicago Ry. Co., Chicago, Ill.

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"A Fresh Water Sea Voyage"

Between Sarnia, S. S. Marie, Port Arthur, Fort William and Duluth.

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Between Parry Sound, Collingwood, Owen Sound, S. S. Marie, Mackinac Island, and Sarnia.

"Amongst the 3,000 Islands"

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LOCOMOTIVE, TENDER AND PASSENGER CAR SPRINGS of every description.
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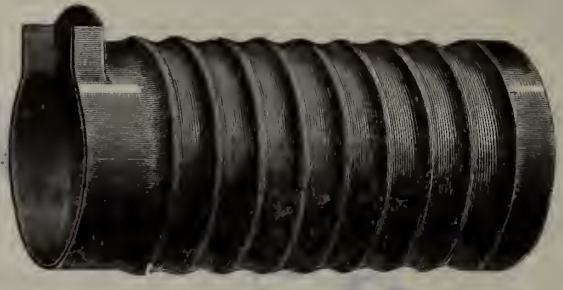
With Plain Ends or Flanged to any required shape.



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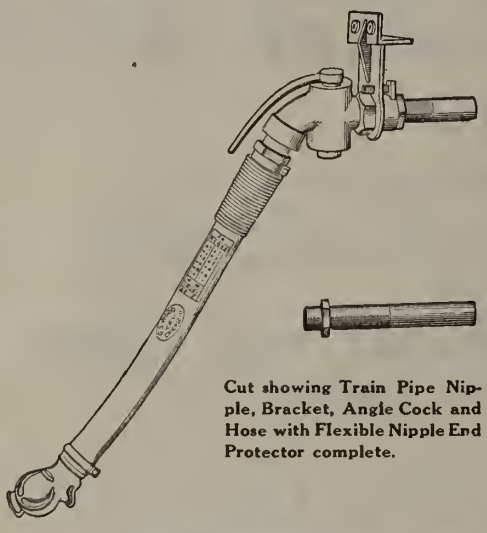

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will absolutely stop shifting and leaking of air-brake train pipes. All M.C.B. requirements are obtained and maintained.

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FOR AIR-BRAKE AND PNEUMATIC TOOL HOSE

will prevent cracking of rubber cover and deterioration due to climatic changes. Easily applied.

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ELECTRIC RAILWAY AND BATTERY BOARDS A SPECIALITY

House Service Type and Traction Meters

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Parties intending purchasing will find it to their interest to let us have their specifications at an early date so as to insure desired deliveries.

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TRACTION METERS

The demand for Car Meters has grown very rapidly and the economies effected by the installation of these instruments have more than justified their use.

The guaranteed accuracy of the Ferranti Traction Meter is 2½ per cent. from full load to 1-10th load.

Will stand 100 per cent. overload for ten minutes.

Interesting data and attractive prices furnished on application to

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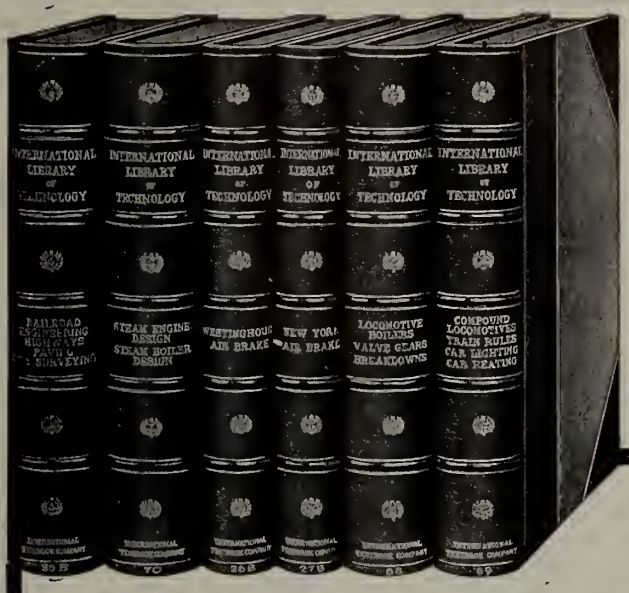

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On the work here illustrated, the average time was

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FASTER AND BETTER THAN MILLING OR PLANING—SMALLER INVESTMENT IN MACHINE AND JIGS—NO CUTTERS TO SHARPEN AND REPLACE.

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H. W. Petrie, Ltd., Agents, Toronto.

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EDISON BSCO PRIMARY BATTERY

The ideal tower battery for a mechanical interlocking plant should be capable of maintaining a uniform voltage under constant discharge and of delivering comparatively high discharges without injury; their condition should be plainly indicated by the appearance of the cell; they should not be affected by slight variations in temperature and they should operate from one renewal period to the next with no expense for maintenance.

The Edison BSCO cells, we believe, possess these qualities more completely than any other type of Primary Battery. The uniformly good service that they can be depended on to furnish from the day set up until the full capacity is consumed, with no attention whatever, makes them the logical cells for this service.

One series of Edison BSCO cells will usually displace a two or three series gravity battery in towers where the ampere discharge is not high. For plants where the demand on the battery is heavy, the multiple series system of hooking up should be used, the number of series being governed by the current demand of each particular plant. In this way extremely long life can be obtained, and you enjoy a feeling of security, knowing that the all important requisite, viz., sufficient voltage to operate all functions without failure, is guarded by a battery of proven reliability—one that will not be affected by momentary heavy discharge, evaporation, buckeled plates, etc. And as time passes this feeling of security strengthens and you realize that whatever else goes wrong you have a battery that can be depended on to do its work day in and day out without failure.

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Boilers - Horizontal Tubular
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Tanks - Iron or Steel of all Kinds.
Air Reservoirs.
Wooden Tanks with Steel Superstructures.

We make a specialty of welded Tanks, without rivets or seams.

Structural Steel
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Portable Flare Lights

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OTTAWA - - CANADA

Eliminate Losses From Fire Blockades

The O-B Emergency Fire Hose Bridge will make it possible for you to run your heaviest cars over several lines of fire hose and save the fares lost by blockades during fires along your line.

It can be carried on your repair wagon and set in position on track very quickly.

Fares lost by a single blockade during rush hours would equip your entire system. Better be prepared.

THE OHIO BRASS CO., Mansfield, Ohio, U.S.A.

Synopsis of Dominion Land Regulations.

Any person who is the sole head of a family, or any male over 18 years old, may homestead a quarter section of available Dominion land in Manitoba, Saskatchewan or Alberta. The applicant must appear in person at the Dominion Lands Agency or Sub-agency for the district. Entry by proxy may be made at any agency, on certain conditions by father, mother, son, daughter, brother or sister of intending homesteader.

Duties.—Six months' residence upon and cultivation of the land in each of three years. A homesteader may live within nine miles of his homestead on a farm of at least 80 acres solely owned and occupied by him or by his father, mother, son, daughter, brother or sister.

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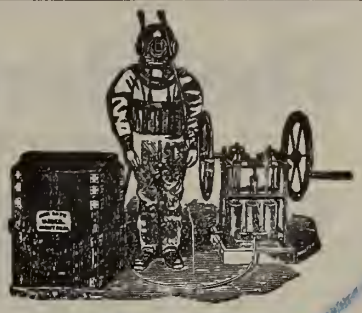

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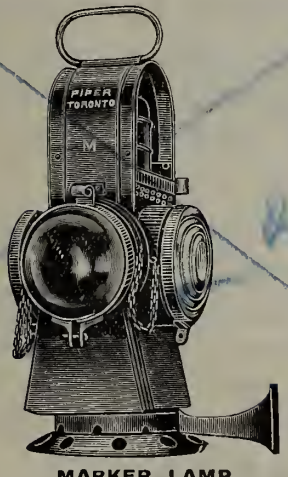

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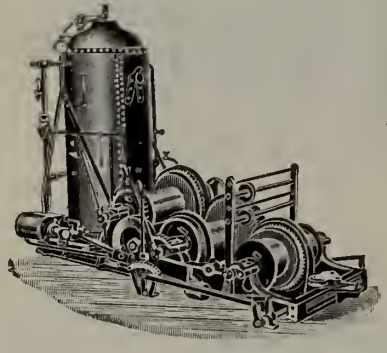

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Stan. Undergr'd Cable Co., Hamilton, Ont.
Hardware
The Hudson's Bay Co. .....
Rice Lewis & Son .....Toronto
Headlights
Commercial Acetylene Co. .....Toronto
The N. L. Piper Ry. Supply Co...Toronto
Pyle National Elec. Headlight Co..Chicago
Safety Car Htg. & Ltg. Co....New York
Headlinings
Crossen Car Mfg. Co. .....Cobourg, Ont.
Heaters, Feedwater
Robb Engineering Co., Ltd.Amherst, N.S.
Heating, Car
Canadian Gold Car H'g & L'g Co..Montreal
Consolidated Car Htg. Co....Albany, N.Y.
Safety Car Heating & L'g Co...New York
United States Light & Heat Co.New York
Heating Plants, Steam
National Boiler Washing Co. ....Montreal
Heating, Roundhouse and Power House
National Boiler Washing Co. ....Montreal
Hoists, Pneumatic
Taylor & Arnold .....Montreal
Hooks
Steel Co. of Canada, Ltd..Hamilton, Ont.
Hoppers, Car, Wet or Dry
Duner Co. .....Chicago, Ill.
Hose, Air Brake and Steam
Safety Car Htg. & Ltg. Co....New York
Guilford S. Wood .....Chicago, Ill.
Hydrants
Canada Foundry Co., Ltd. .....Toronto
Canadian Fairbanks-Morse Co...Montreal
Kerr Engine Co. .....Walkerville, Ont.
Hydraulic Equipment
R. D. Wood & Co. .....Philadelphia, Pa.
Illustrations
Acton Burrows, Limited .....Toronto
Injectors
T. McAvity & Sons .....St. John, N.B.
Inspections
R. W. Hunt & Co. .....Montreal
Insulators, Porcelain
Canadian Gen. Elec. Co., Ltd.....Toronto
Ohio Brass Co. .....Mansfield, Ohio
Insurance, Accident
Canadian Ry. Accident Ins. Co...Ottawa
Imp. Guarantee & Acc. Ins. Co..Toronto
Interlocking Plant and Signals
Canadian Steel Foundries, Ltd...Montreal
Railway Signal Co. of Can., Ld..Montreal
Saxby & Farmer, Ltd. .....Montreal
Iron and Steel Bars
Steel Co. of Canada, Ltd..Hamilton, Ont.
Iron, Pig
Nova Scotia S. & C. Co.New Glasgow, N.S.
Iron Signs
Acton Burrows, Limited .....Toronto
Jacks
Canadian Fairbanks-Morse Co...Montreal
Canadian Steel Foundries, Ltd...Montreal
Dominion Equip. & Supply Co..Winnipeg
Mussens, Ltd. .....Montreal
A. O. Norton .....Coaticook, Que.
Japans
The Dougall Varnish Co., Ltd...Montreal
Journal Bearings
Canadian Bronze Co. .....Montreal
Crossen Car Mfg. Co. .....Cobourg, Ont.
Kerr Engine Co. .....Walkerville, Ont.
Jas. W. Pyke & Co. .....Montreal
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McCord & Co. .....Chicago, Ill.
Junction Boxes
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Can. H. W. Johns-Manville Co. Ld..Toronto
Taylor & Arnold .....Montreal
Lamps and Lanterns
The Hudson's Bay Co. .....
The Hiram L. Piper Co. .....Montreal
The N. L. Piper Ry. Supply Co...Toronto
Lamps, Arc
Canadian Gen. Elec. Co., Ltd.....Toronto
Northern Electric & Mfg. Co.....Montreal
Lamps, Gas
Commercial Acetylene Co. .....Toronto
Safety Car Htg. & Ltg. Co.....New York
Lamps, Incandescent
Canadian Gen. Elec. Co., Ltd.....Toronto
Canadian Westinghouse Co.Hamilton, Ont.
Lamps, Switch
The N. L. Piper Ry. Supply Co...Toronto
Lathes
John Bertram & Sons Co...Dundas, Ont.
Canada Machinery Corporation.Galt, Ont.
Mussens, Ltd. .....Montreal
Lighting, Buoy
International Marine Signal Co. ..Ottawa
Safety Car Htg. & Ltg. Co.....New York
Lighting, Car
Canadian Gold Car H'g & L'g Co.Montreal
Commercial Acetylene Co. .....Toronto
Safety Car Heating & Ltg. Co.New York
United States Light & Heat Co.New York
Lighting, Signal
Commercial Acetylene Co. .....Toronto
Lights, Contractors' and Wrecking
Dominion Equip. & Supply Co..Winnipeg
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Mussens, Ltd. .....Montreal
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Ohio Brass Co. .....Mansfield, Ohio
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Baldwin Locomotive Works..Philadelphia
Canadian Locomotive Co...Kingston, Ont.
International Marine Signal Co. ...Ottawa
Montreal Locomotive Works .....Montreal
Locomotives, Contractors'
Dominion Equip. & Supply Co..Winnipeg
Locomotives, Electric
Baldwin Locomotive Works..Philadelphia
Canadian Gen. Elec. Co., Ltd. ....Toronto
Montreal Locomotive Works .....Montreal
Locomotives, Logging
Baldwin Locomotive Works..Philadelphia
Canadian Locomotive Co...Kingston, Ont.
Locomotives, Rack
Baldwin Locomotive Works..Philadelphia
Canadian Locomotive Co...Kingston, Ont.
Montreal Locomotive Works ....,Montreal
Locomotives, Steam
Baldwin Locomotive Works..Philadelphia
Canada Foundry Co., Ltd.....Toronto
Canadian Fairbanks-Morse Co...Montreal
Canadian Locomotive Co...Kingston, Ont.
J. T. Gardner .....Chicago, Ill.
Montreal Locomotive Works .....Montreal
Vulcan Iron Works .....Wilkesbarre, Pa.
Lorries, Tracklaying
Crossen Car Mfg. Co. .....Cobourg, Ont.
F. H. Hopkins & Co. .....Montreal
Lubricants
Ry. Asbestos Pkg. Co...Sherbrooke, Que.
Lubricators
Can. Detroit Lubricator Co., Windsor, Ont.
McCord & Co. .....Chicago, Ill.
Taylor & Arnold .....Montreal
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Parry Sound Lumber Co. .....Toronto
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M. Beatty & Sons .....Welland, Ont.
Canadian Fairbanks-Morse Co...Montreal
Dominion Equip. & Supply Co..Winnipeg
J. T. Gardner .....Chicago, Ill.
F. H. Hopkins & Co. .....Montreal
Mussens, Ltd. .....Montreal
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Machines, Car Shop
John Bertram & Sons Co....Dundas, Ont.
Canada Machinery Corporation.Galt, Ont.
F. H. Hopkins & Co. .....Montreal
Machines, Cement
Jas. W. Pyke & Co. .....Montreal
Machines, Drilling
John Bertram & Sons Co. ..Dundas, Ont.
Canada Machinery Corporation..Galt, Ont.
Machines, Hoisting
Brown Hoisting Machinery Co..Cleveland
Machines, Milling
John Bertram & Sons Co. ..Dundas, Ont.
Canada Machinery Corporation.Galt, Ont.
Machines, Planing and Shaping
John Bertram & Sons Co. ..Dundas, Ont.
Canada Machinery Corporation..Galt, Ont.
Machines, Radial Drilling
John Bertram & Sons Co. ..Dundas, Ont.
Canada Machinery Corporation..Galt, Ont.
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Long & Allstatter Co. ....Hamilton, Ohio
Machines, Slotting
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Canada Machinery Corporation..Galt, Ont.
Machines, Tracklaying
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Flannery Bolt Co. .....Pittsburgh, Pa.
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Canadian Steel Foundries, Ltd..Montreal
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Nova Scotia S. & C. Co.New Glasgow, N.S.
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John Bertram & Sons Co...Dundas, Ont.
Canadian Steel Foundries, Ltd..Montreal
B. J. Coghlin Co. .....Montreal
F. H. Hopkins & Co. .....Montreal
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Tools, Pneumatic
The Holden Co., Ltd. .....Montreal
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Canadian Steel Foundries, Ltd...Montreal
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Canadian Bridge Co.....Walkerville, Ont.
Dominion Bridge Co. .....Montreal
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THE VICTORIA ROLLING STOCK AND REALTY CO. OF ONTARIO, LIMITED.

NOTICE is hereby given that a dividend of three per cent. on the paid-up capital stock of the Company for the half-year ended May 31st, 1912, has been declared payable June 1st, 1912, to the shareholders of record as of the 31st of May, 1912.

By order of the Board,

G. P. CHISHOLM, Secretary.

Toronto, May 20th, 1912.

THE CANADIAN PACIFIC RAILWAY COMPANY.

Dividend Notice.

At a meeting of the Board of Directors, held to-day, a dividend of two and one-half per cent. on the Common Stock for the quarter ended 31st March last, being at the rate of seven per cent. per anum from revenue and three per cent. per annum from interest on the proceeds of land sales and from other extraneous assets, was declared payable on 29th June next to shareholders of record at 1.00 p.m. on 1st June next.

By order of the Board,

W. R. BAKER, Secretary.

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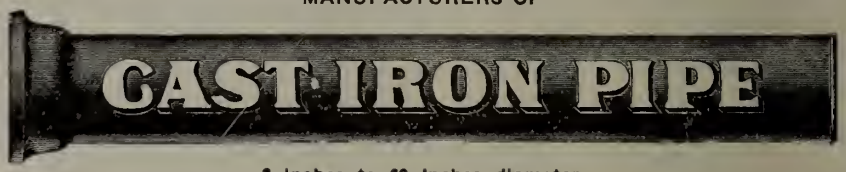

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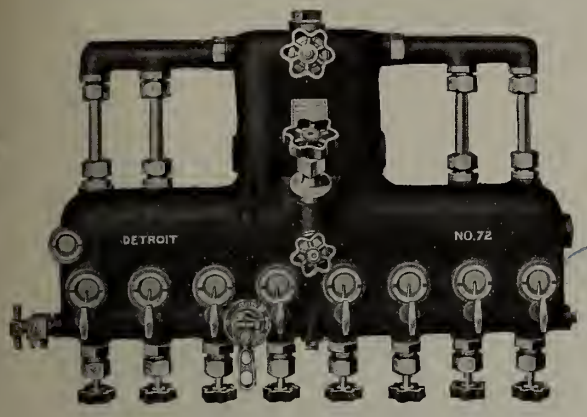

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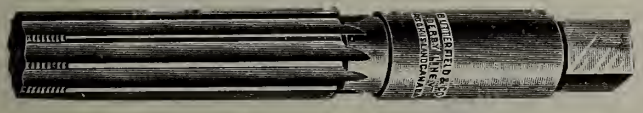

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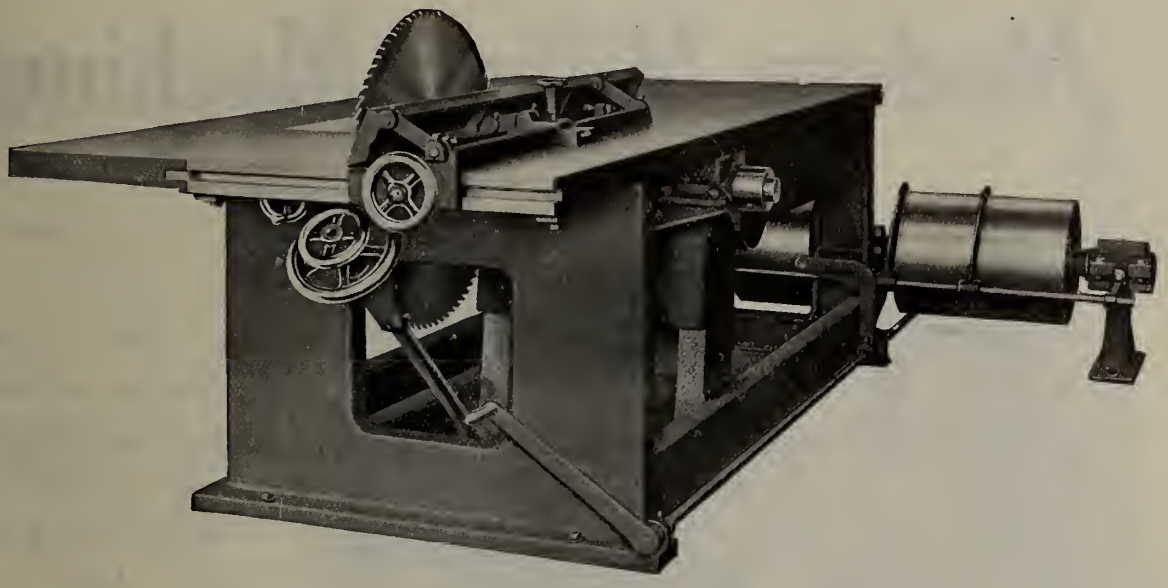

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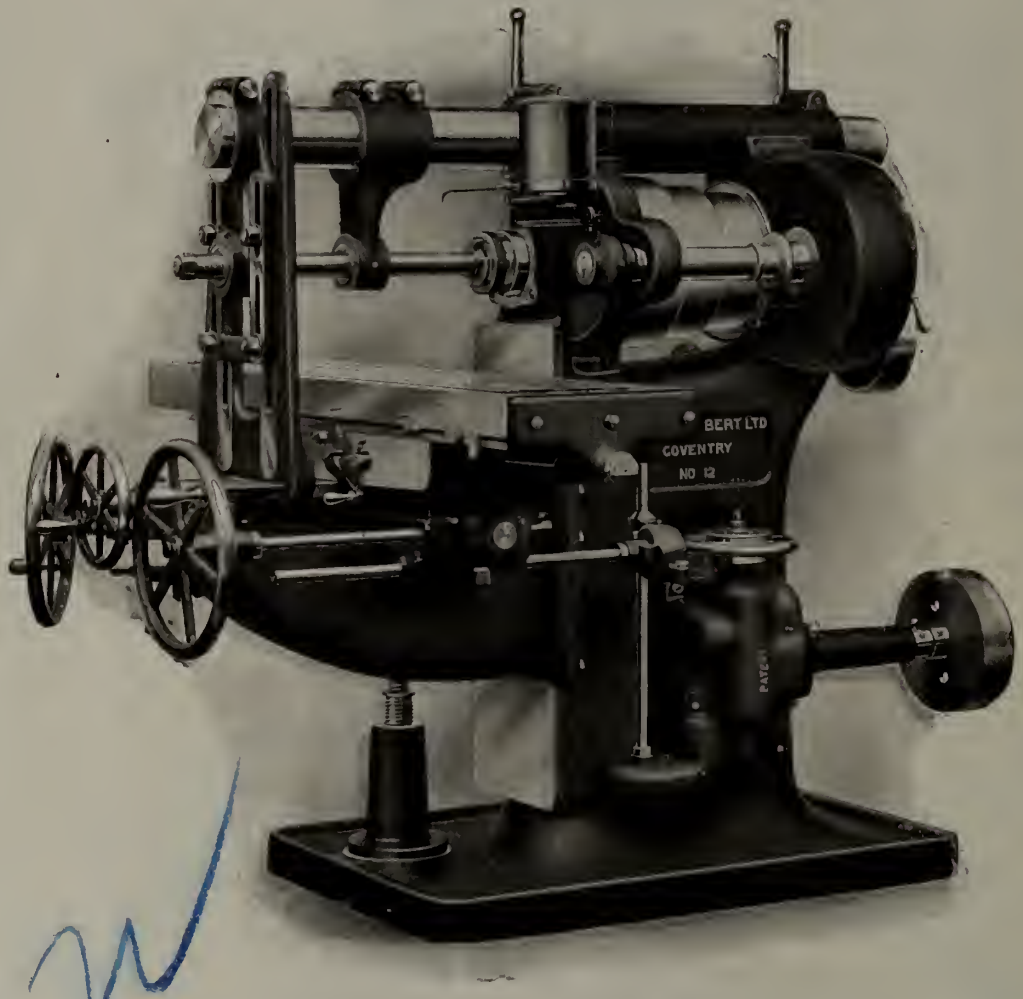

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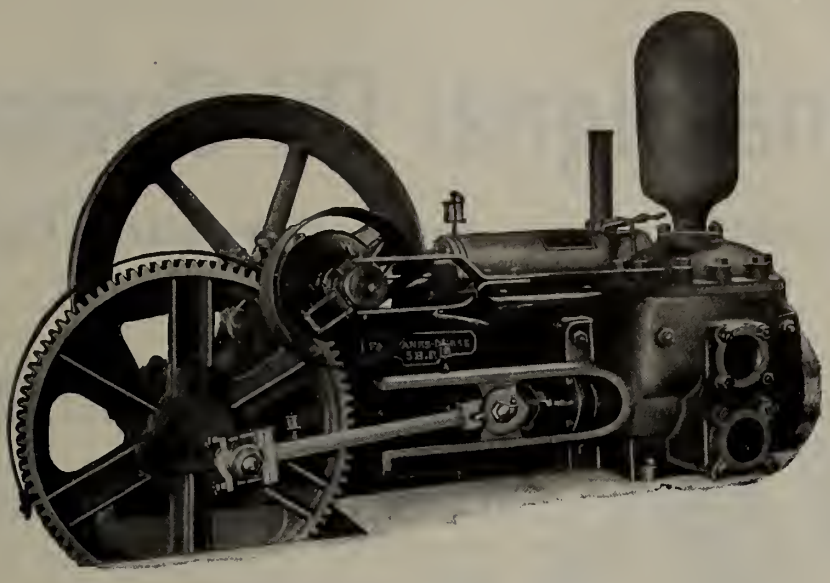
Cylinders, 22 x 26 inches.
Maximum tractive power, 28,900 pounds.

MONTREAL LOCOMOTIVE WORKS, LTD.

BANK OF OTTAWA BUILDING, MONTREAL, CANADA



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Our Water Station Equipment will reduce your expenses, such as attendance, maintenance and fuel cost to a minimum. A great advantage in this system, whether for railroads water station or for town waterworks, is the little attendance necessary. A section foreman or a station agent can look over the engine and start it before taking up his other duties.

We contract for complete erection of these tanks and the furnishing of pumping machinery.

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GUARANTEE COST per thousand miles for from one to five years, when conditions warrant it.

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S. A. MEGEATH,

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Leading chemists and metallurgists recommend that Titanium Alloy be used to purify and strengthen all steel and iron. Their opinions are unbiased and well worth reading. Ask for them.

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Titanium alloy is the only alloy that has been successfully used in steel rails. It has made possible high-carbon rails free from brittleness and of unusual durability. The output of Titanium steel to-day is greater than the combined output of all other alloy steels.

CHANGE

Output of Titanium Steel in 1910 was 326,300 gross tons.
Output of Titanium Steel in 1911 was 410,600 gross tons.

You will find much interest in our Booklet No. 30. It proves, by facts and figures, that it certainly pays to use and specify our Titanium Alloy.

Titanium Alloy is made for Canadian consumption by Electro Metals, Ltd., Welland, Ont.

TITANIUM ALLOY MANUFACTURING COMPANY

Manufactured in Canada under Rossi Patents

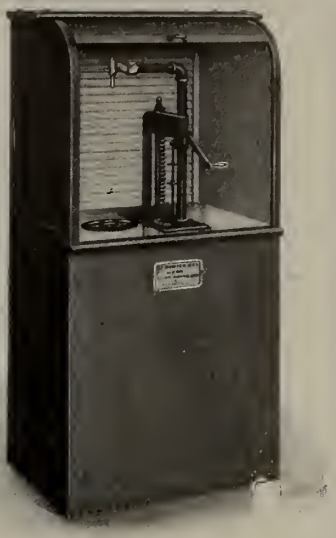
Pacific Coast Agents
ECCLES & SMITH CO.
Los Angeles, San Francisco and Portland
CHAS. V. SLOCUM
General Sales Agent
630-631-632 Oliver Bldg.
Pittsburgh, Pa.

Canadian Agents
R. J. Mercur & Co.
MONTREAL

Processes and Products Fully Patented

H. H. COOK
District Agent
Peoples Gas Building, Chicago, Ill.
THE PRIMOS CHEMICAL CO.
Primos, Delaware County
Pennsylvania

The Statement of a Railroad Storekeeper



Cut 523

Here is a report made by Mr. J. P. Murphy, General Storekeeper for the L.S. & M.S.R.R.:—

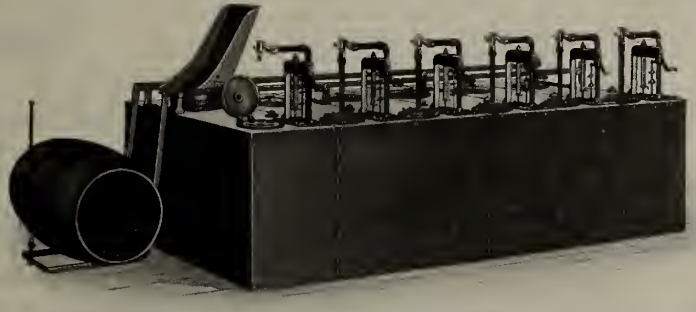
"In the handling of oils the Bowser System is being used extensively, and with it, at every engine house where it has been installed, we have been able to DECREASE *our forces* TWO MEN, *one night and one day, as it has been entirely possible to have the supply man deliver the oils in addition to his other duties. The pumps are located so the oils and supplies are delivered over the same counter."*

The above is copied verbatim from his report to the convention. This shows the economy of the Bowser System under actual working conditions.

Why can't you save the labor of *two men* and maintain absolute accuracy in your oil department?

Marine Oil Storage

There is no place where more scrupulous care should be used than on steam ships, etc., not alone for the sake of cleanliness and economy, but a dirty engine-room is always a constant fire hazard.



Battery of Cut 64'S

The Bowser System has been especially designed for marine use. When desired the pumps are trimmed in polished brass to harmonize with the fittings in the engine-room.

Why not get our literature on this matter and see just how much improvement can be made in handling your oil? Ask for catalogue No. 18.

S. F. Bowser & Co., Inc., Toronto, Ont. 66-68 Frazer Avenue

For twenty-seven years manufacturers of self-measuring oil pumps and tanks, gasoline and oil storage systems, oil filtration and circulating systems, etc.

LINE MATERIAL

For Every Class of Service

Pole Brackets and Fittings
Suspensions of all types
Soldered, Clinch and Mechanical Ears
Splicing Sleeves
Strain Insulators
Feeder Wire Insulators
Trolley Frogs and Crossings
Rail Bonds

Designed to **meet** the most Severe Service. Made of the **Best Materials** and subject to **Thorough Factory Inspection**

CHANGE

Our facilities are also excellent for handling orders for other miscellaneous construction and equipment supplies, such as the following lines :

Bolts, Nuts and Washers — **Guy Anchors** — **Galvanized Strand**
Trolley Bases — **Turnbuckles** — **Harps and Wheels**
Iron and Wood Pole Brackets — **Car Lighting Fixtures**
High Potential Insulators and Accessories — **Luminous Headlights**
Circuit Breakers — **Anchor Rods** — **Motor Repair Parts, etc.**

A Large Stock carried at each branch office

Canadian General Electric Co.

Limited

Toronto Montreal Halifax Ottawa Cobalt
Winnipeg Calgary Vancouver Nelson Prince Rupert

THE
STEEL COMPANY OF CANADA
LIMITED

Railroad Track Equipment

Angle Bars Tie Plates

Steel Track Spikes Bolts & Nuts

PIG IRON

Foundry Basic Malleable

Car Axles and Forgings

Invincible Fencing

Bar Iron Bar Steel

Arm Braces Wood and Machine Screws

Copper Trolley Wire, Telephone and Galvanized Wire

Nails Tacks Wrought Pipe

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W. A. MacLennan, Vancouver, B.C.
J. B. H. Rickaby, Victoria, B.C.
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Geo. D. Hatfield, Halifax, N.S.

The Most Remarkable Cab Signal System Ever Devised for Train Operation

THE SIMMEN SYSTEM

THE DISPATCHER OBSERVING MOVEMENT OF HIS TRAIN.

Think of a system of train operation and control by which the dispatcher sits calmly at his desk and

—Can see every move of every train on his road.

—How fast each train is travelling.

—Where it is at any given moment.

—With a single movement of one of his control switches can flash a visible and sound an audible signal right in the cab of the car within a few inches of the driver's face.

—There's more!

—The dispatcher cannot make a mistake and lap two trains on a "meet." His own levers won't let him—they interlock.

—And that's not all!

—Consider what it means for the dispatcher to be able to give a complete "meet" or advance order by a single, simple movement of a control switch. No red tape. No semaphore arms for the driver to see, or perhaps fail to see. No precious minutes wasted. It's all done by the dispatcher in the twinkling of an eye, and the dispatcher cannot make a mistake, as he has before him a constantly moving perforated needle-point record showing the position of the car or train throughout its entire run, and the control switches interlock to prevent "proceed" signals being given to two opposing trains without an intermediate danger or stop signal having first become effective. Every regular train is reminded of every meet by stop signals displayed in the cab when at a safe distance from the meeting point.

—The dispatcher alone decides whether an extra shall pass a siding or enter it.

—All these advantages are exclusive features of the Simmen System of Railway Signalling.

Has any system of train operation and control ever reached your attention which will half so well safeguard and promote your traffic?

Isn't the Simmen System the real solution of your problem of how to shorten the interval between trains with complete safety?

With all its remarkable features, the Simmen System is one of the simplest railway signalling systems ever devised.

You will agree with this statement when you learn the technical details of its operation and realize its low cost of installation and great economy of maintenance.

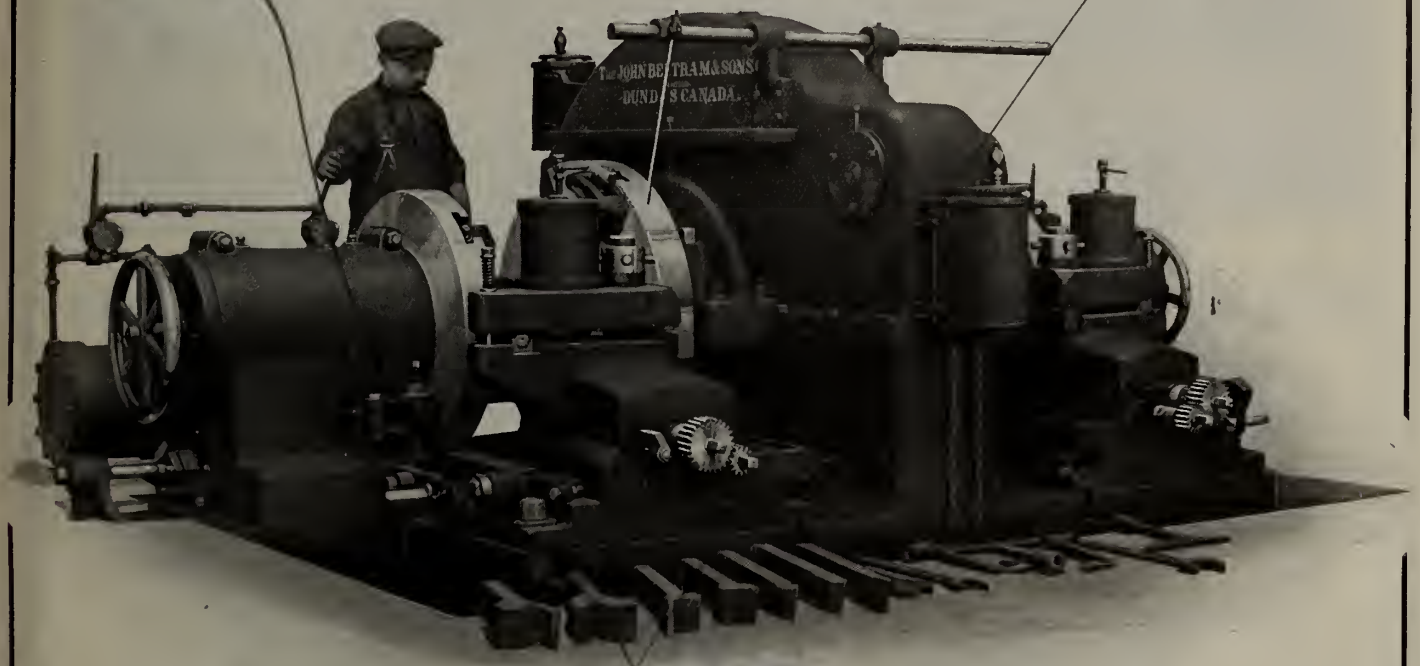
It has proved thoroughly successful on the Toronto & York Radial Railway (electric).

Write for complete description of the Simmen System and its operation.

NORTHEY-PLUMMER, LIMITED

Confederation Life Chambers, - TORONTO

Bertram Tools



42-inch Bertram Steel-Tired Car Wheel Lathe—Motor Driven

Embodying all the latest improvements, including Pneumatic Tool Clamps, Automatic Segment, Air Attachment for moving and clamping the Tailstocks, Power Wheel Lift for centering the Axles in place, and Calipering Device.

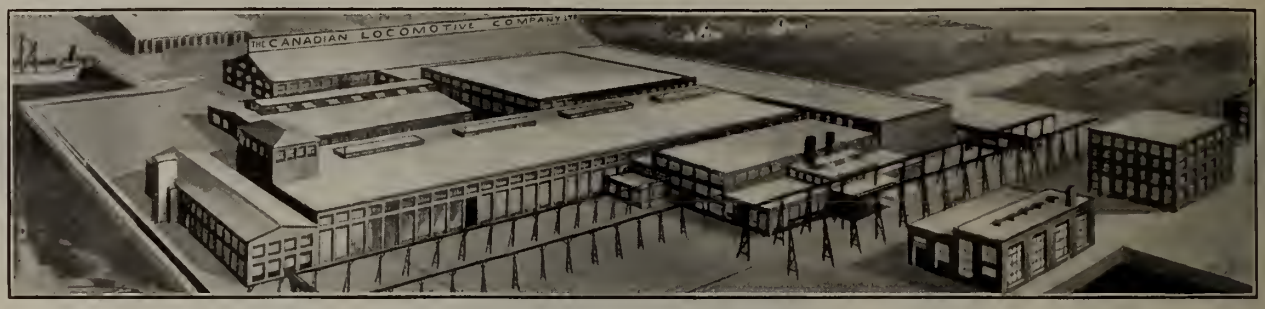
Write for estimates on any tools in which you are interested.

The John Bertram & Sons Co., Limited

Dundas, Ontario, Canada

Agents: The Canadian Fairbanks-Morse Company, Limited

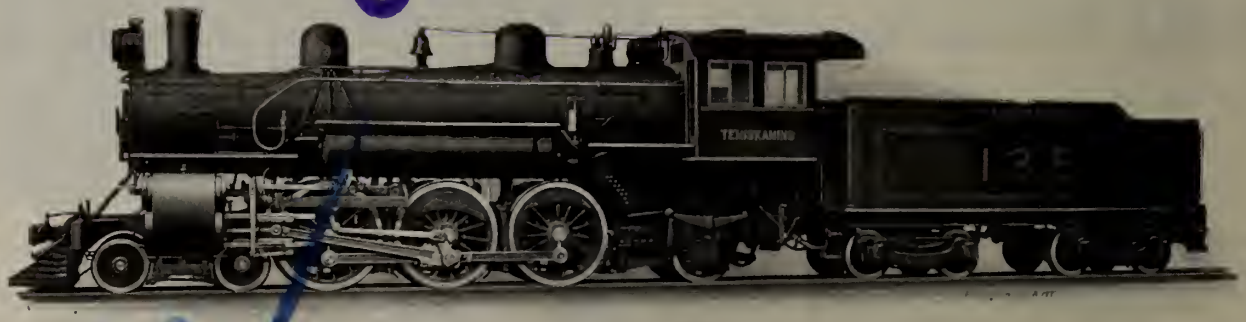
Offices: MONTREAL, TORONTO, WINNIPEG, VANCOUVER, CALGARY, SASKATOON, ST. JOHN



Consolidation Locomotive, built for Canadian Pacific Railway.

Total weight of engine in working order	221,800 pounds
Weight on driving wheels	192,600 pounds
Diameter of driving wheels	63 inches
Boiler pressure	180 pounds
Cylinders	23½ x 32 inches
Superheater	Vaughan-Horsey
Maximum tractive power	43,000 pounds

CHANGE



Pacific Type Locomotive, built for the Temiskaming and Northern Ontario Railway.

Total weight of engine in working order	203,100 pounds
Weight on driving wheels	133,375 pounds
Diameter of driving wheels	69 inches
Boiler pressure	200 pounds
Cylinders	21 x 28 inches
Maximum tractive power	30,000 pounds

Canadian Locomotive Co., Ltd.

KINGSTON, ONTARIO

HOW RAILROADS SAVE MONEY
BY USING THE
TATE FLEXIBLE STAYBOLT

OUR CUSTOMERS REPORT THE FOLLOWING FACTS:

"Locomotives equipped largely with the Tate Flexible Staybolt where bolts are installed properly, have been running over three years with no staybolt breakage, no side sheet cracking, and no engine time lost due to staybolt repairs.

The saving of time incidental to taking like engines out of service for the purpose of renewing broken rigid staybolts, more than pays for the flexible staybolt investment regardless of the cost necessitated by reason of dismantling and reassembling a large portion of the back end covering and boiler attachments, in order to remove and renew broken rigid staybolts, an item which in the aggregate is too large to be overlooked and should be eliminated."

We have always said and now claim with assurance, that if provision is made for flexible connections to firebox by the use of the Tate Flexible Staybolt in locations where expansion is greatest, and the Tate Bolts are adjusted to allow for the difference of expansion between the outer shell and firebox, from the cold to the hot state, staybolt breakage, fire sheet cracking, flue and seam leakage, will be largely, if not entirely overcome, thereby raising the earning value and lowering the cost of maintenance of the locomotive as an earning factor.

This is all being accomplished by customers who first took up the Tate Flexible Staybolt and gave it careful consideration.

Manufactured and sold in Canada by

Canada Foundry Company, Limited

Head Office and Works: TORONTO, Ont.

FLANNERY BOLT COMPANY

Vanadium Building — **PITTSBURGH, PA.** — B. E. D. STAFFORD, Gen. Manager

NICHOLSON
MADE FILES

Never Vary in Quality and Temper

This unvarying quality and temper is due to the specially made steel, special machinery, special methods and the work of wide experienced workmen.

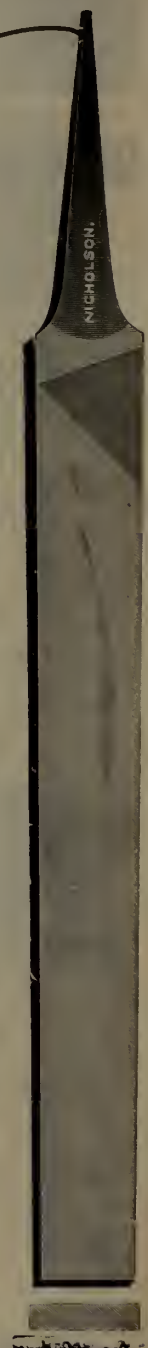
On account of the keen cutting teeth of the Nicholson-Made File, a mechanic can turn out work of better quality and in greater quantity, in less time, than with any other file on the market.

No matter what grade of work you handle, there is a Nicholson-Made File that will meet your requirements and give you the best of satisfaction.

If you want to get full value for money invested, buy a Nicholson-Made File. It is guaranteed good service.

Nicholson-Made Brands manufactured in Canada are:—

AMERICAN,	ARCADE,
GREAT WESTERN,	GLOBE,
EAGLE,	McCLELLAN,
KEARNEY & FOOT,	J. B. SMITH.



NICHOLSON

NICHOLSON FILE CO.

DOMINION WORKS, PORT HOPE, ONT.

QUALITY

JONES' NEW AD.

Telling How the New Shoe is Built Up and the Satisfactory Results

The Body of the Shoe is a medium hard gray iron, poured hot, low in silica and of fine granular structure. The combined and graphitic carbons in this iron are evenly balanced. No chilled metal or freak chemical mixtures.

With these Results: Cast iron has a greater co-efficient of friction than chilled end or insert shoes. (Under 10,000 lbs. shoe pressure 9.7 rise — 7.8 in. last 15 feet.) When desired, however, chilled blocks can be used. The life of your tires is increased; the new shoe does not score the tire, but gives longer service without undue tire wear. Hardness approximately 275 of the Brinnell scale. Shoe loss, 1.5 lbs. per 100,000,000 foot pounds of work on chilled iron wheel.

The two Steel Reinforcements which run the length of the shoe are convex and curved in. The back is greatly strengthened at the centre—the point of greatest stress—by the extension of the steel to form the lug.

Eight per cent. additional breaking strength results from this strong reinforcement, which becomes one piece with the body of the shoe, bonding it together at every point in such a way as to permit the iron body to wear to extreme thinness without danger or breakage.

The Steel Lug which is a projection of the backs is unbreakable—fits accurately and uniformly and is applied easily. No rough or cracked castings to give trouble.

CHANGE

A Marked Advance in Foundry Practice

The Canadian Brake Shoe is the last word in shoe construction: 20 per cent. cheaper to punch and mould than any other.

And a Money Saver

The original saving in weight gives you as many shoes in 19 tons of Canadian Brake Shoes as in 20 tons of other steel back shoes and 24 tons of cast iron shoes, and you get more wear per shoe. Your scrap-heap will not be filled with half-worn, broken or discarded shoes. This means money saved.

The Unbreakable Shoe with the Two Steel Backs.

Manufactured only by

Canadian Brake Shoes Limited

334 St. James Street, Montreal, Que.

COMPRESSED AIR

SOME OF ITS USES IN RAILWAY SHOPS

Starting Fires in Locomotives.
Operating Pneumatic Hammers and Drills.
Cleaning Flues.
Calking Boilers and Tanks
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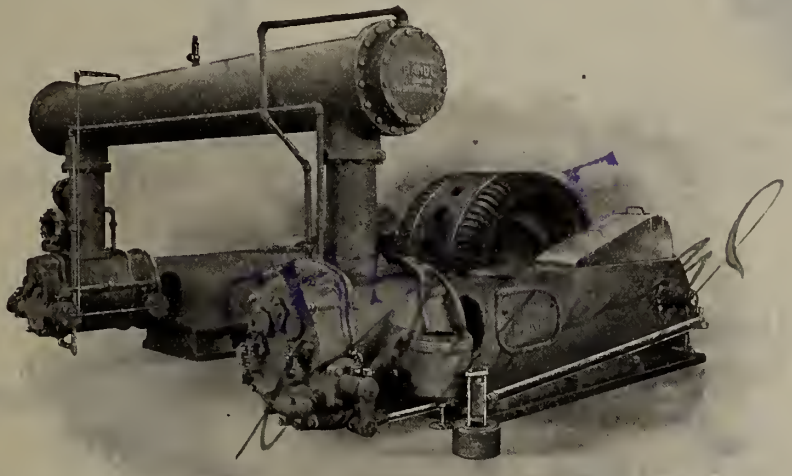

Class "RE" INGERSOLL-RAND Air Compressor Driven by Electric Motor mounted on main shaft of Compressor.

Built in capacities ranging from 837 to 5,000 cu. ft. free air per minute.

The direct electric driven air compressor is the highest refinement in power driven machines. It eliminates both the friction of the belt or gears and the bearing frictions which these drives cause.

INGERSOLL-RAND direct driven air compressors show the highest efficiencies yet obtained in power driven types.

Air Compressors for all capacities and all duties

Pneumatic Riveters,
Pneumatic Chippers,
Pneumatic Sand Rammers,
Air Hoists,
Air Jacks,
Sand Blasts.

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COMMERCIAL UNION BLDG. - - MONTREAL, CAN.

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A few of Our New Improved Pneumatic & Electric Tools

Manufactured by

The Chicago Pneumatic Tool Company

New Improved Ball Bearing
Little Giant Drill.

New No. 10 L. G. Drill
for drilling Staybolts.

New "BK"
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"Duntley" Heavy Duty Side Spindle Electric Drills

Write us for circulars and prices. All tools absolutely guaranteed

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Made by: Woven Steel Hose & Rubber Company,
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The Canada Iron Corporation,

LIMITED

Head Office : MONTREAL

Single plate chilled cast iron car wheel.

Single plate chilled cast iron car wheel.

Spoke pattern chilled cast iron car wheel.

Double plate chilled cast iron car wheel.

Car Wheels for Steam and Electric Railways

ALSO FOR

CONTRACTORS' CARS, Etc.

Loose or Mounted on Axles

Cast Iron Pipe for Water, Gas and Culverts

Castings of all Descriptions Hoisting Machinery

Reinforced Spoke Pattern Wheels.

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THREE RIVERS, P.Q.
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The Canadian Bridge Company, Limited

WALKERVILLE, ONTARIO.

PRODUCTS. Steel Railway Bridges, Steel Highway Bridges, Locomotive Turntables, Office Buildings, and Galvanized or Painted Electric Transmission Towers.

CAPACITY. 40,000 Tons per annum.

The Belly River Bridge on the line of the Canadian Pacific Railway near Lethbridge, Alberta, 300 feet high and 5,400 feet long, which was supplied by us and erected in 1909.

DESIGNS and ESTIMATES. Architects and Engineers are respectfully requested to accompany their inquiries with plans, specifications and full data.

Specify "Anchor" Brand

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SPECIAL PACKINGS

Throttles Air Pumps
Valve Stems and Injectors

DUPLEX SETS

Air Compressors Boiler Feed Pumps
Jones Stokers

Service Guaranteed.

Anchor Packing Co., of Canada

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MONTREAL, QUE.
404 St. James Street

WINNIPEG, MAN.
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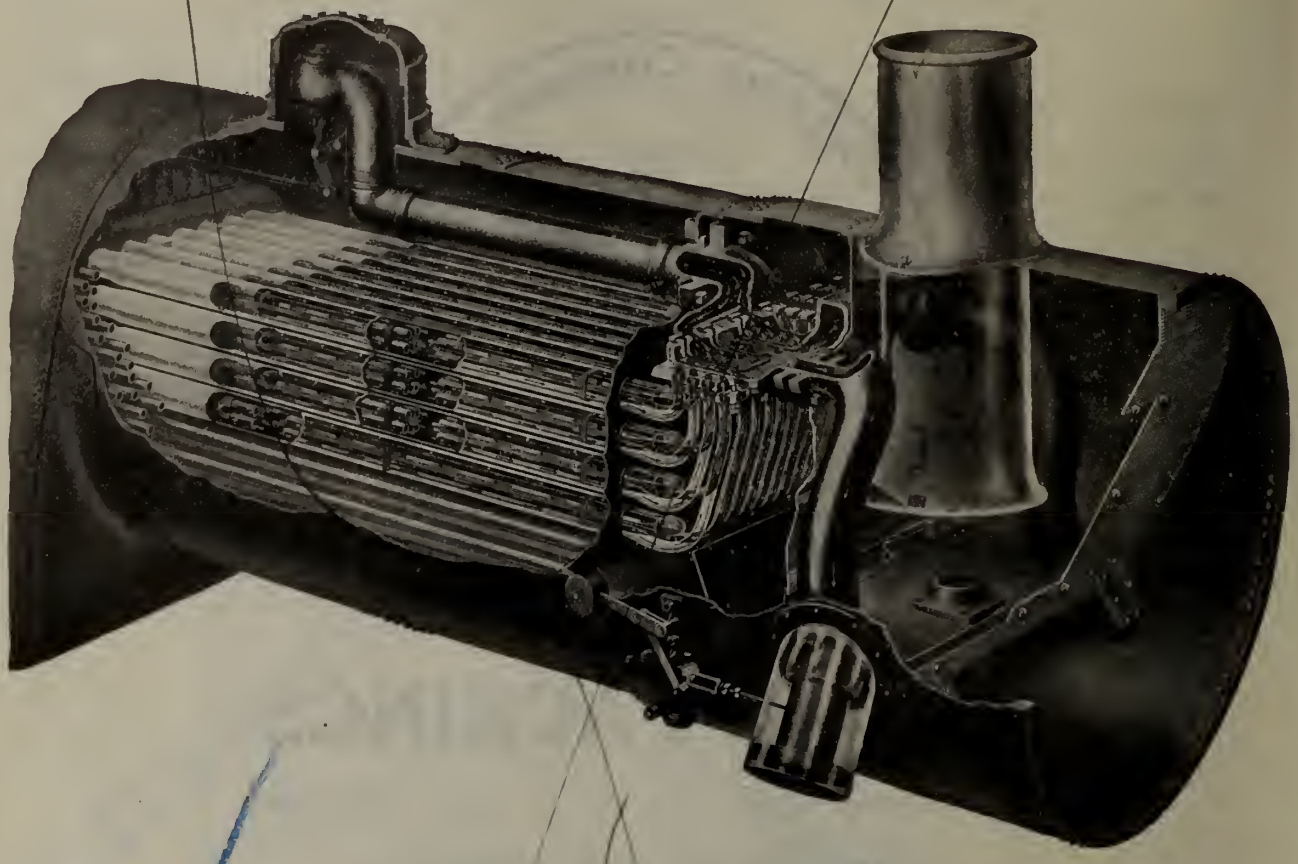
SCHMIDT SUPERHEATER



SIMPLE: In Design, Construction and Application. Every effort is made to provide for the interchangeability of parts, thereby covering as many types of engines with as few parts as possible.

ACCESSIBLE: For inspection and maintenance. The small boiler tubes can be removed and work done on the front flue sheet without disturbing the Superheater.

EFFICIENT: 25% coal saving, 33% increase in hauling capacity.

Locomotive Superheater Co.

30 CHURCH STREET, NEW YORK

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NOVA SCOTIA CAR WORKS
LIMITED

HALIFAX, N.S.

BUILDERS OF

STEEL AND WOOD

FREIGHT CARS

OF ALL KINDS

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ALSO MANUFACTURERS OF

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Absolutely Fireproof : : :

Centrally located. Near-by cars for all stations. All rooms are outside rooms. Baths connecting. Bachelors floor, bath for each 3 rooms. The house is unsurpassed in the care of its guests. Prices moderate.

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Owners and Proprietors

ARTHUR M. GRANT,
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$95

Two-color Ribbon, Back-space Key, Tabulator, Tilting Paper-table, and Other Valuable New Improvements.

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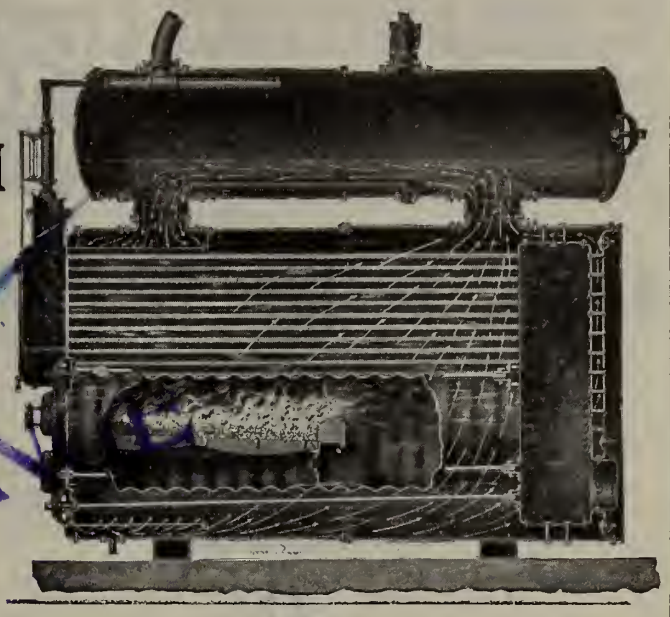

These boilers have all the desirable features of the Standard Marine type, but change the sluggish flow of water into rapid circulation by means of a steam drum and circulating passage under the front neck.

Cost is reduced by using two small shells instead of one large one and by eliminating the flat top of combustion chamber and expensive staying.

Ask for Bulletin No. 3

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Steel Shipbuilders

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Drops, Hydraulic and Dipper Type
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Marine Engines and Boilers—all Sizes

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Finest Roadbed in Canada. Modern and Luxurious Trains. Courteous Employees. Beautiful Scenery. The Best of Everything on this Popular Route.

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BETWEEN MONTREAL AND TORONTO, EACH WAY, DAILY

THROUGH TRAINS between BOSTON (via Boston & Maine R.R. and Cent. Vermont Ry.) MONTREAL, TORONTO and CHICAGO.
THROUGH TRAINS between NEW YORK, TORONTO and CHICAGO via Lehigh Valley R. R. and Niagara Falls.

Dining and Parlor-Library-Cafe Cars on Day Trains — Pullman Sleeping Cars on Night Trains.

THE "INTERNATIONAL LIMITED"

The "Railway Greyhound of Canada," the finest and fastest train in the Dominion, runs every day in the year between Montreal and Chicago.

The Lines of this Great System reach all the Principal Cities and Towns in Quebec and Ontario

W. E. DAVIS, Passenger Traffic Manager, Montreal. G. T. BELL, Asst. Pass. Traffic Manager, MONTREAL.
H. G. ELLIOTT, Gen. Passenger Agent, MONTREAL

Keep the Traffic Moving

By Using

Northern-Electric

Telephone Train Dispatching Equipment

The ability to exchange question and answer produces a spirit of co-operation between all employees of the road.

Operating officials may obtain with ease exact information concerning conditions on any part of their division.

Portable and siding sets prevent the old time delays at points where there is no operator.

Write for Bulletin 3007.

THE Northern-Electric AND MANUFACTURING CO. LIMITED

Manufacturer and Distributor of Telephone Apparatus, Electrical Supplies, and Fire Alarm Apparatus for every possible need. Address our nearest house.

MONTREAL TORONTO WINNIPEG REGINA EDMONTON CALGARY VANCOUVER

TATE FLEXIBLE STAYBOLTS

Allow for and accommodate the forces of expansion and contraction along the lines of least resistance.

The Tate Bolt can be longitudinally adjusted to compensate for the difference of expansion of Outer Boiler Shell over Fire Box.

Over 5,000,000 in service

THE RECOGNIZED STANDARD OF FLEXIBLE STAYS

Manufactured and Sold in Canada by

Canada Foundry Company, Limited

Head Office and Works, Toronto, Ont.

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Vanadium Building Pittsburgh, Pa. B. E. D. Stafford, Gen. Mgr.

ADDITIONAL SAFETY AND ECONOMY IN

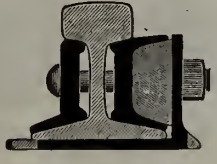
TRACK MAINTENANCE

has been proved by the use of Continuous, Weber and Wolhaupter base-supported rail joints—after fifteen (15) years' service, having a record of over **50,000 miles in use**—the extent of which is evidence of their excellence. Made in Canada.

HIGHEST AWARDS.
Paris, 1900;
Buffalo, 1901; St. Louis, 1904.

Continuous Joint.

Over 50,000 miles in use.


Weber Joint.

Rolled from Best Quality Steel.

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OFFICES: BOARD OF TRADE BLDG., MONTREAL, CAN.

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Canadian Northern Ontario Railway

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The best way to Oshawa, Bowmanville, Orono Port Hope, Cobourg, Trenton & Picton

Through fares include bus fare and hand baggage transfer to Oshawa Town and Bowmanville Town.

¶ Trains run to and from Union Station, Toronto, Union Station with Central Ontario Railway, Trenton, located in the centre of the Town.

Solid Wide Vestibuled Trains.
Parlor Car and Dining Car Service.

Toronto, Parry Sound, Sudbury and Ruel Line

Two trains a day to Parry Sound.

Through Service to Sudbury, Sellwood and Ruel. Daily, Sunday excepted.

Ruel is the Gateway to the Mining Camps at Shining Tree, Gowganda and other new Camps where large operations are under way.

There are many business opportunities along this line.

¶ Write for new folder showing time tables of Canadian Northern Eastern and Western Lines, with maps and full information about the Canadian Northern System, Railways, Steamships, Hotels, Express and Telegraph Service.

CANADIAN NORTHERN STEAMSHIPS, Limited

THE ROYAL LINE

MONTREAL QUEBEC BRISTOL

ROYAL GEORGE AND ROYAL EDWARD

Their equipment and interior appointments are of the most luxurious and modern description, and all the conveniences and comforts that make for an enjoyable voyage have been thoroughly anticipated. Marconi wireless, deep sea telephones, passenger elevators, thermo-tank system of ventilation, superbly appointed cabins.

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ROLLING STOCK

PASSENGER FREIGHT AND ELECTRIC RAILWAY
RUGGLES' ROTARY SNOW PLOWS
CAR CASTINGS, FORGINGS AND REPAIR PARTS

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NOVA SCOTIA STEEL AND COAL CO. LIMITED

MANUFACTURERS OF

Railway and Electric Car Axles, Angle Bar, and Tie Plates, Railway Spikes

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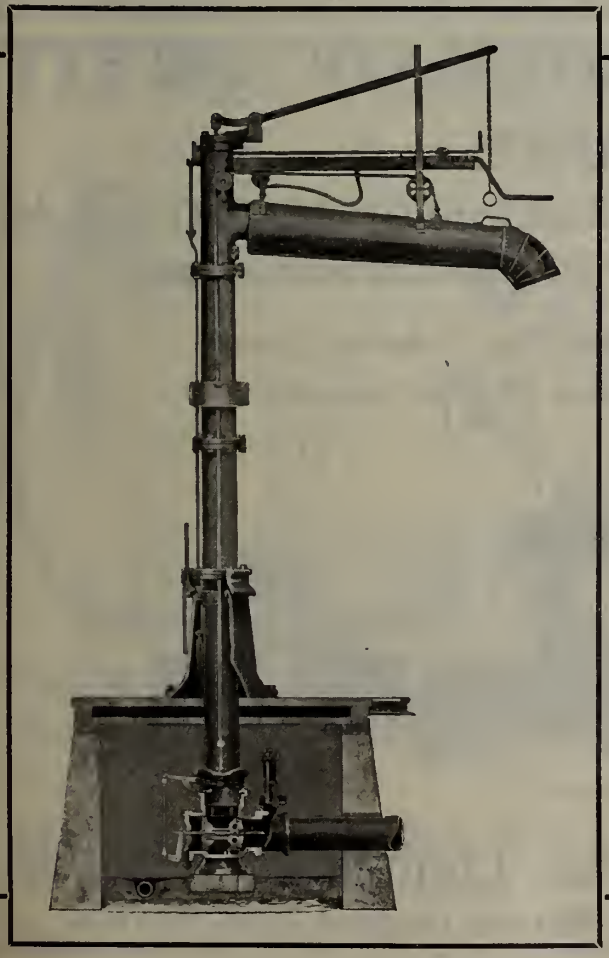

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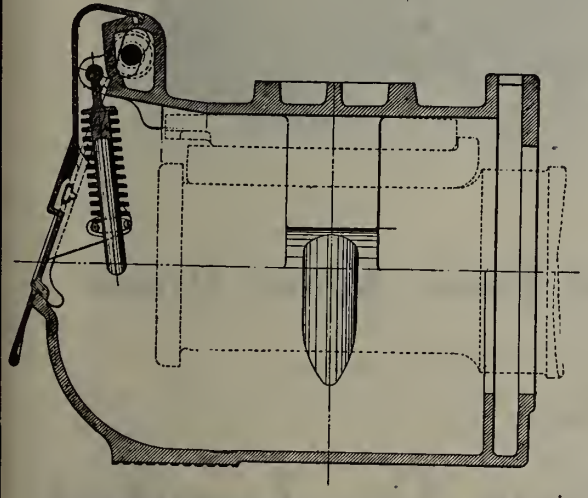

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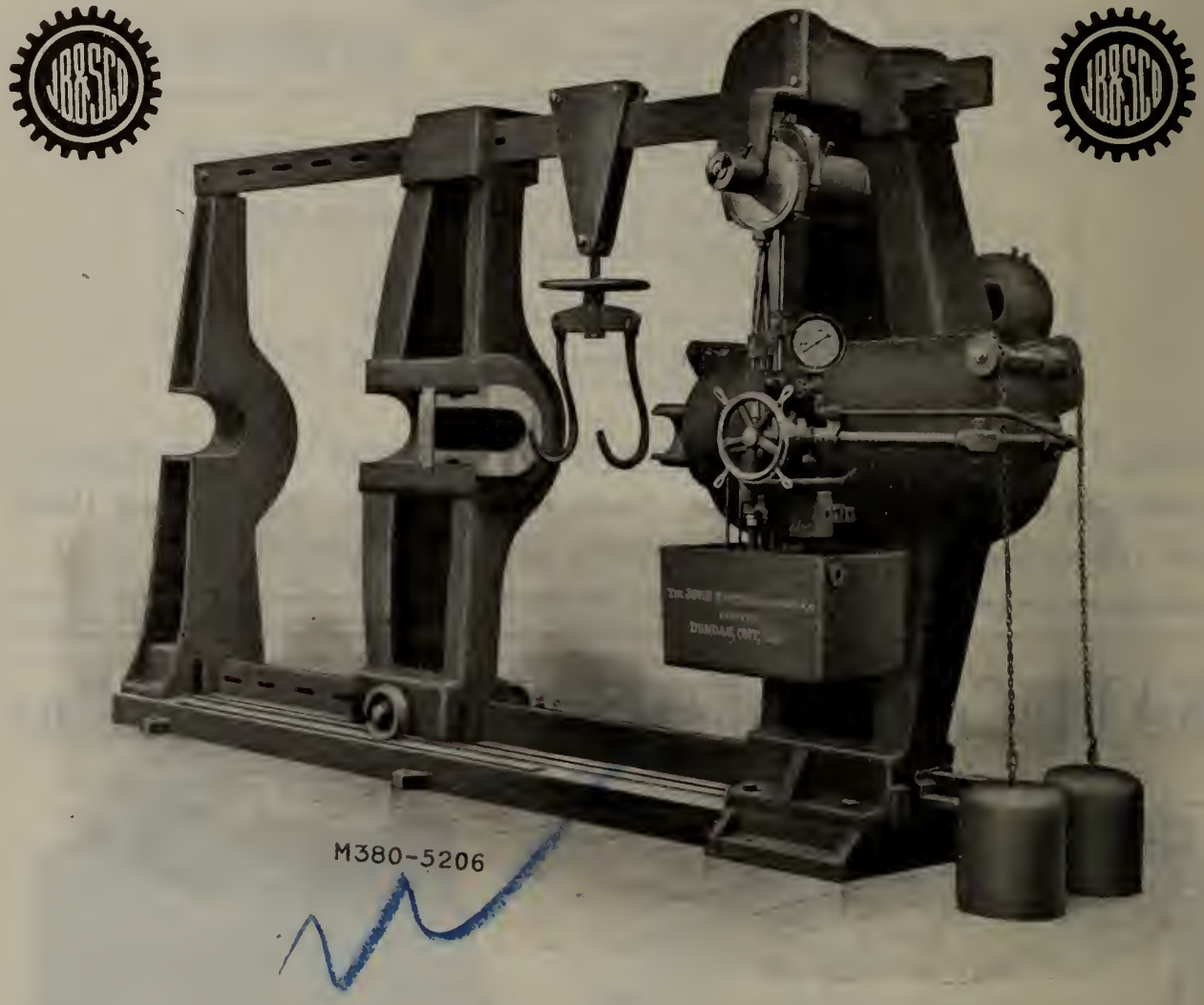

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The Railway and Marine World

July, 1912.

The June Railway Mechanical Conventions at Atlantic City.

The two great railway conventions of the year, the Master Car Builders' Association and the American Railway Master Mechanics' Association, were held at Atlantic City, N.J., the former on June 12 to 14, and the latter on June 17 to 19. The most important features of these annual conventions are the reports of the standing and special committees, the principal ones of which are given on this and following pages, either in full or in abstract:—

The Maintenance of Superheater Locomotives.

The Master Mechanics' Committee, R. D. Smith, Superintendent of Motive Power and Rolling Stock, Boston and Albany Rd., chairman, and of which H. H. Vaughan, Assistant to the Vice President, C.P.R., is a member, reported as follows:—

Your committee was instructed to consider and report on: The best metal for cylinder and steam chest bushings; the best metal for valve and piston rings; the best means of lubricating superheater locomotives.

In order to obtain as much data as possible upon which to base its report, the committee issued a circular of inquiry to the members; the different questions and an outline of replies received being as follows:

The total number of superheater locomotives in service on the railways answering our circular is 2,222, of which 1,748 are of the fire-tube type and 474 of the smoke-box type. So far as the committee is able to ascertain, there are about 2,500 superheater locomotives of the fire-tube type now operating in the United States and Canada, so that the replies represent 70% of the total number of locomotives now in service, using highly superheated steam. This is an exceptionally large percentage and indicates the great interest taken in the use of superheated steam on American railways. In addition to the 36 railways mentioned, replies were received from a number of roads stating their experience had been so limited they did not feel justified in answering the circular.

The following types of superheaters are in use on the railways replying to the circular: Schmidt, Cole, Emerson, Vaughan-Horsey, Baldwin, Jacobs and Vauclain. Of these types, the first four are fire-tube superheaters and the other three smoke-box superheaters.

The results are not based on any particular type of locomotive, as many different classes or types were reported as having superheaters, among which are Pacifics, Consolidations, Mallets, Prairie, Mikado, Mountain and 10-wheelers.

Superheater locomotives have been operating on American railways for 11 years, but most of the 36 roads referred to have been operating them for at least one year.

As might be expected, the steam pressures and degrees of superheat vary considerably on the various types of locomotives on different roads, the maximum steam pressure being 220 lbs. per sq. in., and the minimum 150 lbs. per sq. in. The degrees of superheat, that is, the excess in temperature of superheated steam over the temperature of saturated steam at same pressure, varies from 100° to 250° F. for fire-tube superheaters and from 10° to 65° F. for smoke-box superheaters. The temperature of superheated steam as used in locomotives rarely exceeds 600° F.

Twelve roads reported that cylinder and steam-chest bushings on superheater locomotives wear out more rapidly than on locomotives of the same classes using saturated steam, and 20 roads replied that there is no perceptible difference in the wear of cylinder and steam-chest bushings between locomotives using superheated steam, as now operated, and those using saturated steam. All roads reporting more rapid wear on superheated steam than on saturated steam locomotives have superheaters of the fire-tube type, giving a high degree of superheat, but all roads having superheaters of this type do not report more rapid wear of bushings.

Fourteen railways report that valve-packing rings of superheater locomotives wear out more rapidly than those of saturated steam locomotives of the same classes, and 17 roads state there is no appreciable difference between the wear of the rings on superheater locomotives as now operated and those of saturated steam locomotives.

Sixteen roads report they have found Hunt-Spiller gun iron the best metal for cylinder and steam-chest bushings, and one other road intends to use this iron for cylinder and steam-chest bushings of new locomotives. Nine roads state they are using grey iron for bushings, three roads use the same metal for the bushings of superheater locomotives as is used for saturated-steam locomotives, and one road is undecided as to the best metal.

All the roads favoring the use of Hunt-Spiller gun iron for bushings also favor its use for piston and valve packing rings, and two other roads report using this material for rings but do not use it for bushings.

The ordinary "L" type of spring packing ring is used for valve packing on practically all the railways, and most of them use the ordinary rectangular section rings for piston packing.

Have you used and do you favor the use of packing rings having equalizing holes drilled radially through packing rings to eliminate pressure caused by steam leaking under them? The object of this question was to learn whether any American railroads had adopted packing rings having equalizing holes drilled radially through the ring. Of 36 roads replying, there are but four which have used this type of packing ring and the replies indicate there is no particular benefit to be derived from such a design.

The use of piston rod or valve stem extensions is so closely allied to the consideration of the wear of cylinder and steam-chest bushings, we thought it advisable to include this question in our circular. Replies also placed us in position to better understand conditions under which superheater locomotives are operating. Eighteen roads use piston-rod extensions and 12 use valve-stem extensions, but three of the 18 roads using piston-rod extensions are eliminating them.

Eight roads favor the use of piston-rod extensions, nine favor the use of valve-stem extensions, and six advocate the use of piston-rod extensions on superheater locomotives having large and heavy pistons. Eleven roads are opposed to the use of either piston-rod or valve-stem extensions and two are undecided as to their desirability.

Twenty-three roads report there is no unusual difficulty in properly lubricating the cylinders and steam chests of superheater locomotives as they are now operating. Five roads report it is difficult to properly lubricate superheater locomotives, and three state that trouble was experienced at first, but the use of a different grade of oil has overcome the trouble. One road using balance slide valve states it is difficult to properly lubricate the valve, but no difficulty is encountered in lubricating the cylinders. Reports indicate it is no more difficult to lubricate locomotives with smoke-box superheaters than to lubricate the ordinary saturated steam locomotive.

Twenty-nine roads report using hydrostatic feed lubricators with entirely satisfactory results. There is but one road using mechanical feed lubricator exclusively. Of the roads now using hydrostatic lubricators, four had formerly tried mechanical feed lubricators. The advantages of the hydrostatic lubricator are its reliability, simplicity of construction and ease of regulation as compared with the considerable number of moving parts of mechanical feed lubricators and the tendency of the latter to wear and get out of order.

Atomizers are used on three roads to deliver oil to steam chest of superheater locomotives and results are reported as satisfactory, but we are of the opinion that without atomizers, when the oil is discharged into the steam passageway above the entrance to the steam chest it is partially atomized, which would seem to be desirable. Replies indicate no advantage is derived from the use of an atomizer.

There are a number of different arrangements of oil pipes on superheater locomotives which may be divided as follows: The most common arrangement is that in which the oil is delivered at the centre of steam chest and at the centre of cylinder. Another arrangement is that in which the oil is discharged into the steam passageway above the entrance to the steam chest, with an independent connection to the centre of the cylinder. Some roads use oil connections to both ends of the steam chest, with an independent connection to the centre of the cylinder. A common arrangement, and one that is growing in favor, has a connection which discharges oil into the steam passageway only. It is claimed that the oil is thoroughly mingled with and distributed by the steam. A few roads report having oil connections to the centre of the steam chests only.

Twenty roads consider it necessary to lubricate the cylinders of superheater locomotives independent of the steam chest, eight roads that it is unnecessary and two are undecided.

From replies received and from the experience of members of your committee, there seems to be no doubt that an oil connection into steam passageway only, near entrance to steam chest, is the best arrangement for obtaining satisfactory lubrication. It reduces the number of feeds to a minimum and furnishes sufficient oil to valves and cylinders.

The allowance of valve oil per 100 miles for superheater locomotives varies according to type and service. The maximum allowance reported for Pacific type locomotives with fire-tube superheaters is 3.25 pints per 100 miles and the minimum 1.25 pints, the average allowance being 2.25 pints. For consolidation locomotives with fire-tube superheaters, the allowance of oil varies from 2.50 pints to 1.25 pints, the average being 1.75 pints per 100 miles. The average allowance of oil for Mikado locomotives with fire-tube superheaters is 4 pints and the allowance for Mallets is about 6 pints per 100 miles.

Answers indicate that the allowance of valve oil for superheated steam locomotives varies in about the same proportion as for saturated steam locomotives, according to type and service. It is customary to allow about 45% more oil for the fire-tube superheaters than for saturated steam locomotives, while locomotives with smoke-box superheaters usually have the same allowance of oil as saturated steam locomotives.

Twelve roads report using special superheater oil exclusively on superheater locomotives and 13 roads report using the ordinary grade of valve oil, but all the roads using superheater oil report it is more satisfactory, and tests which have been made of the two kinds of oil, on superheater locomotives, bear out this statement.

None of the roads report the admission of steam automatically to the cylinders when drifting, but 12 roads report good results from keeping the throttle slightly open when engine is drifting, and this practice seems to meet with most general approval.

Answers show that the use of vacuum valves on superheater locomotives is quite general on American railways, as 23 roads report their use gives satisfactory results and five report using by-pass valves.

There are a number of different makes of metallic piston-rod packing in use on superheater locomotives, all reported as giving satisfactory service. In general, the same types are used as on saturated steam locomotives, the principal difference, if any, being in the composition of the rings. The chemical composition of the rings is in most cases unknown to the railways, the rings being purchased in finished state from the manufacturers. Where reports are given, a mixture of 80% lead on 20% antimony has been used with several makes of packing. Some roads have tried a mixture containing a small percentage of tin, but this has been found unsatisfactory. A widely different mixture containing approximately one-half copper and one-half lead has given exceedingly good results, but is expensive. In general, the preferable composition for packing rings is still largely a matter of experiment.

The committee received a great many suggestions and much information that is embodied in the report. The replies were so general as to indicate that this is a very live subject, and the committee feels that a report based on replies from such a large number of railways may be considered as representing conditions prevailing on practically all the railways in the country.

SUMMARY.—An analysis of the replies indicates that the results obtained from superheater locomotives have been very satisfactory. It is interesting to note that five years ago there were less than a dozen superheater locomotives operating in the United States, whereas at the present time there are about 2,500 in the U.S. and Canada having fire-tube superheaters.

Minor difficulties have been experienced on a number of railways, but the great advantages to be derived from the use of superheated steam, such as increased economy of coal and water, increased power, due to the absence of cylinder condensation, the permissible reduction of steam pressure combined with the use of larger cylinders—all obtained without material increase in the size or weight of boiler—leads us to believe that the use of superheated steam in locomotives will increase rapidly. This being so, it is of great importance to determine the metal best suited for use for bushings and packing rings on modern superheater locomotives, because the use of highly superheated steam increases the difficulty of obtaining proper lubrication, and thus the metal is subjected to more severe working conditions than are usually found with saturated steam locomotives. It is also important that we know the best means of securing proper lubrication because the efficiency of lubrication has a direct bearing on the life of bushings and packing rings. A metal suitable for use as cylinder and steam-chest bushings of superheater locomotives should be homogeneous, close grained, tough and of good wearing quality, combined with sufficient strength. It should be tough in order to resist wear, but at the same time it must be of such composition that it can be readily machined.

Replies to the circular indicate that Hunt-Spiller gun iron has been used on many railways with excellent results. This is stated to be an air-furnace charcoal iron, and the process of manufacture, combined with proper chemical composition, seems to result in a metal which is well adapted for use with highly superheated steam. The analysis of this iron, obtained by your committee, is as follows:

Silicon	1.40	per cent.
Phosphorus	0.35	"
Sulphur	0.07	"
Manganese	0.49	"
Combined carbon	0.80	"
Graphite carbon	2.20	"

Replies indicate that this same iron has been used extensively for piston and valve packing rings on superheater locomotives with very satisfactory results and that an iron of this character is the best metal so far produced for piston and valve packing rings of superheater locomotives.

The importance of properly lubricating cylinders and steam chests of superheater locomotives, especially those using a high degree of superheat, can hardly be overestimated, because if proper lubrication is not obtained, many of the advantages derived from the use of superheated steam are offset by continual troubles from excessive cutting of bushings and packing rings, which keep the engine in the engine house when its proper place is on the road.

There seems to be a tendency to use too much oil in superheater locomotives, with the result that there is trouble from the oil carbonizing on the cylinder heads, pistons and steam passages. The deposit of carbon also tends to diminish the life of the metallic piston-rod packing, as it builds up in the stuffing boxes and under the vibrating cups to such an extent that the packing in a short time is forced to carry a part of the weight of the piston rod and piston head.

On certain classes of locomotives, possibly those having pistons exceeding 24-in. diameter, it is considered by some advisable to lubricate the cylinder independent of the steam chest, but in most cases we believe better results will be obtained by eliminating the connection to the cylinders and delivering the oil to the steam passageway.

We do not approve of the arrangement of oil pipes in which the oil is delivered near the end of the steam chest, as in this case it is probable that part of the oil is lost in the exhaust, due to the difference in pressure between the live and exhaust steam. A number of roads report that when superheater locomotives were received from the builders oil was delivered to both ends of the steam chest and to the centre of the top of the cylinder; but this arrangement has since been changed so that the oil is now delivered into the steam passageway above the entrance to the steam chest, and the feed to the cylinder has been discontinued. The allowance of oil has also been reduced and it has been found that the locomotives are much better lubricated than formerly and there is a marked diminution in the quantity of oil adhering to the cylinder heads, piston heads and steam passages.

There can be no doubt of the advisability of using a good grade of mineral oil having a high flash point, for locomotives using highly superheated steam, because the temperature of the superheated steam is sometimes as high as 600° F. A number of the roads state they have used valve oil having a flash point of about 520° and also special superheater oil having a flash point of at least 585°, and in every case better results have been obtained from the oil having the higher flash point.

Tests have shown that a moderately high temperature has very little effect on the lubricating properties of a good grade of valve oil when the oil is protected by steam, but when the engine is drifting there is, in most cases, no steam in the cylinders, and the bushings are apt to become hot. There does, however, appear to be a difference in the results obtained on superheater and saturated-steam locomotives. When drifting the conditions are the same on both, but on saturated-steam locomotives the oil deposit on the cylinders is fluid and the condition of the oil does not appear to have changed; while on superheater locomotives the deposit is gummy and sticky to the touch. This difference may possibly account to a large degree for the rapid wear of piston rings and bushings occasionally experienced on superheater locomotives.

When an engine is drifting a good deal with a closed throttle, there is a considerable vacuum in the cylinders and steam chests, and cinders may be drawn through the exhaust and dirt through the relief valves. This dirt may adhere to the gummy oil on the cylinder walls and convert them into a lap which will wear away the packing rings and piston heads very rapidly. This theory explains the good results obtained on locomotives where the drifting throttle has been carefully used and is supported by analyses of the deposit found on the cylinders, which show the presence of cinders and dirt in considerable quantities. The remedy is obviously to obtain a quality of oil that does not make a deposit of this nature at the temperature to which it is exposed, and to provide means either by ample vacuum or by-pass valves, or by the admission of steam to prevent over-heating when drifting.

Many roads use a tandem type of metallic packing on account of the importance of preventing the blowing out of the lubricating oil, which might result in the cutting of the cylinder bushings. During the past year or two, several alloys have been tried that have given satisfactory results, and while the preferable mixture will vary with the type of packing employed, this question is not now a serious one. It is important to use a type of piston-rod packing which will stand up under the high temperature met with in the use of super-

heated steam, and considerable trouble has been experienced with packing that had proven satisfactory with saturated steam when this point had not been attended to. The melting point of the packing rings should be higher than the melting point of rings usually found on saturated-steam locomotives.

In conclusion, your committee feels that, in order to insure satisfactory results in the operation of superheater locomotives, it is of the utmost importance not only to use the best metals for parts subjected to the action of superheated steam, but it is also important to take all reasonable precautions to obtain proper lubrication.

When superheater locomotives were first placed in operation it was to be expected that certain difficulties would be experienced, but these difficulties have been overcome one by one and we believe that at the present time, with reasonable care in operation and with proper attention on the part of enginehouse forces, superheater locomotives will be no more difficult to maintain than saturated-steam locomotives of the same classes.

Report of Committee on Rules for Loading Materials.

The Master Car Builders' Committee, A. Kearney, Assistant Superintendent of Motive Power, Norfolk and Western Ry., Roanoke, Va., chairman, reported as follows:—

Your committee wishes to report the following recommendations for changes in the present code of rules for loading materials. The modifications, in the main, have reference to reductions in amount of material required to build up loads, having due regard for the safety of cars as well as lading in transit. We have during the past year collected a good deal of information from railways and shippers in connection with the several suggestions we are recommending, some of this information coming to us quite recently.

First, we would direct attention to rule 6, and with particular reference to its apparent conflict with American Railway Association rule 15, some allusion to which was made in our report of 1910. Your committee has had a great deal of correspondence during the past year concerning this particular subject, no doubt mainly brought about by the insertion of the second paragraph of rule 6, which was effected in 1911 on the strength of an interpretation given us by the American Railway Association.

In our 1910 report we stated that the question concerning the apparent conflict between M.C.B. rule for loading materials and American Railway Association rule 15 was first brought up by Mr. Delano, then president of the American Railway Association, who suggested some modification in the rule to make it harmonize with rule 15 of the American Railway Association. Mr. Delano suggested that rule 6 of the rules for loading materials be modified to conform to the principle of run, repair or transfer, in order to increase the movement of cars in interchange. The specific point in rule 6 was its apparent conflict with American Railway Association rule 15, paragraph D, showing the conditions for which the receiving road should pay cost of transfer, the paragraph reading as follows—"The receiving road shall pay cost of transfer or rearrangement: (d) When cars exceed load limit or cannot pass clearances or be moved through on account of any other disability of receiving line."

After the presentation of the 1911 report your committee recommended to the arbitration committee the acceptance of the last suggestion offered by the American Railway Association, which was to add the following paragraph to rule 6:—"Should it become necessary to transfer or rearrange the lading in transit on account of excess width or height of lading, see American Railway Association Car Service rule 15, paragraph D."

This was done under the impression that the supplement would remove the apparent conflict, still leaving rule 6 in such shape as to allow the shippers to build up loads within reasonable limits, without infringing upon the principle involved in American Railway Association rule 15.

The application of the second paragraph or added portion of rule 6 soon demonstrated the wisdom of the rule as it originally stood prior to the change last year, which required that the load be built up with reference to the clearances of the roads over which the lading is routed. In the light of this development the General Managers' Association of New York, at their meeting held there, 1911, concluded to suggest to the American Railway Association certain modifications to American Railway Association rule 15, having further in mind that in the event of the American Railway Association adopting such changes the Master Car Builders should be requested to modify rule 6 for loading materials, erasing therefrom that portion of the rule which was added in 1911, which would leave the rule practically in its original shape. Your committee has no further reference to make relative to rule 6 until the matter is disposed of by the American Railway Association.

RULE 10.—Wooden cars of light capacity when used as idlers between cars of heavier capacity are liable to break down when placed in a train composed of heavier capacity cars, in case of sudden stops or emergency application of the brakes; a paragraph, therefore, should be added to rule 10 reading as follows:—"If the idler is a flat car of wooden construction, its capacity must be not less than that of the carrying cars."

RULE 11.—Change "for" to "from" following "inches" in the middle line of the last paragraph of this rule, which would make the last paragraph read as follows:—"For loads of greater height than 12 ft., subtract 2 ins. from given width (w) of load for every inch of height in excess of 12 ft."

RULE 23.—The first sentence of this rule should be changed to read as follows, so as to also cover the placing of sliding as well as bearing pieces:—"Bearing and sliding pieces must never be placed between bolster and end of car, unless special provision is made therefor in detail instructions."

RULE 43.—This should be changed to read as follows:—"The lading overhanging the idler, figs. 6 and 7, must be governed by restrictions contained in general rule 11, so that overhang will not exceed clearances in curving."

RULE 45.—The last portion of this rule should be changed to read as follows:—"Where the pile of lumber on the idler exceeds 20 ft. in length, four stakes on each side must be used, three on each side being sufficient for shorter piles to conform to rule 34." This would make the new rule read as follows:—"The five stakes on each side of the carrying car should be placed as near the bolsters as possible, and no stakes whatever should be used on the idler to confine the overhanging part. The only stakes permitted on the idler will be such as may be required for the short lumber loaded on the idler. Where the pile of lumber on the idler exceeds 20 ft. in length, four stakes on each side must be used, three on each side being sufficient for shorter piles to conform to rule 34. All stakes should be fastened as shown in figs. 6 and 7, and as provided for in rules 12, 13, 34, 35 and 36."

RULE 55.—We find that some of the Canadian roads have flat cars equipped with permanent chains and short stakes, which are used for the handling of logs, and having ascertained that logs loaded on these cars with this method of binding the lading are safe, we would recommend the addition of the following note immediately after rule 55 so as to allow the use of this equipment for handling the material in question. It would be proper to mention that this subject came up last year, too late to be presented in our report. The subject was put before the executive committee, but was laid on the table. "Logs loaded in accordance with fig. 14, secured by means of permanent short stakes and chains in lieu of the specified staking and wiring will be acceptable."

RULES 56 AND 57.—These two rules should refer to flat as well as low-sided gondola cars, and, therefore, should be changed to read as follows:—

"RULE 56.—When material of this kind is loaded on flat or gondola cars with sides less than 30 ins. high, and lading does not exceed 4 ft. in height measured from floor, and the lading is not loaded in pyramidal form, the stakes must be as high as the lading and must be tied together at the top with not less than eight strands equal to four wrappings of good ⅛ in. diameter wire, and must be tight. Stakes must be sound hardwood, free from knots and of the dimensions specified in general rule 12."

"RULE 57.—If the material is loaded on flat cars or gondola cars with sides less than 30 ins. high, to a height more than 4 ft. measured from floor, opposite stakes must be bound together with wire at about one-third of the height above car floor after one-third of the load has been placed on the car, and in such a manner that when the remaining load is placed on the car the wire will have a tendency to draw the tops of the stakes toward each other. The middle as well as the top wrappings of wire must consist of not less than 10 strands equal to five wrappings of good ⅛-in. diameter wire and must be tight. Bearing pieces may be placed between the lower and upper sections of load to facilitate application of wire after all the lading has been placed on the car. See

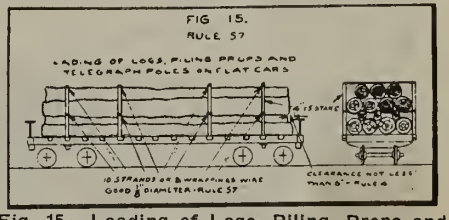


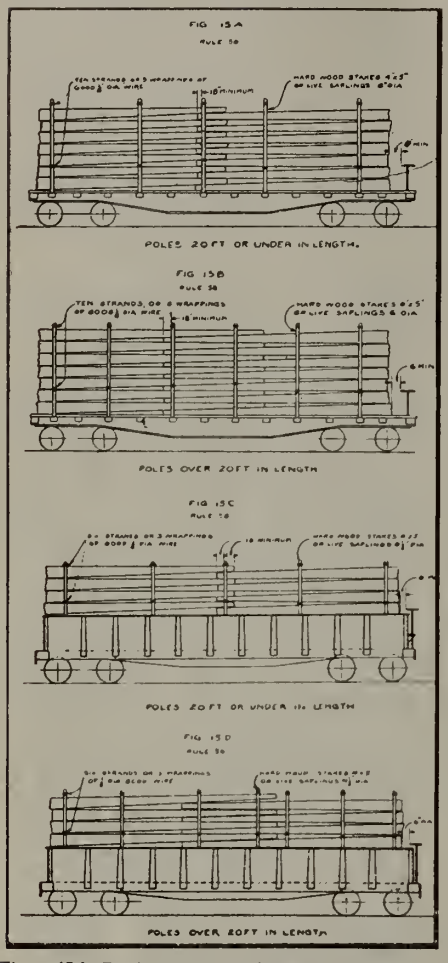
Fig. 15.—Loading of Logs, Piling, Props and Telegraph Poles on Flat Cars.

fig. 15. Stakes must be sound hardwood free from knots and of the dimensions specified in general rule 12. Stakes must incline toward centre of car a total of about 12 ins. before load is placed on car, and in no case will they be allowed to incline away from centre of car after the car is loaded. The inspector must assure himself that all wiring is tight before load is moved."

RULE 58.—Insert the figures "4½" just preceding the word "live" toward end of fourth line, which will then show size of saplings, making the first sentence read as follows:—"When lading is placed inside of a single gondola car with sides 30 ins. high or over and load projects above car sides, not less than three pairs 4 by 4 hardwood stakes or three pairs of 4½-in. live saplings should be well secured to either side of lading on inside of car for piling or props 20 ft. or less in length."

Also add the following paragraph to this rule:—"When lading is in two piles not over 20 ft. in length and ends of piles are interlaced at centre of car as per figs. 15-A and 15-C, there must be not less than five pairs of stakes for total length of load. If the length exceeds 20 ft. as per figs. 15-B and 15-D, there must

be not less than six pairs of stakes for total length of load. The ends of poles



Figs. 15A-D—Loading of Logs, Piling, Props and Telegraph Poles in Two Piles on Flat and Low Gondola Cars.

must extend not less than 18 Ins. beyond the centre stake."

RULE 81.—Some suggestions have been made with reference to handling twin loads of flexible material where the shipment is light and can be handled safely without the use of blocking prescribed for full loads, and in order to make this entirely clear, the following paragraphs should be added to this rule:—

"81-A. If the total weight per bolster, figs. 32 and 33, does not exceed 10,000 lbs., the centre post and bolster cross braces may be omitted, provided the bearing piece is not less than 8 x 10 ins.

"81-B. For twin loads of plates with two bearing pieces and two or four sliding pieces, if the total weight does not exceed 20,000 lbs., or 10,000 lbs. per bearing piece, the centre post and bolster cross braces may be omitted, providing the bearing pieces are not less than 8 by 10 ins.

"81-C. For loads less in weight than those specified in paragraphs A and B, the dimensions of bearing pieces may be proportionately reduced as per rule 29."

RULE 98 A.—Add the word "cars" after the word "hoppers" in the first line last paragraph, which would make this paragraph read as follows:—"When hopper cars or self-cleaning hopper cars are selected the doors must be securely boarded over as per fig. 45-D."

RULE 103.—In order to bring the weight of the lading nearer to the allowable limit for double and triple loads, the following paragraph should be added to provide that girders, either of the solid or latticed type, ranging from 10,000 to 30,000 lbs. each in weight, shall be so arranged that two or more can be loaded side by side on pivoted bolsters:—"Two or more girders may be loaded vertically, side by side, provided they are bolted together near pivoted bolsters, with proper spacing pieces between them, in such a manner that they act as one girder."

FIG. 56.—It is claimed that the method of loading pipe 24 ins. or more in diameter on a flat car in accordance with

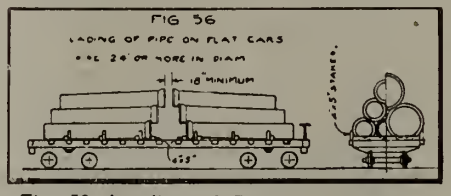


Fig. 56—Loading of Pipe on Flat Cars.

the present figure is wrong on account of there being no provision for holding the second and top tiers of pipe from sliding off endwise. Pipe of this description should be loaded with the bell ends toward the centre of car the bell ends of the second tier overlapping the first toward centre of car. There should be at least 18 ins. clearance between the bell ends of the top tier and when loaded in this manner the end blocking is not required, therefore fig. 56 should be changed accordingly.

RULE 121.—Due to objection on the part of shippers to the size of blocking now specified, and due also to the fact that blocking of smaller dimensions can be used without interfering with the safe movement of boiler shells and tanks this rule should be changed to read as follows:—"Lading of this description, 8 ft. or less in diameter, when loaded on single flat or gondola cars, should be substantially chocked with side blocking in height equal to one-seventh the diameter of the shell, providing that blocking of more than 10 inches in height will not be required. End blocking to be not less than 4 ins. in height. See fig. 64-A."

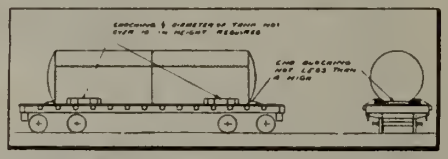


Fig. 64A—Loading Boiler Shells and Tanks 8 ft. or less in Diameter.

"Lading over 8 ft. in diameter, when loaded on single flat or gondola cars with sides less than 30 ins. in height, must be substantially chocked with side blocking not less than 10 ins. in height

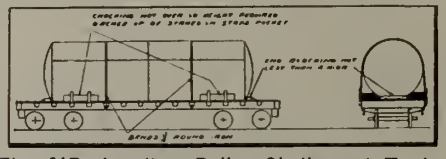


Fig. 64B—Loading Boiler Shells and Tanks over 8 ft. in Diameter.

and backed up by the use of stakes in the stake pockets, and in addition to this must be secured with two bands of not less than ¾ in. round iron or flat bands of equal section. End blocking to be not less than 4 ins. in height. See fig. 64-B."

"When loaded in gondola cars with sides 30 ins. or over in height, the bands will be unnecessary, but precaution with reference to blocking must be taken as specified for lading 8 ft. in diameter."

"When such lading is placed upon two or more cars as a tandem shipment, it should be secured with two bands of not less than ⅞ in. round iron or flat bands of equal section, in addition to the prescribed blocking."

"Steel tanks, lined or unlined, in sections weighing not over 2,500 lbs. per section, 8 ft. or less in diameter, when loaded on single flat or gondola cars, must be substantially chocked on each side with blocks not less than 6 inches in height and of sufficient length and width so that they may be securely spiked to the floor of the car. End blocking to be not less than 4 ins. in height and of sufficient length to provide for proper bearing area against head of tank or shell, and to be securely spiked to the floor of the car. If more than 8 ft. in diameter the same side and end chocking is to be used, and, in addition, each tank or part of tank must be secured with two bands not less than ⅛ by 2 ins. in section passing over the top and properly secured to the floor or stake pockets of the car. In lieu of the bands over the top of the shell the same may be secured to the floor of the car or stake pockets by straps of ¾ in. round iron or equal section, bolted to the flange of the tank or shell with not less than two bolts, the lower end of the strap passing through the floor or stake pocket. See fig. 64-C."

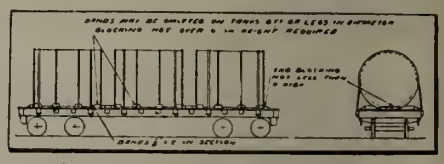


Fig. 64C—Loading Sections of Boilers, Tanks or Shells over 8 ft. in Diameter, Weighing less than 2,500 lbs. per Section.

The heading "Rules Governing the Loading of Mounted Wheels on Open Cars," should be inserted immediately following rule 122, and new rule 122-A should be added to the code to cover the shipment of mounted wheels on flat cars, as follows:—"122-A — Mounted wheels may be loaded on flat cars as shown by figs. 66-B and 66-C. If fig. 66-B is followed, the end blocking must be

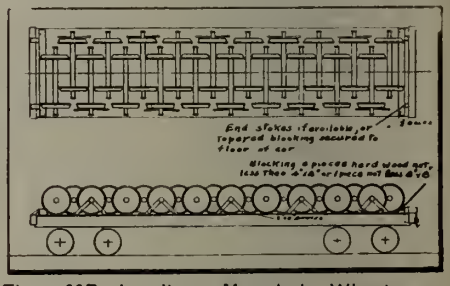


Fig. 66B—Loading Mounted Wheels on Open Cars.

not less than 8 by 8 ins. in section in one piece, or made up of two pieces of hardwood of equivalent section and secured by end stakes in addition to bolts through floor, or by separate blocking pieces secured to floor and end sill with

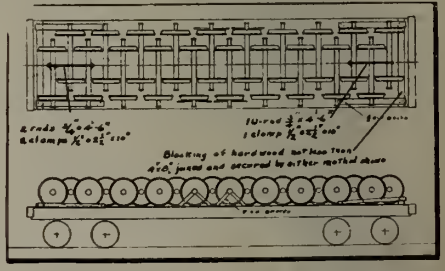


Fig. 66C—Loading Mounted Wheels on Open Cars.

¾ in. bolts. In addition to this, for a full load, five pair of wheels must be secured by 2 by 4 in. hardwood braces as shown, spiked to floor of car."

"If fig. 66-C is followed, three pairs of wheels at either end of load are to be

tied together, using ¾ in. rods with clamp plates or ¾ in. U rod and plate as shown, and blocking at ends and along sides of hardwood not less than 4 by 8 ins., joined and bolted to car floor by either of the methods shown in fig. 66-C."

The two new figures referred to in new rule 122-A should be inserted in the code, immediately following fig. 66 and ahead of fig. 66-A.

RULE 124.—We have had some correspondence in reference to some modifications in the latter part of this rule, referring to the necessity for protection strips being placed in the door openings on cars not equipped with doors, where such cars are loaded with a commodity requiring that the door openings be protected. As the rule now reads, the lading must be protected by placing strips or slab wood, whether the lading does or does not require it; hence, we felt that some latitude might be given the shipper, and therefore wish to add after the words in the second sentence, "cars without doors," the words, "and containing freight of a character requiring it." This would make the second sentence of rule 124 read as follows:—"Cars without doors, and containing freight of a character requiring it, must have the lading protected from falling or rolling out of the car by strips or slab wood, not less than 1½ in. thick at centre, nailed to inside of door posts, and sufficiently close to floor of car and to each other to prevent lading from passing between them."

We have also had a great deal of correspondence recently in refcrence to the subject of proper method of loading triple loads of long flexible material (angle irons and plates) as specifically referred to in paragraph 15-E on pg. 10. It is a fact, if such lading is built up in accordance with the present prescribed practice, and the load bears on the sliding pieces on the centre car, there is some danger of upsetting the car on account of the lading shifting or sliding toward the outer edge in going round a curve, and by its bearing rather heavily at this particular point would contribute to the greatest liability of derailment. Still, we do not feel that we have as yet obtained sufficient data or information along this line to warrant changing the present practice or adding any additional rules to the code, it being our idea that such shipments for the present should be handled under special instructions until we have an opportunity to further study the subject with a view of ascertaining the best and safest practice for shipment of such material.

Report of Committee on Main and Side Rods

The Master Mechanics Committee, W. F. Kiesel, Jr., Assistant Mechanical Engineer, Pennsylvania Rd., Altoona, Pa., Chairman, reported as follows:—

A year ago a progress report was submitted, and criticisms and suggestions requested. Your committee has received none, and therefore assumes that the members are satisfied with the formulae as they stand.

Checking Formulae

All measurements in inches and pounds.

A = Area of section considered

a = Width of section considered

b = Depth of section considered.

C_1 = Maximum compression unit stress for traverse bending.

C_2 = Maximum compression unit stress for vertical bending.

$C = C_1 - C_2$ = Coefficients.

d = Cylinder diameter.

L = Length of rod from centre to centre of pins.

M = Bending moment.

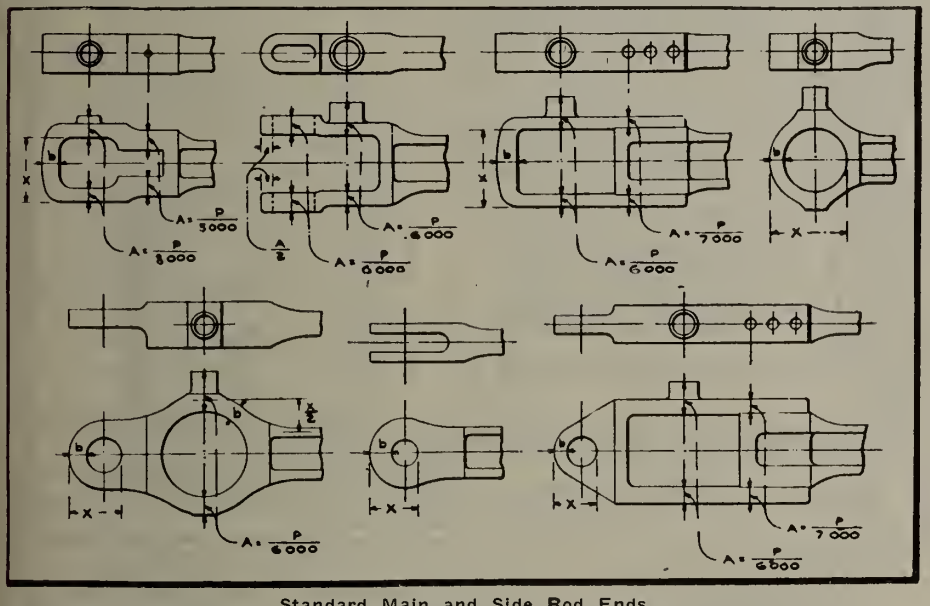
P = Maximum compression strain acting at the end of rod

p = Maximum boiler pressure

Q = Cylinder pressure = $0.7854\ d^2 p$.

R = Radius of driving wheels

r = Radius of crank.



Standard Main and Side Rod Ends.

RG = Radius of gyration of section—axis horizontal.

rg = Radius of gyration of section—axis vertical.

S = Stress. Where used in formulae must not exceed one-sixth of ultimate strength of the steel.

s = Horizontal offset in rod.

SM = Section modulus of section considered—axis horizontal.

sm = Section modulus of section considered—axis vertical.

W = Weight on pairs of drivers actuated through rod considered.

Main rod area must not be less than P÷10000 lbs.

For main rods, $P = Q$.

For side rods, $P = \frac{0.3WR}{r}$

To determine C_1 and C_2, calculation should be based on a section half way between rod pins.

For transverse bending in rods having knuckle pins flexible transversely,

$$C_1 = \frac{\frac{P}{A}}{1 - \frac{PL^2}{675\,000\,000\,A\,rg^2}}$$

For all other rods,

$$C_1 = \frac{\frac{P}{A}}{1 - \frac{PL^2}{1\,200\,000\,000\,A\,rg^2}}$$

For vertical bending, in all rods,

$$C_2 = \frac{\frac{P}{A}}{1 - \frac{PL^2}{300\,000\,000\,A\,RG^2}}$$

Values for C_1 and C_2 can also be taken from tables in "Kent's Pocket Book" under heading "Merriman's Rational Formula for Columns".

First—

For rods without offset, the larger value of C_1 and C_2 should be taken equal to S.

For rods with offset, the larger value of $C_1 + \frac{Ps}{sm}$ and C_2 should be taken equal to S.

Second—

$$S = C\frac{AL^2r}{SM} + C_1 P\left(\frac{1}{A} + \frac{5}{sm}\right)$$

The calculations should be based on a section located at a distance 0·6L from crosshead pin for main rods, and half way between pins for side rods.

Values of C_1 and C_2

		Revs per min = 265	325	375	420
Main Rod	C =	0·036	0·055	0·073	0·091
	C_1 =	0·500	0·500	0·400	0·300
Side Rod	C =	0·071	0·106	0·142	0·177
	C_1 =	0·500	0·500	0·500	0·500

The coefficients selected should correspond with the highest number of revolutions per minute which the locomotive can make.

If this cannot be determined, use 420 R.P.M. for high speed passenger, 375 R.P.M. for pass. and high speed freight, 325 R.P.M. for all other locomotives.

Very simple rules for rods without offset and having bodies with rectangular section, based on the above theory follow.

First—

Stress is less than one-sixth of ultimate strength of the steel if L is less than 46a or 23b, and if A is more than P divided by one-eighth of ultimate strength

Second—

$$S = C_2\frac{L^2r}{b} + C_1\frac{P}{A}$$

Values of C_1 and C_2

	Revs per min	265	325	375	420
Main Rod	C_2 =	0·22	0·33	0·44	0·55
	C_1 =	0·50	0·50	0·40	0·30
Side Rod	C_2 =	0·43	0·64	0·85	1·06
	C_1 =	0·50	0·50	0·50	0·50

The allowable stresses for the various sections of rod ends are given in connection with the accompanying diagrams, except where thickness of section is indicated by the letter "b" The figures denote maximum stress allowed under end load P If the minimum areas of the two members differ, take double the lesser area for A.

The minimum area at points indicated by the letter "b" should be:—

For main rods—

$$A = \frac{PX}{30\,000\,b}$$

For side rods—

$$A = \frac{PX}{60\,000\,b}$$

In which X is the average diameter of eye, or average spread of jaw members.

Report of Committee on Mechanical Stokers.

The Master Mechanics' Committee, T. Rumney, Assistant to Vice President, Chicago, Rock Island and Pacific Ry., Chicago, chairman, reported as follows:—

Last year your committee expressed the expectation that this year, judging from the progress which was being made in the development of the mechanical stoker, it would be able to report finally on a few stokers which had then been developed sufficiently to render practically uninterrupted service. Your committee also pointed out that the principal benefit to be derived from the utilization of a perfected stoker fulfil-

ling the requirements specified was the realization of the maximum boiler capacity of locomotives with the ultimate result of increasing their hauling capacity and reducing their cost of operation per ton mile of service renderd.

The actual service performance of two stokers complying with the specifications laid down in last year's report, as developed by extensive enquiry among railways who have heeded your committee's request by lending their aid and installing a limited number upon large locomotives, justifies your committee in now reporting that these two stokers have, in a measure, fulfilled its expectations, inasmuch as the indications are that their service has been sufficiently reliable in practical operation on a large number of heavy locomotives. The stokers are the Crawford underfeed stoker and the Street overfeed stoker.

Both types of stokers in successful service to-day maintain the same general principles in design originally employed. The improvements made on them, which resulted in making their operation practicable, are improvements of detail only, such as would result from the knowledge gained of the weaknesses of individual details brought out by actual service.

The principal benefit to be secured by the application of the mechanical stoker to large locomotives is the realization of the maximum boiler capacity. When three or four years ago the necessity for passenger locomotives and freight locomotives of still greater capacity than those already in service became apparent, they were not generally considered possible without some device to assist in handling the increased quantity of fuel which it was thought these engines would require. The solution of the apparent difficulty, however, was accomplished to a large extent by providing means which reduced the actual fuel requirements of large locomotives. These means are the superheater, the brick arch, improved boiler, better engine proportions, more scientific methods of firing, and better locomotive maintenance. The fact is being more strikingly realized every day that a five per cent. saving in fuel amply warrants the installation of apparatus and the adoption of means which may result in a five per cent. increase in the cost of maintaining motive power.

The net effect of these means as far as the stoker is concerned, in spite of the fact that they tend to increase maintenance expenses, has been to defer, to some extent, the absolute necessity of the stoker as a means on present-day engines to get out of them their maximum capacity. It should not be inferred, however, from this statement that the mechanical stoker does not find application to certain engines in operation to-day especially of the larger Mallet types which are in continuous service on long mountain grades. On the other hand, too, as the greater sustained tractive efforts of the large engine, equipped with superheaters and brick arches, is gradually taken advantage of, its fuel consumption per hour will increase, though decreasing on the ton-mile basis, with the eventual result of possibly making necessary to some extent means, in addition to those already provided, to supply fuel to the engine up to its maximum requirements.

When this condition develops, as it is bound to, by traffic increases, careful investigation of tonnage ratings, and the raising to a higher standard the efficiency of operation, the demand for a perfected type of mechanical stoker will become more acute than ever. It is, perhaps, somewhat of a good fortune that the superheater has stepped in and tided over the difficulty that would have resulted while the stoker was in process of development and the demand for large engines becoming more insistent.

The report then gives a review of the present status of stokers already called attention to, and a brief description of new stokers under process of development.

Generally speaking, your committee feels justified in concluding that decided progress has been made during the last year in the development of the mechanical stoker. While the perfection of the superheater and the brick arch have assisted in making possible a larger engine, it is considered, judging from these indications, that the advent of the perfected mechanical stoker will make possible a still larger engine.

Report of Committee on Safety Valves.

The Master Mechanics' Committee, W. J. Tollerton, Assistant General Superintendent of Motive Power, Chicago, Rock Island and Pacific Ry., Chicago, chairman, and of which W. D. Robb, Superintendent of Motive Power, Grand Trunk Ry., is a member, reported as follows:—

1. The suggestions given below apply to oil and coal burning locomotives, whether using superheated or saturated steam. Safety valves suitable for the requirements of coal burning locomotives should be ample for those burning oil, inasmuch as the enginemen have control of the fire of an oil-burning locomotive to a greater extent than on coal burners.

2. In view of the variation in the various makes of safety valves as regards lift, we feel any formula used for determining the size of safety valves required should take this item into consideration. We do not believe than any change should be made in the formula proposed by the A.R.M.M. committee in 1910, except that the lift and diameter of the valve will be substituted for the area. We, therefore, suggest the following formula, assuming valves have 45 degree seat:—

D.—The total of the actual diameters of the inner edge of the seats of valves required.

H.—Total heating surface of boiler in sq. ft. (Superheating surface not to be included.)

L.—Vertical lift of valve in inches.

P.—Absolute boiler pressure in lbs. per sq. in.

$$D = 0.036 \times \frac{H}{L \times P}$$

EXAMPLE.

$$\frac{0.036 \times 2878}{0.1 \times 200} = 5.2'' \text{ diameter}$$

which would require two 3 inch valves.

3. The only accurate method of determining the capacity of safety valves is by actual test in a testing plant, with safety valves fully equipped with springs, as in actual road service. In order that it should be positively known that safety valves will prevent undue raise in pressure under extreme conditions, they should be subjected to a road test.

4. Every locomotive should be equipped with not less than two, and not more than three, safety valves, the size to be determined as per formula in paragraph 2. Safety valves to be set as follows:—

First—Boiler pressure.

Second—Two lbs. in excess.

Third—Three lbs. above second, or five lbs. in excess of first.

5. No metal for valves and valve seats has yet been developed as entirely proof against erosion. Nickel seats and valves are desirable, and an improvement over other metal, but are expensive as to first cost and renewals; therefore, your committee's recommendation is to continue the use of bronze alloys.

6. Manufacturers should be required to stamp on the valve the lift in inches, as determined by actual test, with valve in working condition, and set for a blowback of not to exceed 3 lbs. Your committee recognizes the fundamental importance of valve lift. It, therefore, recommends that in design and manufacture valve lift receive proper consideration.

7. Steam discharge from safety valves of given size can be estimated closely by the use of Napier's rule for flow of steam, as follows:—

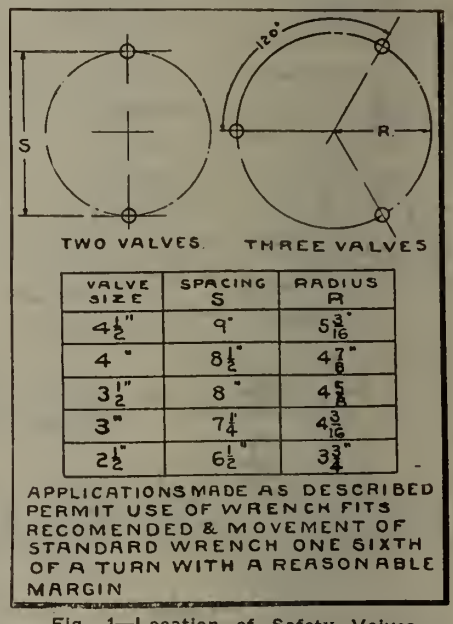
Flow of steam per second.

Absolute pressure in lbs. per sq. in., multiplied by area in sq. in. of discharge opening, divided by 70.

Multiplied by 3,600 gives flow in lbs. per hour.

8. The location of safety valves has much to do with the normal crest of the water in the boiler; therefore, safety valves should be located at the highest point on the boiler, where clearance limits will permit, in vertical position, avoiding the use of piping, long nipples, and ells between safety valves and boiler.

9. Where safety valves are located on an independent dome, they should be spaced as per fig. 1. The opening from boiler into dome and the area between



VALVE SIZE	SPACING S	RADIUS R
4½"	9"	5 3/16"
4"	8½"	4 7/8"
3½"	8"	4 5/8"
3"	7¼"	4 3/16"
2½"	6½"	3¾"

APPLICATIONS MADE AS DESCRIBED PERMIT USE OF WRENCH FITS RECOMENDED & MOVEMENT OF STANDARD WRENCH ONE SIXTH OF A TURN WITH A REASONABLE MARGIN

Fig. 1—Location of Safety Valves.

supporting ribs in dome should not be less than inlet area of valves. If this is not done, the opening will momentarily reduce pressure, causing valve to flutter and hammer.

10. The practice of screwing down the safety valve spring during a hydrostatic test of boiler should be discontinued. Valves with springs designed for certain pressures should not be subjected to extreme pressures. One safety valve should be removed and replaced with a special high-pressure valve, and the other valves should be removed and replaced with caps or plugs during test.

11. In order to make valves of different manufacture interchangeable, recommend standard thread and diameter of valves at connections as follows:—

2½ in. safety valve, 2½ in. U.S.S. pipe thread, 8 threads to in.

3 in. safety valve, 3 in. U.S.S. pipe thread, 8 threads to in.

3½ in. safety valve, 3½ U.S.S. pipe thread, 8 threads to in.

4 in. safety valve, 4 in. U.S.S. pipe thread, 8 threads to in.

4½ in. safety valve, 4½ in. U.S.S. pipe thread, 8 threads to in.

Value of above dies to be made for U.S.S. wrench, fit 12. As it has been found that the conditon of the safety valve springs greatly affects the discharge capacity of the valve, oil springs should be tested as to their deflection under load before being used in repaired valves.

13. Safety valves should be thoroughly overhauled and put in good condition whenever the locomotive is in shop for general repairs. Standard gauges should be used, in order that important dimensions may be maintained as originally designed. If this is not done, it generally impairs the efficiency of the valves.

Report of Committee on Train Lighting and Equipment.

The Master Car Builders' Committee, T. R. Cook, Master Mechanic, Pennsylvania Lines, Wellsville, Ohio, chairman, reported as follows:—

Your committee has gone over carefully the suggestions as to recommended practices given in our report to the 1911 convention, and have also given careful consideration to the various points as brought out by the Association of Railway Electrical Engineers' committee on standards at their 1911 convention, and desire to change our suggestions as to recommended practices given in our report of 1911 to read as follows:—

1. That in electrically lighted cars the following voltages should be used:—

60 volts (nominal) for straight storage, head-end and axle-dynamo systems.

30 volts (nominal) for straight storage and axle-dynamo sytems.

2. That each electrically lighted car be provided with a notice giving the following information, and that this notice shall be posted in the switchboard locker.

System—State whether axle dynamo. straight storage, and if used on head-end system.

Type of generator.

Type of regulator.

Voltage of system.

Ampere hours capacity of battery at 8 hour rate.

Number of sets of battery in parallel.

Nominal charging rate....amps. .... max. amps.

Size of train line wires—B. & S.

Number of train line wires—(2 or 3).

Capacity of generator .... amps.

Axle pulley .... in. diam.

Generator pulley .... in. diam.

Length of belt .... ft. .... in.

Wiring diagram (show location and capacity of fuses).

3. That the rules of fire underwriters shall cover all car wiring.

4. That all wiring under car to the switchboard shall be run in conduits.

5. Standard lamps for car lighting service should be in accordance with dimensions as shown on exhibit L.

6. That where train line connectors are used a connector having dimensions as shown on exhibit A shall be used and located as shown on fig. 1, with connections to dynamo, battery and jumper as shown on fig. 2.

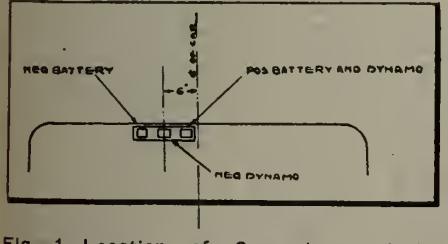


Fig. 1—Location of Connector and Arrangement of Terminals when Facing Car.

(Note: In head-end system, jumper to be placed across negative battery and negative dynamo).

If only two wires are used they shall be connected to the outside terminals and the female connector on each end of the car shall be stencilled: "Not for use on head end system."

7. That each electrically lighted car equipped with batteries shall be provided with two charging receptacles with swivel supports, as shown in detail on exhibits B, C and D, installed one on each side of the car as shown on exhibit E, the outside annular ring to be the positive.

8. That each electrically lighted car shall be provided with a switchboard upon which shall be mounted switches, fused switches or terminals. The switches, fuses or terminals to protect and completely disconnect the following parts:—(a) Train line. (b) Battery. (c) Axle dynamo. (d) Circuits for lamps, fans, etc.

The axle dynamo terminals to control the positive and negative armatures and the positive field of the dynamo. Each of the above switches, fuses or terminals to be plainly marked, designating the part controlled, the positive terminal to be on the right side facing the board.

9. Where a main lamp switch is used, or where fuses controlling all lamps are used, they shall be so stencilled in plain letters.

10. The switchboard or regulator panels of electrically lighted cars shall be provided with fuses for the protection of the parts given below and with the type of terminal as specified:—

(A) Train Line.—Terminals for reception of flat fuses shall be provided 2½ ins. between centres; stud or screw to be ..... in. diameter, with ..... threads per inch.

(B) Battery.—Optional. Fuse terminals, if fused, shall be same as for train line.

(C) Main Line Switch.—Optional.

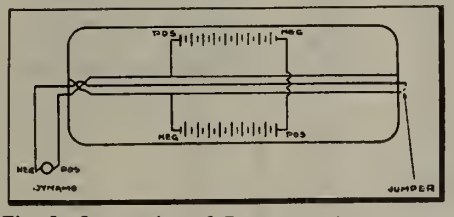


Fig. 2—Connection of Battery to Train Line.

Fuse terminals, if used, shall be same as for train line.

(D) Circuits.—For lamps, fans, etc., fuse shall be of the Edison screw-shell type for both positive and negative.

(E) Axle Generator.—Positive armature fuse terminal; terminals to have N.E.C. code standard 150 amperes knife blade contact clips mounted with 4 in. clearance between clips.

(a) Axle Generator.—Negative armature fuse terminal optional. If used, terminal shall be same as positive.

(b) Axle Generator.—Positive field optional. If used, to have ferrule type clip mounted with 1 in. clear space between clips and to take N.E.C. code standard, 0 to 30 amperes.

Note.—Capacity of fuses, as designated above, to be such as to properly protect the parts in question.

11. That each electrically lighted car equipped with battery box or boxes shall have provided a fuse block, mounted in a suitable metal box at the positive and negative terminals of each set of batteries, and that the fuse block shall be in accordance with the detail as shown on exhibit F, and installed on the car substantially as shown on exhibit E. knife-blade fuses shall be provided with a capacity of between 101 and 200 amperes.

12. That where axle dynamos are used, negative, positive and dynamo field shall be fused as close as possible to the dynamo and prior to the said leads either entering the conduits or being secured to the bottom of the car. The above fuses to be used for emergency service only, and to be at least one hundred per cent. above the capacity of the fuses on the switchboards protecting the same leads.

13. All wires or terminals must be marked for identification.

14. That batteries as a set shall be connected up with a positive pole to the right, facing the car as shown in fig. 2.

15. Where lead storage batteries are used they shall be preferably installed in double compartment tanks substantially as shown on exhibits G, H and I.

16. That where double compartment tanks are used. the connections and arrangements of battery terminals are to be as shown on fig. 3.

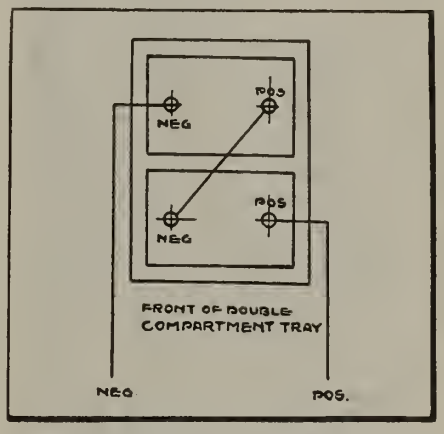


Fig. 3—Connection and Arrangement of Terminals in Double-compartment Tray.

(Note: When Westinghouse hand connectors are used, male head to be used for positive, female head for negative terminal).

17. Battery boxes shall have provided in each door a vent, substantially as shown on exhibit K.

18. That a straight pulley seat be provided for the axle pulley. That if a bushing or sleeve be used, it should preferably be secured to the axle, independent of the pulley. Bushing to have an external diameter of 7½ ins., and to be 8½ ins. long, turned straight. That the pulley hub have a uniform internal diameter of 7½ ins., the length of the hub to be 6½ ins., the face of the pulley to be 9 ins., or wider if flangeless, and 8 ins. if flanged. That the generator pulley be flanged, crowned and perforated, and have a 7 in. face.

19. That when facing the end of the truck on which axle generator is mounted, the pulley or sprocket shall be on the right hand side.

In addition to the above report on recommended practices your committee desire to make the following suggestions to the Association for consideration:—

The adoption of standard size straight axles for different journal sizes for use with axle dynamos. This in view of the adoption of the axle device throughout the country, and the fact that with the present standard tapered axle it is very difficult to properly secure the axle pulley or bushing. The straight axle would result in less maintenance cost in axle pulleys and belts and improvement in service. A number of roads have adopted the straight axle, and if this practice spreads, the diameter of the axle should be standardized in order to minimize the different sizes of bushings or pulleys for car lighting equipment.

The design and adoption of standard arrangement of axle dynamo suspension; the axle dynamo people arranging to provide necessary lugs so that their dynamos will be applicable to the M.C.B. standard suspension. This suggestion is made in order that a safe suspension may be provided for all equipment and that the generators as manufactured by the various manufacturers will be interchangeable.

If the train lighting committee is con-

tinued, the committee would like to be advised as to whether or not it is desired that they include in their investigation recommended practices as to maintenance and repairs of batteries and other electric car lighting apparatus, and maintenance and repairs of axle generators.

Report of Committee on Steel Tires.

The Master Mechanics' Committee, of which L. R. Johnson, Assistant Superintendent of Motive Power, C.P.R., Montreal, is chairman, reported as follows:—

Since the last convention, your committee, which was continued with a view to presenting a specification from which railway companies could purchase tires, with confidence that they would give the service expected, have worked to that end, and although it would be impossible to construct a specification every clause of which would meet with every member's ideas, and also fill in detail all the ideas of every member, we feel we have a good working specification, which, if followed by the manufacturers, will produce tires which will give satisfactory service on any road on this continent. It is a little longer, perhaps, than we would have liked; at the same time, we hardly see where we can shorten it, and get the results required.

Recognizing the importance of a drop test, we have gone to considerable trouble in getting the very best practice of the old and new worlds, but clause 8 leaves it optional with the railway companies to demand or not as they wish. The rules for the drop test have been drawn up with the idea of utilizing as far as possible the drop test machines already in use for other purposes, and so sparing the manufacturers the expense of making special one for tires.

SPECIFICATION FOR STEEL TIRES.

1. MATERIAL.—Stock for tires shall be made by the open hearth or crucible process.

2. CLASSES.—There will be three classes of tires for the different classes of service, as follows:—

Class 1. Driving tires for passenger engines.

Class 2. Driving tires for freight engines.

Class 3. Driving tires for switching engines, and tires for engine truck, tender truck, trailers and car wheels.

3. CHEMICAL COMPOSITION.—

Class 1. Carbon not less than 50% or over 70%.

Phosphorus, not over .05%.

Manganese, between 50% and 80%.

Sulphur, not over .05%.

Class 2. Carbon, not less than 60% or over 80%.

Phosphorus, not over .05%.

Manganese, between 50% and 80%.

Sulphur, not over .05%.

Class 3. Carbon, not less than 70% or over 85%.

Phosphorus, not over .05%.

Manganese, between 50% and 80%.

Sulphur, not over .05%.

4. FINISH.—The tires must be free from defects of any kind, and finished tires must be accurately machined to the prescribed dimensions of the Master Mechanics' standard, and rough tires must not be outside the limits of the attached prints.

5. BRANDING.—The tires shall be distinctly stamped when hot with such brands as the purchaser may require, and in such a manner that the marks shall be legible when the tires are worn out.

6.—SAMPLES FOR CHEMICAL ANALYSIS.—Drillings from a small test ingot cast with the heat, or turnings, from a tensile specimen, or turnings from a tire (where tires are machined at the works of the manufacturer), shall be used to determine whether the chemical composition of the heat is within the limits specified in paragraph 3. When required, the purchaser or his representative shall be furnished an analysis of each heat from which tires are made.

7. PHYSICAL PROPERTIES.—The steel for the different classes of service shall meet the following minimum physical requirements:—

Class (a)—Tensile strength, lbs. per sq. in., 105,000; elongation per cent. in 4 ins., quotient of 1,556,000 divided by the tensile strength.

Class (b) Tensile strength, lbs. per sq. in., 115,000; elongation per cent. in 4 ins., quotient of 1,300,000 divided by the tensile strength.

Class (c)—Tensile strength, lbs. per sq. in. 125,000; elongation per cent. in 4 ins., quotient of 1,150,000 divided by the tensile strength.

8. FALLING WEIGHT TEST.—Should the contract call for a falling weight test, a test tire from each heat represented shall be selected by the purchaser or his representative and furnished at his expense, provided it meets the requirements.

8a. The test tire shall be placed vertically under the drop in a running position on a spring foundation with an anvil of at least ten tons weight, and shall be subjected to successive blows from a tup weighing 2,000 lbs., falling from heights of 5 ft., 10 ft., 15 ft., and 30 ft., and upwards, until the required deflection is obtained as specified in paragraph 8b.

8b. The test tire shall stand the drop test described in paragraph 8a without breaking or cracking, and shall show a minimum deflection equal to X in the following table:—

Internal diar. of tire (=d) Thickness of tire (=t).	Class 1. Tensile breaking strength per sq. in. 105,000 lbs.	Class 2. Tensile breaking strength per sq. in., 115,000 lbs.	Class 3. Tensile breaking strength per sq. in., 125,000 lbs.
3 ft. dia. and over	$\frac{3\,d}{6\,t}$	$\frac{3\,d}{10\,t}$	$\frac{3\,d}{12\,t}$
Under 3 ft. diar.	$\frac{3\,d}{10\,t}$	$\frac{3\,d}{12\,t}$	$\frac{3\,d}{14\,t}$

8c. A specimen for the tensile test is to be taken from a tire that has been subjected to a falling weight test, and it shall be cut cold from the tested tire at the point least affected by the falling weight test. The tensile test specimen when cut from a tire that has been subjected to a falling weight test shall be cut normal to the radius and parallel to the face.

8d. Should the test tire fail to meet these requirements in any particular, two more test tires shall be selected from the same heat if the manufacturer so desires, and at his expense. Should these two tires fulfil the requirements, the heat shall be accepted.

9. INSPECTION.—The inspector representing the purchaser shall have free entry to the works of the manufacturer at all times while his contract is being executed. All reasonable facilities shall be afforded to the inspector by the manufacturer to satisfy him that the tires are being furnished in accordance with the specifications. All tests and inspections shall be made at the place of manufacture prior to shipment, and shall be conducted so as not to interfere unnecessarily with the operations of the mill.

Tires must be rolled in accordance with the best practice, sufficient metal being discarded to insure sound tires. The tire taken from the bottom of the ingot must be stamped with the letter A before the tire number, the next above B, and so on up the ingot.

Tensile test specimens, one from each heat, must be forwarded to the engineer of tests of the railway company, together with a copy of the chemical analysis of each heat, showing the tire numbers rolled from each heat; also destination of each tire, together with the railway company's purchasing agent's order number. If, however, the manufacturer is rolling tires right along for the railway company, and its inspector is at the plant, the test specimens from heats ready at that time may be pulled at the manufacturer's plant by the inspector and the broken test pieces sent in for analysis, in which case the above information must be furnished the inspector.

An analysis of the test pieces made by the railway company's test bureau must agree with that furnished by the manufacturer, and with an analysis made from turnings from the tires after received; a failure to agree within reasonable limits will be cause for rejection.

In addition to the above tests, the railway company reserves the right to make a repetition of any tests to make sure that only material meeting all the requirements set forth in this specification be accepted, and all material found not up to any one or all of these requirements will be rejected.

Samples representing rejected material will be retained in the test bureau not longer than thirty days from date of test. If at the end of that period the sellers have not signified their desire for a rehearing, it will be understood that they agree with the results as reported. If by this time the sellers have not given shipping directions for material rejected at destination, the material represented by the samples will be returned to them at their risk, they paying freight both ways.

Increased Power Obtained with Superheat.

C. H. Benjamin, Dean of the Schools of Engineering, and L. E. Endsley, Professor of Railway Mechanical Engineering, Purdue University, Lafayette, Ind., presented the following report of progress:—

It is with regret that we have to say that we are unable at this time to make a full report upon the results obtained on the Purdue locomotive in regard to the increased power obtained with superheated as compared with the maximum power obtained with saturated steam. This is due to the fact that laboratory conditions were such that all the tests of the series could not be completed until so late a date that sufficient time was not available to make a full report.

It was thought worth while, however, to make some statement in regard to the progress of the work, and, in a general way, to indicate to what extent the power of the locomotive was increased by the installation of a Schmidt superheater, which gives a rather high degree of superheat.

It will be remembered that the work reported upon for the last three years was a comparison between the efficiency of the locomotive when using, first, saturated steam, and then superheated steam, while developing approximately the same amount of power under both conditions. When the maximum power was obtained upon the locomotive, while using saturated steam, it required the burning of from 120 to 130 lbs. of coal per sq. ft. of grate area per hour, whereas when superheated steam was used, and when approximately the same power was developed, only from 85 to 90 lbs. of coal per sq. ft. of grate area were burned. This difference in the amount of coal burned while operating with saturated and superheated steam, respectively, is due to the fact that about 25% saving was made in the amount of coal burned.

The work this year has consisted in increasing the power by increasing the cut-off by small increments in an en-

deavor to burn the same amount of coal per sq. ft. of grate area per hour, as was done while using saturated steam. While we have not increased the cut-off to such an extent as to make this possible, it is apparent that there will be no great difficulty in burning the same amount of coal. When these tests are completed, it can then be determined to what extent the power has been increased and by what amount the efficiency has been affected. It is evident that if this increase in the amount of coal burned can be effected without decreasing the efficiency of the locomotive, the per cent. of gain in power will be even greater than the per cent. of gain in the efficiency of the locomotive when using superheated steam than when using saturated steam. The tests made so far, however, indicate that there is a slight decrease in efficiency with increased burning of coal, so that a gain of not more than 20 or 25% in power may be anticipated.

Flange Lubrication.

The Master Mechanics' committee, of which M. H. Haig, Mechanical Engineer, Atchison, Topeka and Santa Fe Ry., is chairman, reported as follows:—

In preparing last year's report an effort was made to determine to what extent the railways were troubled with flange wear; to describe the methods and devices for applying lubricant to flanges; and to record the effectiveness of lubrication in overcoming flange wear. Having presented its conclusions as based on information available at the time the former report was closed, the committee feels that its further duty lies in recording the development in flange lubrication during the past year; the increase or decrease in the application of flange lubrication; as well as in reporting the further actual experience of the various railways, thereby confirming or refuting its previous report.

Some of the railways which have already made service trials have satisfied themselves as to the effectiveness of flange lubrication. They do not feel justified in going to the expense of still further tests to provide data for additional information. Having determined that lubrication is reducing flange wear and proving economical, they are proceeding with the application of flange lubricators and consider the experimental stage to have been passed.

As but little further information seemed available from formal tests, a consensus of opinion was sought through replies to a set of questions distributed to all members, through the Association's Secretary. The report is, therefore, a compilation based on the experience of various railways and does not represent merely the opinion of a single committee or single individual.

Since closing the 1911 report advice has been received of flange lubricators having been applied by over 30 railways on which lubricators had not been used previously. In most cases reported, the number of locomotives equipped on each road has been small. In one instance, however, a road operating over 1,100 locomotives has applied flange lubricators to the entire number. On a number of other railways on which flange lubricators were used at the time of preparing the last report, the application has since been extended. The reports of 35 of these roads show an average increase of 30 lubricators each, the number per road varying from one to over 200.

An affirmative answer to the question "Does your experience confirm the report on flange lubrication presented at the last convention?" was received from 23 of the 29 roads replying in detail to the committee's circular. Five of these roads explained that failure to answer was due to lack of sufficient experience.

Among these railways on which lubricators have been used, no cases have been reported where flange lubrication has been abandoned. A number of roads has removed certain types of lubricators applied experimentally and replaced them by others. The types of lubricators applied during the past year indicate the most general adoption of crude oil as a lubricant. Some reports state that hard grease has been rejected as unsatisfactory due to the fact that the grease catches and holds sand. The abrasive action resulting has increased instead of decreased the flange wear. Graphite as a flange lubricant has been reported as successful by some roads, but others have abandoned it for crude oil. Crude oil with a heavy asphaltum base is spoken of with the greatest favor by roads using flange lubricators. It has been successfully applied by both hydrostatic and gravity feed devices.

Exhaust steam from air pumps as well as water jets are still being used to a limited extent by some railways, and beneficial results are reported. An undesirable feature of the water jet is the fact that it must be abandoned during the winter weather.

A type of lubricator especially adapted to electric locomotive service has been developed on the Grand Trunk Ry. by W. D. Hall, Superintendent of Power Plant and Electrical Equipment, St. Clair Tunnel, to meet the requirements of service through the tunnel. Fig. 1 shows the principle by which this lubricator is connected and operated. Oil is contained in an airtight receptacle of one quart capacity. The oil is led to the wheel flanges by pipes and is sprayed upon the flanges by jets of air. The air is supplied from the main reservoir by a ¼ in. pipe connected to the oil receptacle above the surface of the oil. This provides a pressure to force the oil from the receptacle. A branch of this pipe is connected to the oil delivery pipe leading to the flanges. The oil is thus forced through the pipes and sprayed upon the flanges. Used with electrical equipment, the air is controlled by an electric push button. Valves admitting air above the surface of the oil, as well as to the delivery pipes, are operated by electro magnets. The push button is located in easy access of the engineer and oil is sprayed upon the wheel flanges almost immediately upon the admission of air pressure. With this arrangement flange lubricant is applied only when needed, and when running on straight track the lubricator is not continued in operation.

This apparatus has been in successful operation since July 10, 1910, and has operated under extremely severe conditions. Six electric locomotives have been equipped and handle 1,000 ton trains up and down 2% grades. Owing to the many curves encountered, and also because of the rather low centre of gravity of the locomotive, flange wear has been quite heavy. Since applying this lubricator the conditions have been improved to such an extent that 50,000 miles and over are made between turnings, and it is seldom necessary to remove wheels for tire turning before the armature is removed for commutator dressing, and these two operations may, therefore, be performed at the same time. Before the application of the lubricator, mileage made between tire turnings was from 12,000 to 25,000. The lubricant used is engine oil, most of which is taken from bearing cellars of the railway armatures when the oil in them is being changed. The oil is filtered before being applied to the flange lubricators. No difficulty has been experienced with the delivery of this oil in cold weather. It is sometimes thinned to suit the weather conditions by the addition of a little coal oil. Care has been exercised in keeping the oil free from anything that might obstruct the nozzle, and very satisfactory results have been obtained under varying and severe weather conditions.

Fig. 2 shows the application and principle of operation of an air operated flange lubricator for electrical equipment, manufactured by the makers of a hydrostatic flange lubricator for steam locomotives. The lubricator is located in the cab, as with the hydrostatic device, and sight feeds indicate the rate of formation of the drops of oil. An electrical heater is included in the equipment, and the temperature of air and oil is raised by passing through this heater. The air supply is from the main reservoir. Oil is led to wheel flanges by pipes as with the hydrostatic lubricator and is sprayed upon the flanges by air instead of steam. This lubricator has been placed on electric locomotives of the Baltimore and Ohio and the Pennsylvania Railroads.

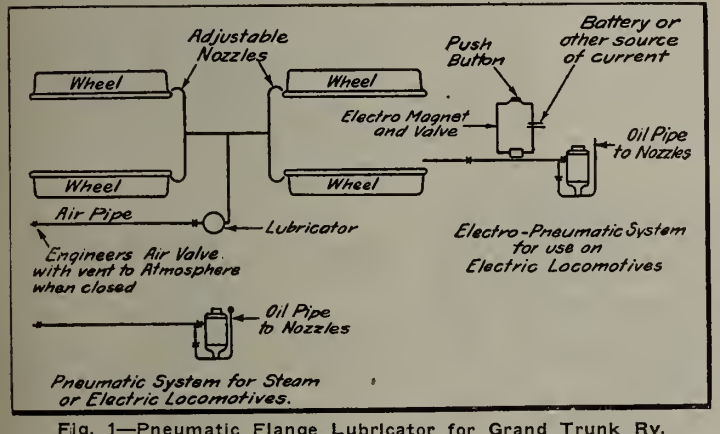


Fig. 1—Pneumatic Flange Lubricator for Grand Trunk Ry. Electric Locomotives.

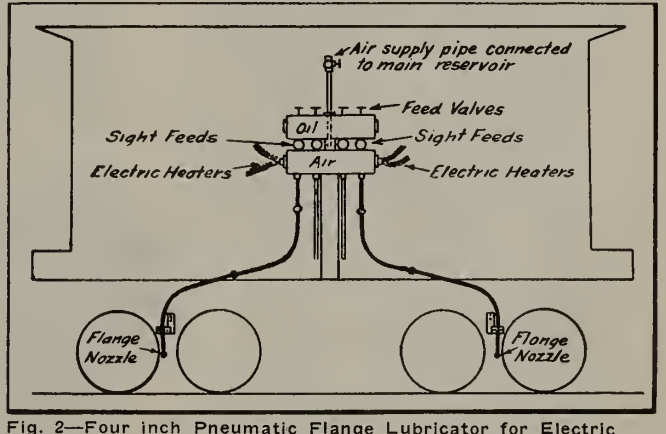


Fig. 2—Four inch Pneumatic Flange Lubricator for Electric Locomotives.

The Collins flange lubricator illustrated and described in the former report has since been improved. The improved device is similar in construction to that already described. The feeding device of the original type was placed under the body of the lubricator. The lubricating block of graphite composition was pressed against the flange by a pawl engaging in notches in the under side of the block. With the improved type a coil spring and plunger acting directly behind the block of lubricant presses it against the flange, the feed being continuous without adjustment until refilling is necessary. The 1911 report has given the impression that this lubricator was designed to use hard grease. The lubricant is graphite.

Among the simple devices operated by some of the railway companies is one which can be built up of pipe fittings and has been used to appiy either hard grease or graphite. The device consists of a short section of 1¼ inch pipe capped at one end and containing a piston actuated by a spiral spring. A small rod threaded into the piston extends through the cap, not only assisting to guide the piston, but also indicating the amount of grease in the lubricator. This device is clamped to the frame of the locomotive in front of the drivers and feeds the lubricant directly against the flange. When using ordinary rod grease the lubricant is contained in a section of scrap rubber hose and is deposited as the hose is worn away. The Pittsburgh and Lake Erie Rd. has applied this lubricator extensively, using a mixture of paraffin and graphite as the iubricant. This is contained in a wooden block turned up in a lathe, the cavity for the grease being bored out 1 inch in diameter. The Pittsburgh and Lake Erie applies a lubricator to each wheel which has shown wear or cutting. After the flange has been worn smooth it has not been considered necessary to operate the iubricator until further signs of cutting develop. Some difficulty has been reported as to keeping this device in proper adjustment at ail times.

The result of a test of flange lubrication on a number of 12 wheel locomotives of the Norfoik and Western Ry. was given in the 1911 report. This test led to the conclusion that with track conditions as existing on this line, flange wear was too slight on freight engines to warrant the practice of lubrication. Five Pacific type passenger engines have since been equipped with lubricators for test purposes. The equipment includes three types of lubricators —hydrostatic, gravity and graphite. The comparative mileage between front tire removals before and after the application of the lubricators is shown in table I. It will be seen that the average service per front tire removed from these engines before the lubricators were applied was 16,518 miles, while the average for the same engines since the lubricators were installed has been 39,909. The former figures are taken from the record of 25 tires removed, the latter from the record of 10 tires removed. The local authorities providing the data suggest that this result may have been affected in some measure by a laterai spring arrangement applied to the trailer trucks to prevent nosing. They state, however, that they consider the improved condition to be due to lubrication and not to the spring.

TABLE 1.

Mileage after equipped with oilers.

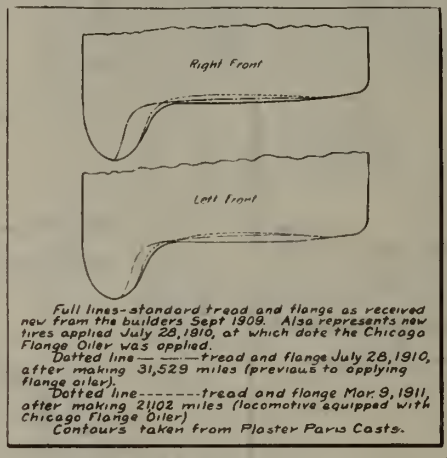
Eng.	Right Side.	Left Side.
564	63,141	63,141
Average miles per tire, 63,141. Tires removed, 2.		
569	27,889	27,889
569	39,582	39,582
Average miles per tire, 33,735. Tires removed, 4.		
571	26,728	
571		43,512*
Average miles per tire, 35,120. Tires removed, 2.		
572 No tire renewals since oilers applied.		
573	33,816	33,816
Average miles per tire, 33,816. Tires removed, 2.		
Average miles per tire, all engines, 39,909.		

Mileage before equipped with oilers.

Eng.	Right Side.	Left Side.
564	26,702	26,702
Average miles per tire, 26,702. Tires removed, 2.		
569	13,175	13,175
Average miles per tire, 13,175. Tires removed, 2.		
571	17,204	17,204
571	6,845	6,845
571	12,096	12,096
571	16,784	
Average miles per tire, 12,725 Tires removed, 7.		
572	15,846	15,846
572	24,553	24,553
572	24,297	24,297
572	14,640	14,640
Average miles per tire, 19,834. Tires removed, 8.		
573	17,972	17,972
573	15,618	15,618
573	9,139	9,139
Average miles per tire, 14,243. Tires removed, 6.		
Average miles per tire, all engines, 16,518.		

*Includes four months mileage before oiler was applied.

Fig. 3 shows the contour and mileage records of a decapod locomotive on the Buffalo, Rochester and Pittsburgh Ry. Previous to the application of the lubricator this engine had made 31,529 miles with the flanges worn as shown by the dot and dash contour lines. After making 21,102 miles with a hydrostatic oiler in service, the condition of tires was as shown by the dotted contour lines.



Full lines-standard tread and flange as received new from the builders Sept 1909. Also represents new tires applied July 28,1910, at which date the Chicago Flange Oiler was applied.
Dotted line — — —tread and flange July 28,1910, after making 31,529 miles (previous to applying flange oiler).
Dotted line-------tread and flange Mar.9,1911, after making 21102 miles (locomotive equipped with Chicago Flange Oiler)
Contours taken from Plaster Paris Casts.

Fig. 3—Contours taken from a Decapod Locomotive, B. R. and P. Ry.

The Hocking Valley Ry. reports that the service of switch engines operating upon industrial tracks with much sharp curvature has been increased from 4 to 12 months. On consolidation engines subject to excessive wear of front and back flanges, the service of tires has been increased from 1 to 2 years. At the end of this period the flanges are still in good condition.

Table 2 shows the estimated saving in cost of tires effected by the use of flange lubrication on the St. Louis and San Francisco Rd. This is based upon experience with consolidation engines equipped with hydrostatic oilers using asphaltum oil.

TABLE 2.

Value of new 56-in. tire, 3½ ins. thick....	$30.80
Less scrap metal in tire	2.45
Net value of wearing metal	28.35
Net value per sixteenth, figuring on 28 sixteenths, wearing metal	1.01
Average loss of metal account flange wear after one year's service if tires have been changed three times	9-16 in.
Average tread wear	5-16 in.
Average loss of metal account flange wear 4-16 in. 4-16 in. at $1.01 per sixteenth	$ 4.04
Loss on consolidation engines, eight tires at $4.04 each	32.32
Cost of changing tires three times.....	70.80
Total loss account flange wear	$103.12
Deduct—	
455⅝ gallons oil at 50 cents	$22.81
Storehouse expense and cost of handling flange oil	2.28
Interest on flange oiler and material used in equipping engine	5.40
Total deductions	30.49
Net saving per consolidation engine equipped with oiler per year	$72.63

Comparative mileage of two classes of locomotives of the Queen and Crescent Route is shown in Table 3.

TABLE 3.

Consolidation Type.

Before.		After.	
701	22,855	705	44,387
703	18,293	707	43,230
706	16,211	712	51,255
704	26,026	716	45,344
709	25,755	720	42,205
716	25,246	721	43,352
717	24,273	726	40,340
732	18,897	729	44,226
736	24,823	733	42,394
737	27,961	737	43,738
Total	230,335	Total	440,471
Average	23,033 miles	Average	44,047 miles

Pacific Type.

Before.

800, 11-1908 to 6-1909	36,154
801, 12-1908 to 6-1909	19,743
802, 12-1908 to 7-1909	46,466
803, 11-1908 to 8-1909	56,722
	159,085

39,771, average before flange oilers.

After.

800, 6-1909 to 10-1910	76,890
801, 6-1909 to 10-1910	96,918
802, 7-1909 to 11-1910	96,470
803, 5-1910 to 9-1911	97,137
	367,415

91,854, average after flange oilers.

Several roads report a noticeable reduction in tender truck wheel flange wear on engines equipped with lubricators. However, no data have been received to show the extent of reduction or influence upon wheel mileage. The information received by the committee is shown in table 4.

TABLE IV.

Railway.	Tender Wheels.	Rails.
Queen & Crescent Route	Wear reduced	Wear reduced
Ulster & Delaware	Wear reduced	No statement
Norfolk & Western	No statement	*
Buffalo, Rochester & Pittsburgh	No statement	*
Hocking Valley	No statement	No statement
Wheeling & Lake Erie	No statement	*
Colorado & Southern	Wear reduced	Wear reduced
Chicago, Burlington & Quincy Lines West	No statement	Wear reduced
Union Pacific	No statement	No statement
Duluth & Iron Range	No statement	No statement
St. Louis & San Francisco	Wear reduced	Wear reduced
El Paso & Southwestern	No statement	No statement
Santa Fe System	Wear reduced	Wear reduced
Canadian Pacific	No statement	No statement
Grand Trunk	No statement	No statement
Washington Terminal	No statement	Wear reduced
Baltimore & Ohio	No statement	Wear reduced
Terminal Railroad Association of St. Louis	No statement	No statement
Mfrs. Ry. Co. of St Louis	No statement	Wear reduced
Southern Pacific	Wear reduced	Wear reduced
Lake Shore & Michigan Southern (with associated roads)	No statement	Wear reduced

The number of lubricated engines in service is relatively too small to have any noticeable effect upon track.

The question of saving in rail renewals and decreased train resistance to be realized from lubrication of rails on curves has been carefully investigated by the Pennsylvania lines west of Pittsburgh. Tests to determine the reduction in rail wear to be obtained by lubrication were made on curves 3° 20' and 10° respectively. The rails on the first half of the curve to be traversed were not lubricated, and those on the last half were lubricated by hand. The following is quoted from the conclusions of the Pennsylvania committee: "The data collected shows that with lubrication there would be considerable saving in rail and flange wear on roads with sharp curvature . . . Our tests confirm a saving, but show that for light curvature the saving is very little. The tests show very little more wear on curves up to 4° than on straight line."

Records of rail renewal on the South-

ern Pacific in the Sierra Nevada Mountains, where all of the locomotives are equipped with flange oilers, show that since the oilers have been in service the average life of the outside rail on all curves above 5° has been increased from 12 to 32 months, or 2 2-3 times the life prior to the use of flange oilers. The average life of the inside rail on curves above 5° has been increased from 13 to 33 months, or 2½ times the life prior to the use of the oilers.

In this connection it should be stated that rails are now removed having a much smaller percentage of wear than those removed a number of years ago. In other words, rails which are now considered unsafe for traffic, a number of years ago would have been allowed to remain in the track several months longer. Keeping this in mind, the above figures, which have been abstracted from curve-worn rail reports, will be seen to be conservative.

Attention should also be called to the increase in average daily tonnage. The flange oilers have been in general use on the territory under consideration since May, 1908. For three years prior to that date the average daily tonnage passing over these curves was approximately 15,000 tons. For the three years since that date the average daily tonnage has been 22,000, an increase of 47%. The increase in tonnage should increase the rail wear, and in order to get at the actual increase in the life of the rail since flange oilers were put into use, this factor should be taken into consideration. Had the average daily tonnage remained 15,000 tons instead of increasing to 22,000, the rail would have lasted 47% longer than it did, or practically 48 months. This is nearly four times as long as the life of the rail prior to the use of flange oilers, considering conditions to have been the same in both cases.

The experience of other railways in reducing rail wear is given in table 4. No data are available to show the extent of reduction, but in several cases it has been noticeable.

Any agency whereby the wear of rail and flanges is reduced may be expected to affect train resistance on curves. This has been observed in the ease with which lubricated engines round curves, but it has not been of sufficient effect to lead to any increase of tonnage rating. It must be considered that the effect of lubricant applied to the flanges of the locomotive drivers decreases very rapidly with increased distance from the locomotive.

The committee of the Pennsylvania lines, already referred to, continued its tests to determine the effect of flange lubrication on train resistance. A series of runs was made on a division with a grade northbound of 90 ft. per mile and 60 ft. per mile southbound. About two-thirds of the track over the summit is made up of curves from 2° to 6° 45'. The trains were hauled by a consolidation locomotive. The drawbar pull of runs made with oil lubrication applied to two pair of drivers and the truck wheels, and the runs with graphite applied to the gauge side of the rail by brushes, was compared with the drawbar pull without lubrication. Northbound the trains consisted of the dynamometer car and 29 empty cars weighing about 605 tons. Southbound the trains consisted of the dynamometer car and 13 loaded cars weighing from 915 to 951 tons. The tests showed a reduction in drawbar pull with a loaded train of 951 tons, of 285 lbs., or about one-sixth of the drawbar pull for one loaded car. The reduction for empty cars was equal to about one and one-half cars. The tests were not considered conclusive, however, on account of variable weather.

A similar set of test runs was made over another piece of track as nearly level as could be found, with curves from 2° 49' to 9° 59'. This was selected in order to eliminate, as far as possible, any resistance due to grade. The tests showed fairly uniform results and that there was slight decrease in curve resistance due to lubrication, but not sufficient to allow of another car being added to the train.

It is the practice of many roads, where curves occur on grades, to compensate for the curvature by reducing the grade. Where this practice is followed no decrease in curve resistance can affect tonnage rating.

The flange lubricator, like other devices, requires attention. Any defects or any imperfections in the device or its connections should be included by the engineer in his work report at the end of his trip. This work should be done by the roundhouse force and the roundhouse should be held responsible for repairs.

Engine crews should be held responsible for the performance of the lubricators, and where repairs are maintained by the roundhouse, the lubricators require comparatively little attention. In view of the economy in life of tires when flanges are properly lubricated, road foremen of engines should see that lubricators are kept in operation on the engines under their jurisdiction.

With oil as a lubricant the delivery nozzle should be properly adjusted and maintained to direct the oil against the flange of the wheel. If the oil is not deposited on the flange it results in no benefit as a lubricant. If directed toward the tread it will run down to the rail when the engine is standing, and where the nozzle is forward of the wheel, this is apt to cause slipping when starting.

To avoid this, as well as to get away from the sand pipe, the delivery nozzle is often placed at the rear of the wheel. With the hydrostatic lubricator there is a certain objection to this location. On an engine equipped with the Stephenson link motion, the space just back of the first pair of wheels is often the opening through which the engineer reaches in oiling around. With the delivery nozzle located back of the first wheel there is sometimes sufficient steam in cold or wet weather to cause annoyance.

When placed forward of the wheel a good location is just opposite to the top frame rail. This should be far enough from the delivery end of the sand pipe to prevent water of condensation from collecting at the end of the pipe and freezing.

In severely cold weather care should be exercised to prevent water of condensation from freezing in the delivery pipes of the hydrostatic lubricator. By keeping a sufficient flow of steam through the pipes this should be avoided. This steam can be throttled sufficiently to keep the pipes clear without emitting so much steam as to be annoying.

Considering the previous report and the information upon which the present report has been based, your committee feels justified in the following conclusions:—

The value of flange lubrication depends upon local conditions.

Flange lubrication has proven effective as a means of reducing flange wear, particularly on driving wheels.

The effect of lubricant applied to driving wheel flanges decreases rapidly as distance from locomotive increases.

Flange lubrication results in considerable saving in rail wear when sharp curves are frequent.

The effect of flange lubrication upon train resistance is not sufficient to make it a factor in tonnage rating.

The Canadian Northern Ry. hotel at Brandon, Man., which has been named the Prince Albert, was opened June 1.

Report of Committee on Overhead Inspection of Box Cars.

The Master Car Builders' Committee, A. Kearney, Assistant Superintendent Motive Power, Norfolk and Western Ry., Roanoke, Va., presented a report, of which the following is an abstract:

In an endeavor to formulate methods and practices for the prevention of losses it is not always certain what proportion of the resulting damage belongs to the condition of the car, the manner in which the packages are made up for shipment, method of packing and stowing away in the cars, rough handling and the shrinkage incidental to the method of transportation. All these conditions carry responsibilities.

A very important consideration is the ability to readily secure the necessary supply of equipment in the event of more stringent and specific rules being established for the selection of cars, separating them for certain commodities. Any further restrictions might result in diminishing the opportunity of readily supplying sufficient equipment, and might prove disastrous to the degree of almost causing a cessation of traffic locally. The need of some form of easement of the difficulty is shown by the extent of the freight losses and damage per annum, which from 1900 to 1910 increased in the United States from $7,055,622 to $21,756,671, exclusive of the enormous clerical work involved and the loss of time to the public. The Committee of Relations of the American Railway Association, from inquiries made among numerous roads, computes that the loss from defective cars alone amounts to $139,194, of which $51,919 can be traced to leaky cars. This is for a series of roads having a total gross earnings for the year of $259,061,997.

Closer inspection, involving increased cost for repairs, leaves an open question as to how much extra expense would be justified to overcome the claim losses due to defective equipment. There are two open avenues through which improvement can be directly approached: 1. Concentrate responsibility for losses due to defective car bodies in such a manner as to provide an automatic incentive for the use of better cars. 2. Establish standard requirements for inspection of car bodies.

The General Managers' Association of the southeast has been giving considerable attention to the subject of freight losses and damage, and the feature of defective car bodies has been under consideration, the results of the investigations of the committees formed by this association being embodied briefly in what follows.

DEFECTIVE CARS.—Scarcity of cars has almost compelled the use of defective cars, but which are kept running so long as the running gear is in good condition. These cars ought to be inspected more closely, and if the roof and sides be found defective, have them placarded "Not to be loaded with freight that could be damaged by rain," and have them loaded with non-destructive freight and directed homeward for such repairs as are necessary to again permit them to go into service. This suggestion was unanimously adopted.

This was followed up by correspondence in various directions, which led to the conclusion that the rules of the Freight Claim Association in loading the losses on the several lines that participated in the haul were not conducive to the best results in the maintenance of the rolling stock in good condition, as the loading line is relieved of a large part of the burden, although initially responsible for the loading of the defective car. The General Managers' Association resolved that all the responsibility for loss and damage from defective car roofs and bodies be centred

on the loading line, causing the latter to produce clear and positive evidence of the car having been properly inspected and found all right in order to clear itself from the responsibility. The Freight Claim Association failed to act on this, but at a joint meeting of the freight claim agents of three of the Atlantic seaboard organizations, substantially the same resolution was passed.

END WINDOW.—The General Managers' Association also adopted a resolution that in view of the small use of end windows in cars, and the fact that they afford easy access for thieves, admit rain, cinders and dirt, with consequent damage to the car contents and to a certain extent destroy the effectiveness of seal records, that the use of them be discontinued except where the traffic demands otherwise.

PROTRUDING NAILS AND BOLTS.—A committee of the same association as the result of an investigation, found on 730 cars examined, that there was an average per car of 40 nails projecting, 1½ bolts projecting and 25 nails bent down. The bigger proportion of the nails were below the belt rail. As a result of this investigation, most of the member lines issued circulars covering the preparation of the cars prior to loading, which called for the removal of all nails, the covering of the heads of protruding bolts with bagging and the thorough cleaning of the cars for the reception of the loading, by covering the floor with sawdust or clean dirt If the flooring has been penetrated with oil or similar damaging fluids.

LEAKY ROOFS.—Of 52 box cars examined at one point, 45 were found to be leaking, 38 through the roof and seven through the sides only. There were 152 leaks in the roof, or an average of 4 per car. At another place, a divisional point, the cars that passed through in a 10-day period were examined, and out of 702, 467 or 66% were found defective, 106 of these having a leaky roof. The defective cars had from 1 to 33 cracks or openings in the sides, ends and doors.

INSPECTION CARDS.—Another committee of the same association recommended the use of cards stating the exact condition of the car at the time of loading. The Frisco Lines have used such a card with a great degree of success. The card has printed on it in large letters "Flour," with some additional matter respecting the fact that the car had been inspected, in smaller type at the bottom. This card is used for tacking on the sides for various commodities such as cotton piece goods, grain, plaster, sugar, rice, etc., that would be injured by water, the word "flour" being used to cover all these materials. The use of the card on the Frisco lines carries with it an understanding between the railways and the mills and other shippers, that they must not load a car with flour or other mill products unless that car is labelled with one of these cards. When loaded, the card is removed and turned into the agent to be returned with the duplicate bill of lading. and agents are instructed not to sign the bill of lading until the card has been signed by the inspector or the agent's representatives. The card is then filed in the station record, to be produced in the event of a claim being filed for damages. In 1911 the Frisco system paid $43,150 for claims directly traceable to defective equipment, which was 8½% of the total loss and damage to freight handled.

The association sent out cards something along the same line to its members for criticism, which has not as yet been reported upon. The Chicago, Milwaukee and St. Paul Ry. uses a card something similar, with considerable success. The inspection on this line is reported as resulting in the rejection of a large number of cars in the flour and similar carrying lines the percentage of foreign cars running as high as 65, but a rigid inspection like this seems essential to this class of shipments.

The Chicago Great Western Rd. at Minneapolis, where the flour shipments are very large, has introduced a special overhead as well as interior inspection of cars, with satisfactory results. The interior of the car is made perfectly clean, and where the flooring has become oil-soaked or otherwise fouled for flour shipments, the floors are gone over with a coating of quick-drying paint to prevent damage to the loading.

GRAIN LEAKAGE.—It is reported that the Galveston Wharf Co., Galveston, Texas, where considerable grain is exported, made a test inspection of 7,429 cars, which showed that 4,859, or 67%, were leaking grain. Proceeding on this information, the Frisco lines have been experimenting on some means of overcoming this trouble. Grain doors are not entirely satisfactory, from the fact that the sides do not fit up as flush to the door posts as they should from the presence of bent over nails at that place. Experiments conducted with various means of protection led to the adoption of burlap at all leaky places. Eight ounce burlap at 4 cents a yard in 2,000 yard bales is used, it requiring about 15 yds. per car, or about 60 cents, to fully protect the car against grain leakage. Investigation charges on a claim for losses would amount to more than this figure, even if the charge were not sustained. The inside of the grain doors are lined with 8 ft. lengths of the burlap, overlapping the floor at the bottom and hanging over the top, the strips running lengthwise of the car. It is held in place with short wooden strips. The car inspector attends to both the placing of the grain doors and the fastening on of the burlap around the grain doors.

It is no argument to state that in some instances cars are offered in condition unfit for certain classes of commodities, for at the same time it must be remembered that there are numerous shipments made in cars that are in a much higher state of repair than the class of freight being handled would warrant. Therefore, it is possible that if all the cars were raised to the proper degree of excellence for all commodities, there would be an unnecessary expenditure. Guided by the apparent trend, necessities and many conditions surrounding the question of inspection, the committee concludes its report by making the suggestion to the Master Car Builders' Association that box car equipment be divided into three primary grades, designating them according to the classes of freight they are intended to handle. These classifications are as follows:

Classification A. — Freight readily damaged by moisture, such as lime, cement, plaster, flour, sugar, boxed, sack and crated packages of seeds, coffee and merchandise, grain, hay, dry goods and notions, high grades of finished lumber, leaf tobacco, furniture and household goods, and certain grades of tin and galvanized iron.

Classification B.—Freight not readily damaged by moisture, such as raw wool, baled cotton, crated china, agricultural implements, barreled liquids, hides, shooks (knocked down boxes), wagons, carriages, tools, stoves and stove castings, certain grades of lumber, etc.

Classification C.—Rough freight, such as coal, coke, brick, pig iron, slate, tiling, earthenware, pipe, ties, barrel staves and other rough lumber.

METHOD OF INSPECTION BEFORE LOADING. —(a) Inspection to be made at the point of loading whenever practicable, or (b) at point of distribution from which car is forwarded to loading station and again by the agent. (c). Cars received and unloaded at stations where no inspectors are located should be inspected by the agent.

Aside from the M.C.B. inspection of the car, including the roof, running boards, air brakes, safety appliances and running gear, as well as the external inspection of the sides, ends, doors, ventilators and windows, an internal inspection must be made of the roof and siding, with doors, ventilators and windows in closed position:

1. Search for light indicating openings and cracks which might produce leaks.

2. For loose, damaged and broken boards, loose knots, knot holes, bad joints, etc.

3. For all nails and bolts extending above the surface of the floor and lining, and nails protruding through the roofing.

4. Search for water stains indicating cracks and air spaces.

5. Search for cracks sufficient to admit storm-water beating through the opening; also for openings and bad joints around windows and doors.

6. Examine for metal sheets out of position along edge of sub-carlins or down from the edge of the ridge pole.

7. Search for small holes in metal roofs, or small openings in roof from other causes.

8. Doors must operate and close properly.

The floors must be clean, dry and free from defects sufficient to admit moisture and any fouling from previous shipments such as fertilizer, oils, and other freight which would damage more perishable commodities. If the centre pin is uncovered, it might be necessary to cover it with a piece of board, depending entirely upon the character of the freight to be loaded.

Inspect closely for defect in framing which might, by reason of their weakness, allow the sheathing being readily broken or damaged.

The rules above suggested for inspection are for certain shipments not otherwise covered by rules for the transportation of explosives.

Report of Committee on Contour of Tires.

The Master Mechanics' Committee on the contour of tires, W. C. A. Henry, Superintendent of Motive Power, Pennsylvania Lines, Columbus, Ohio, chairman, reported as follows:—

Your committee has been instructed to look into the various points brought out

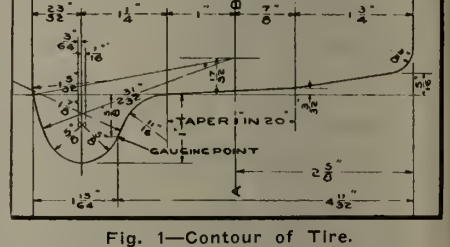


Fig. 1—Contour of Tire.

in the discussion at the last convention and, if possible, recommend a contour of tire that would be most economical in all services; also, recommend a minimum thickness of flange for re-turned tires. The discussion at the 1911 convention was confined to the proposed reduction in height of flange from 1⅛ ins. to 1 in., the taper of tread, and the question of limit of flange thickness of less than 15-16 in.

After considering the replies received to our circular of inquiry and such other data as were available, your committee is very strongly of the opinion that the M.C.B. recommended contour of tread and flange for steel wheels should be used for engine and tender truck wheels. To a very large extent in ordering wheels it is not specified whether for tender trucks or cars, no distinction being made as between the two. It is of distinct advantage to the railways to keep down the number of standards

manufactured as insuring more prompt filling of orders and a smaller stock on hand at their own shops. Car, tender and engine truck wheels are, as a rule, turned up on the same machine, and most shops are provided with special tools for dressing the flanges and treads. To require different tool equipment for different wheels would be objectionable and confusing. In fact, when wheels are being machined, it is not generally known whether application will be made to cars or tenders. Your committee, therefore, recommends for engine and tender truck wheels in all classes of service the contour of tread and flange as shown in fig. 1. This contour is the same as will be recommended to the M.C.B. Association in June, 1912, and differs from the present M.C.B. recommended contour in that additonal metal has been added to the back of the flange, making the contour of the flange identical with the flange for cast iron wheels. This thickening of the flange was recommended with the view of increasing the life of the wheel, as many steel wheels are now withdrawn from service due to thin flange.

Replies received from manufacturers of steel wheels indicate that about 80% of the engine truck and 95% of the tender truck wheels manufactured during the past year are of the 1909 M.C.B. recommended contour.

In driving wheel service the conditions are somewhat different, as the brake shoes generally used are recessed for the flange, and also opposite that part of the tread coming in contact with the rail. This tends to keep down the height of the flanges and retards channelling of tread. On account of the general opposition to any reduction in flange height of driving wheels in road service and the fact that the present A. R.M.M.A. standard contour of tread is so nearly like the M.C.B. 1909 contour, your committee does not feel justified in recommending, at present, any change from the present contour for driving and trailing wheels of locomotive in road service. As a matter of information, we wish to add that while practically all railways are using a contour of driving wheel tire approximating the A.R.M.M. A. standard, almost all are deviating in some particular.

In the case of switching locomotives it is felt that a flange 1 in. high is perfectly safe and will be more satisfactory than the present standard, as a greater mileage can be made with the shorter flange before reaching an objectionable height. As has been previously mentioned, the A.R.M.M.A. and M.C.B. contours of tread being so nearly alike, it was felt unwise to establish a new contour having the M.C.B. flange and A.R. M.M.A. tread, and we, therefore, recommend the contour shown in fig. 1 for driving wheel tires in shifting service.

The six widths of flanged tires shown on sheet 1 of the standards are, in your committee's opinion, entirely unnecessary, and we would recommend that one width be shown, namely, 5½ ins. In the case of plain tires, three sizes as recommended last year are sufficient; the two sizes 6¼ and 6¾ ins. to be eliminated.

As concerns condemning thickness of flange below 15-16 in., after carefully considering the replies received and all information available, we cannot see our way clear to recommend flanges of wheels under locomotives and tenders being allowed to remain in service when worn below this limit.

Our recommendations, therefore, are as follows:—

Engine truck and tender truck wheels, contour as shown in fig. 1.

Flanged driving wheels and trailing wheels of locomotives in road service, present A.R.M.M.A. standard of 5½ ins. wide.

Flanged driving wheels in shifting service to be as shown in fig. 1.

Plain tires, present A.R.M.M.A. standard, three widths, 6, 6½ and 7 ins.

Condemning limit of thickness of flange, 15-16 in.

Master Car Builders Association's Meetings.

This association met at Atlantic City, June 12 to 14, the President, A. Stewart, G. S. M. P. & E., Southern Ry., Washington, D.C., presiding. In opening the convention he said:—"We are meeting again this year, with the approval of our respective companies, to further perfect our rules, and, if possible, to revise them in a manner that will still further reduce our cost of maintenance and clarify matters that have not been understood alike by all of our members; also to devise the best possible manner of complying with new legislation affecting the construction, maintenance and handling of equipment in interchange."

He paid tribute to the earnest work done by the committees on various subjects assigned to them, the principal reports on which are given in earlier pages of this issue. He also referred to the interchange of equipment in the U.S., as regulated by the recent safety appliance acts, and said:—"We are required to change the safety appliances to standard on both system and foreign cars going through the shops for general repairs, and we should have a rule for charging the car owner with a portion of this expense. It is my understanding that we are now subject to a penalty for handling cars marked "U. S. Safety Appliances," if the cars so marked are not in accordance with the law. To inspect all cars received with safety appliance defects, including location, is obviously out of the question, and we should have a rule that will relieve the receiving line for penalty defects and material, location or manner of application, when cars have been stencilled as complying with the law.

"Cars that have been fitted with the special 12 in. coupler to give the required end clearance should be so stencilled for protection to the owners and for the information of the inspectors.

"We should consider a rule for a fair basis of interchange where it affects the removal or turning of steel wheels under freight equipment, and a proper charge for wooden cars which have been reinforced by continuous metal draft sills.

"The question of changing the present M.C.B. specifications for air brake hose has been brought to my attention, and a committee should be appointed to take up this matter and report what changes are necessary."

REVISION OF CONSTITUTION.

The committee on revision of constitution pointed out that prior to the adoption of the new constitution in 1909, a nominating committee presented a verbal report to the convention at the first day's session, and the election called at the third day's session was by viva voce vote. It was felt by some of the members that this method did not offer the best opportunity for the membership to express their preference as to officers, and, therefore, when the constitution was changed provision was made for the so-called secret ballot. It has developed in the election since the adoption of the constitution that this method is not entirely satisfactory, requiring considerable time. The committee proposed certain changes in the constitution, and submitted sample forms of ballots to be used. In the method proposed by the committee each member has an opportunity to vote for the membership of the nominating committee, and at the same time has opportunity to vote for any other member than those named by the nominating committee if he may desire to do so.

H. H. VAUGHAN, Assistant to the Vice President, C.P.R., in discussing the reports, said that the matter was not of great importance so long as the association was willing to trust the election of officers to its nominating committee, but he thought that if printed ballots were to be used, some plan should be evolved by which the names of any members proposed as officers might be put on the ballots in addition to those proposed by the nominating committee. He suggested that the American Society of Mechanical Engineers' plan be adopted, by which the nominees of the committee on nominations are printed as such, but if any section of the membership desires t put up any other candidates for office, they have the privilege of doing so, and the names of such candidates are entered on the regular ballot which contains the names of the candidates proposed by the committee on nominations. This nomination of a candidate other than those nominated by the committee on nominations has to be signed by a certain number of members. He moved in amendment that where 20 members desire to propose a name of any member for any office in place of one or more of the names suggested by the nominating committee, that the secretary shall place that member's name on the printed ballot, making a statement in connection with such name that it has been proposed by a certain number of members. This amendment was adopted.

REVISION OF STANDARDS AND RECOMMENDED PRACTICE.

The committee on this subject said in its report, among other things:—"In accordance with action of this association, 1911 convention, with respect to the establishment of a maximum standard or limiting height for the running board of a standard dimension box car, your committee, after careful consideration, believes that this is governed by the height of the brake staff as referred to in the 1911 proceedings, pg. 564, which fixes this at 14 ft., and with this in mind, and the clearances for the brake wheel as established by the U.S. safety appliance standards, determines the maximum height of running board for the various construction of roof, and, therefore, does not concur in the suggestion."

H. H. VAUGHAN, Assistant to the Vice President, C.P.R., said that was an important question for the C.P.R., and also for other lines, and continued:—"We have in Canada legislation in connection with the height of clearances which is demanded, and I understand some of the bills have been introduced in the U.S., and we feel that it is impracticable to discuss the construction of cars of more than standard height. That is a matter that rests as a rule outside of the car department. But one thing we can do, and that is to fix the maximum height or standard dimension box cars. I think there is no objection to taking a limited height of 13½ ft. on the running board or standard box cars. As nearly as we can ascertain, there are only about 30,000 cars in the U.S. and Canada which exceed this limit. It seems to me just as reasonable for this association to fix a limited height for the running board of a car, as it has been in the past to fix the height of eaves, etc. But if we can establish a limited height that constructors would work to in their cars, there would be some hope of keeping this running board height down to a certain limit. The difference may not appear very great, but if it amounts in practice to nearly 6 ins. in construction of bridges and in structures of that sort, it is important, and the amount of that kind of work that has been going on in Canada and the U.S. in recent years has been considerable. We are very much interested in seeing some action taken by this association that will put this matter in such shape that we can show the standard of the running board shall not exceed a figure to be determined by the committee on standards, which we hope

they can make 13½ ft. for a standard dimension box car."

T. H. GOODNOW, M.C.B., Armour Car Lines, Chicago, who was chairman of the committee making the recommendation, said that one of the things that occurred to the committee's mind was the question of the longitudinal running board, coming up in connection with the outside metal roof, which naturally increased the height of the car at the eaves, and affected the height of the box car at that point. The committee felt that as railways are limited now by the height of the brake wheel and the clearance of the brake wheel under the U.S. appliances standards, to go any further would be tying it down pretty tight. He thought they could not take the benefit of half an inch, or an inch, especially with outside metal roofs and the additional running board that is required with that roof.

H. H. VAUGHAN could see no reason why the outside metal roof designer should not be kept down to designing to the limit. It was the height of the running board that was involved in the question. He moved that the report on the running board be referred back to the committee.

TESTS OF BRAKE SHOES.

This committee reported on brake beam standard as well as testing brake shoes.

L. C. ORD, Car Inspector, C.P.R., said he understood the Air Brake Association had a committee which has recommended 5 ft. for the length of the beam, and the Angus Shops thought it would be well for the committees of the two associations to co-operate in investigating the matter and to determine the standard length.

ELECTION OF OFFICERS.

The following officers were elected:—President, C. F. Fuller, Union Pacific; Vice Presidents, M. K. Barnum, Illinois Central; D. F. Crawford, Pennsylvania, and D. R. MacBain, Lake Shore and Michigan Southern; Treasurer, J. S. Lentz, Lehigh Valley. Executive Committee: R. E. Smith, Atlantic Coast Line; C. E. Chambers, Central of New Jersey, and H. LaRue, Chicago, Rock Island and Pacific.

At a subsequent meeting of the executive committee, J. W. Taylor was re-elected Secretary and F. W. Brasier was elected a member of the arbitration committee to succeed E. D. Bronner, who resigned on his apointment as General Manager, Michigan Central Rd.

American Railway Master Mechanics Association Meetings.

This association met at Atlantic City, June 17 to 19, the 1st Vice President, D. F. Crawford, G.S.M.P., Pennsylvania Lines, Pittsburgh, Pa., taking the chair in the absence through illness of H. T. Bentley, A.S.M.P. and M., Chicago Dock Island and Pacific Ry., Chicago, whose address was read by the secretary. Following are extracts:—

The question of consolidating the Association with the Master Car Builders Association has been discussed since the last convention, but the feeling of the members generally appears to be against anything of the sort being done; the thoughts expressed are to the effect that after 44 years of good service, it hardly seems wise that the A.R.M.M.A. should lose its identity. The two conventions could, however, be held in one week, Monday and Tuesday being set aside for the Master Mechanics' meeting; Wednesday for a joint meeting of the two associations to discuss matters of common interest, and Thursday and Friday for the Master Car Builders' Association. The principal reason for consolidating is to reduce the time away from business, the present arrangement breaking into two weeks for those attending both conventions, but by handling it as suggested the duplication of work would be avoided by the joint session, and only five days would be taken up with both meetings.

A suggestion was made by the General Foremen's Association last year that the members be allowed to investigate and report to the Master Mechanics' Association upon matters pertaining to shop methods and practices, the statement being made that there might be numerous details in shop organization which we were desirous of obtaining information about, but for lack of time had to pass up, and which they were willing and anxious to investigate and report on if asked to do so. This offer was laid before the executive committee who will probably take advantage of it.

Apart from the experience gained at our meetings through the discussion of the various subjects presented, the opportunity for exchanging ideas among members, when outside of the Convention Hall, is great. I am a warm advocate of meetings of this kind, and know personally that valuable information can be obtained from people who have, perhaps, gone through some experiences that we are lacking. I believe we should insist on our men attending conventions; it broadens their ideas, gives them new thoughts and puts fresh life into them, so that on their return to business they are better able to grapple with the problems that confront them.

The question of promoting safety in the operating of railways has received a tremendous impetus lately. About eighteen months ago an organization was started on the Chicago and North Western Ry., in a very humble way, for the purpose of trying to reduce the number of accidents that were occurring daily on our tracks, in the movement of trains and in our shops and roundhouses. The plan worked out so well under the forceful leadership of the general claim agent, and with the assistance of the members of the central safety committee and the local committees on the various divisions, and the results were so gratifying that the scheme was quickly taken up by all of the large roads in the country, and now, fortunately, nearly everybody has acquired the "safety" habit, or as one road tersely sets forth, "It is better to be careful than crippled."

At one time it was thought that most accidents were inevitable, but when live safety committees got into action it is remarkable how quickly this idea changed, and a reduction in 16 months (the latest data for which figures are available) of 107 persons killed and 3,996 persons injured on the C. and N.W. shows what can be done when men make up their minds that it is better to cause a delay than to cause an accident. The fact that it is possible to make such a remarkable showing ha induced the Railway Commission of Indiana to ask all the roads in that State to go and do likewise. Before long the Federal Government will probably step in and call for some action that will help this good cause along; if it would only pass a trespass law and enforce it, a large number of the 5,000 men, women and children who are now being killed each year, because of the dangerous track walking habit would be saved.

The past winter has been the most severe in years, as most of us know to our sorrow, and now that summer is here, we must remember our weaknesses and fix our fences before another winter comes along. In the summer we are liable to forget the cold weather, but that is the time to remember it, and taking advantage of the experience gained, to profit by it. It is only by having the engines and roundhouses in first-class condition that the best results can be obtained, and I am sorry to say when the weather is warm we are likely to forget some of the things we promised to do when we were in trouble.

The progress in locomotive construction appears to have kept pace with the requirements, but nothing of a freakish design has been seen. The most radical departures noticed are the turbine locomotive, built and put in service at Milan, Italy, and the turbine electric locomotive constructed by the North British Locomotive Co. Dr. Diesel is also reported as having designed an electric locomotive, the generator being operated by a Diesel engine. So far, however, nothing definite has been heard of their performance.

The question of fuel economy is of greater importance than ever. The railways and locomotive builders, however, have had this before them, and a large number of Mikado engines have been built, which while pulling very little more tonnage than a consolidation engine, have done it with a decrease in coal consumed for the work performed.

In some places Mallet engines have displaced consolidations with remarkable success in the way of increasing the train load, reducing the number of trains, and doing the work with a reported saving of more than 40% in the amount of fuel burned over other engines engaged in similar service.

The superheater engine has given a good account of itself during the past few months, and the results obtained last winter were, generally speaking, very satisfactory. While we have had troubles on account of lubrication, headers leaking, etc., we are overcoming them successfully for the reason that our education has been improved by our difficulties and where regular men are employed, they soon become familiar with the different conditions brought about by the higher temperatures, so that no more trouble is experienced with superheater than with saturated engines, the improved results justifying the regular crewing of power, where possible.

Several switch engines have recently been equipped with superheaters and excellent results in the way of fuel and water economy are reported. It would seem that the best results in superheating could be obtained by an engine that is working practically up to its capacity most of the time, and not one in switching service, working intermittently, as most of them do, but the satisfactory service reported as being obtained by superheater switch engines would indicate a field for the device in that kind of work.

While nothing very new has been developed in the stoker line, steady progress has been made with the few that we consider have passed the experimental stage, and a number of Mallet engines have, during the past year, been equipped with them, in one case over 9,000 lbs. of coal per hour having been fed into a locomotive firebox by a mechanical stoker.

The question of efficiency in our shops has not been lost sight of. Careful investigations are constantly being made tending to increase our output and decrease cost, and in this we are being ably assisted by the tool and machine manufacturers, who are very much alive to our requirements.

The headlight question is still a very serious one for us; lack of uniformity in state and railway requirements making it difficult to know what to do for the best. The difference of opinion among railways as to what should be used is perhaps justifiable, for the reason that what would be entirely satisfactory on a busy double or four track road with block signals, might not be suitable for a single track road with very little traffic and no automatic signals, and it would be far better for the various states to call for a minimum re-

quirement, that would be low, so as to be suitable for a double track road, and then those roads that felt a brighter light was necessary in certain sections, could provide it.

There appears to be considerable progress in the welding up of locomotive broken parts, firebox sheets, etc., by the use of electricity and oxy-acetylene, and a large number of engines that would ordinarily have required new firebox sheets have been kept in service by repairing defects in the old ones. The welding of flues in place is probably going to be a solution of the failures due to flues leaking.

Considerable interest is being taken in the tests of boiler fireboxes of different designs at Coatesville under the direction of Dr. Gross; but so far, results of these tests are not forthcoming and we cannot yet say whether the standard design of box will have to give way to one of entirely new shape and form.

Elaborate locomotive tests have been made on the Altoona testing plant in connection with the Chicago committee on smoke abatement to see what effect the different locations of air tubes with steam and air jets in the side of the firebox will have on the amount of smoke emitted; also what benefit is derived from brick arches, air openings in firebox door, etc. When the results of these tests are tabulated, a very useful work will have been accomplished.

CONTOUR OF TIRES.

R. PATTERSON, Master Mechanic, G.T.R., Stratford, Ont., in the course of the discussion of the committee's report on the contour of tires, said: "I am not any more convinced this year than I was last year that we should turn our driving tires taper. I think the explanation which the committee has given in regard to tender and engine tires and tires for cars is all right. Where wheels are turned up in the same shop both for the car department and engine repairs, I think that is desirable. We, of course, run our departments entirely separately, and it is not necessary to follow the same plan in turning tires for locomotive work as for car work. Consequently we don't see any reason why we should turn our tires taper for locomotive work. I have heard no explanation yet of why we should turn our driving tires taper except at the extreme edge. How long does that taper last on the tires after the engines are put out? You can turn them more rapidly. You can make a better job of it. Why turn them taper. As I mentioned before, on the road I am representing, we invented that practice 35 years ago. What advantage is there in it? I have yet to hear of an advantage in driving tires being turned taper. It is quicker done. You can make a better job of it. You don't require an expert machinist on the lathe to turn them, and it is only a month or so when the tire becomes worn."

ELECTION OF OFFICERS.

The following were elected:—President, D. F. Crawford, Pennsylvania Rd.; 1st Vice President, T. Rumney, Chicago Rock Island and Pacific Ry.; 2nd Vice President, D. R. McBain, Lake Shore and Michigan Southern Ry.; 3rd Vice President, F. F. Gaines, Central of Georgia Ry.; executive members till 1914, G. W. Widden, New York, New Haven and Hartford Rd.; C. F. Giles, Louisville and Nashville Rd.; W. Schlafye, Erie Rd.

The branch office of the Department of Natural Resources, C. N. R., was opened June 1, in the new section of the Windsor St. station building, Montreal.

The G.T.R. has opened an office in the Montreal Harbor Commissioner's buildings at the foot of St. Sulpree St., Montreal, for the convenience of freight lmporters and exporters.

Atlantic City Convention Notes.

The entertainment features were somewhat cut down from previous years, informal dances being substituted for the usual balls. There were orchestra concerts in the entrance hall of the pier each afternoon and evening, and local gatherings and informal dances at the Marlborough-Blenheim, and on the pier, also evening musicales on the pier. On the Saturday there was the usual baseball game, between the east and the west, each team being composed of eight railway supply men and four railway men, and on the Sunday there were morning and afternoon instrumental concerts at the Marlborough-Blenheim.

Among the Canadian officials in attendance were the following:—

CANADIAN PACIFIC RY.—H. H. Vaughan, Assistant to the Vice President; R. W. Burnett, General Master Car Builder; F. A. Crysler, Assistant Master Car Builder; C. Kyle, General Master Mechanic; J. H. Mills, J. Burns, A. Dixon, Master Mechanics; H. Osborne, Superintendent Angus Locomotive Shops; A. Plow, Mechanical Inspector; G. E. Smart, District Car Foreman; L. C. Ord, Car Inspector.

GRAND TRUNK RY.—W. D. Robb, Superintendent Motive Power; J. Coleman, Superintendent Car Department; J. Hendry, J. L. Hodgson, Master Car Builders; A. A. Maver, J. Markey and R. Patterson, Master Mechanics; J. Powell, Chief Draughtsman Locomotive Department.

A. L. Graburn, Mechanical Engineer, Canadian Northern Ry.; G. W. Robb, Master Mechanic, Grand Trunk Pacific Ry.; G. R. Joughins, Superintendent Motive Power and Rolling Stock, Intercolonial Ry.; W. Kuhn, Master Mechanic, Toronto, Hamilton and Buffalo Ry.; T. Fraser, Master Mechanic, Algoma Central and Hudson Bay Ry.; T. C. Hudson, Master Mechanic, Canadian Northern Quebec Ry.; J. Ogilvie, Inspector Board of Railway Commissioners; W. Cross, ex-Assistant to Vice President, C.P.R.; A. Allen, ex-Superintendent of Motive Power, T. and N.O. Ry.

The Railway Supply Exibits at Atlantic City Convention.

The larger portion of the space on Young's million dollar pier was devoted viva voce vote. It was felt by some of the members that this method did not to exhibits of railway supplies, machinery, etc., there being over 260 exhibitors, using over 83,000 sq. ft. of space. Among the principal exhibitors were the following:—

AMERICAN BRAKE SHOE AND FOUNDRY Co., Mahwah, New Jersey—Brake shoes for locomotives; passenger and freight equipment and electric railway equipment. Brake heads and keys.

AMERICAN LOCOMOTIVE COMPANY, New York, N.Y.—Reception booth.

AMERICAN VANADIUM Co., Pittsburgh, Pa.—Vanadium steel, iron, brass and bronze locomotive parts; vanadium steel forgings and castings, vanadium tool steels, vanadium ore and vanadium alloys.

ANCHOR PACKING Co., Philadelphia, Pa.—Packing and mechanical rubber goods.

BALDWIN LOCOMOTIVE WORKS, Philadelphia, Pa.—Pneumatic power reverse gear for locomotives.

BOWSER & Co., Inc., S. F., Ft. Wayne, Ind., and Toronto, Ont.—Standard self measuring oil pumps; one tank and oil pump combined; one paint oil outfit; one power pump; one automatic registering measure; one automobile filling station; one oil filtration and circulating.

BUFFALO BRAKE BEAM Co., New York, N.Y.—High speed passenger brake beams. Automatically adjustable brake heads, truss and solid brake beams for all classes of cars, locomotives and electric equipment.

COMMERCIAL ACETYLENE Co., The, New York, N.Y.—Railroad car lighting by acetylene. Locomotive headlighting by acetylene, signal lighting by acetylene, marker, gauge and cab lights by acetylene; buoy lantern with sun valve and flasher, commercial acetylene tanks for oxy-acetylene welding, commercial acetylene tank cut open showing asbestos packing.

CONSOLIDATED CAR HEATING Co., New York, N.Y.—Pressure traps, vapor traps, steam couplers, end valves, admission valves, thermostat, electric heaters, switches, resistances.

DEARBORN DRUG AND CHEMICAL WORKS, Chicago, Ill.—Reception booth.

DETROIT LUBRICATOR Co., Detroit, Mich.—No. 0 one feed Bullseye Locomotive Lubricators, No. 5 one feed, No. 11 two feed, No. 22 three feed, No. 22 sectional, No. 32 four feed, No. 42 five feed, No. 52 six feed, No. 62 seven feed, No. 72 eight feed. Half pint air brake lubricator; flange lubricator; one, two, three and four feed air cylinder lubricator, complete with emergency and throttle valve and check valve connection. "T" steam chest plugs, angle and straight; locomotive road cup; locomotive guide cup; Pendry throttle valve; boiler valve; mechanical force feed oiler for motors on section cars. Complete line of all models, sizes and finishes of stationary accessories.

EDISON STORAGE BATTERY Co., Orange, N. J.—Five exhibition boards showing the assembly and parts of the various sized cells made by this company; car lighting battery equipment; short circuit test on a fully charged Edison battery.

FAIRBANKS Co., The, New York, N.Y.—Railroad track scales; platform scales; valves; dart unions and flangers.

FAIRBANKS-MORSE & Co., Chicago, Ill.—Sectionalized No. 32 gasoline section motor car.

FLANNERY BOLT Co., Pittsburgh, Pa.—Tate flexible staybolts; Tate adjustable crown stays; tools for applying Tate staybolts; "F. B. C." arch bar nut locks.

FRANKLIN RAILWAY SUPPLY COMPANY, New York, N.Y.—Franklin automatic fire door; grate shaker; flexible joint between cars; water joint; flexible metallic roof.

GALENA-SIGNAL OIL COMPANY, Franklin, Pa.—Reception booth.

GOLD CAR HEATING & LIGHTING Co., New York, N.Y., and Montreal, Que.—Gold's combination pressure and vapor system; straight vapor system; thermostatic temperature regulator; new ideal pressure regulator; cyclone ventilators; heat storage system for refrigerator cars; wedge lock steam hose couplers; electric heaters.

GOLDSCHMIDT THERMIT Co., New York, N.Y., and Toronto, Ont.—Thermit of various kinds and appliances; metals and alloys produced by the aluminothermic process; specimen pipe welds and apparatus for making same; motion pictures and transparencies to show the operations done by the Thermit process.

GREENE, TWEED & Co., New York, N.Y. Palmetto packing, round and square, for high steam pressures; Palmetto packing, twist, for small globe valves, etc.; Palmetto packing in sets for railroad service; Manhattan packing for low steam and hydraulic pressures. Favorite reversible ratchet wrench.

JOHNS-MANVILLE COMPANY, H. W., New York, N.Y.—Refrigerator and steel passenger car insulation; waterproofing and mastic samples; electrical materials; air pump packings; Vitribestus pipe coverings; high and low pressure pipe coverings; train pipe coverings; wool felt roofing; car roofing; asbestos roofing; throttle and steam hammer packings; Transite asbestos shingles; smoke jack; ebony asbestos wood; ventilators; fire resisting cements; asbestos car sill covering; friction tapes and splicing compounds; packings; gaskets; diaphragm canopy covers; locomotive laggings; in-

durated fibre conduit for electric wiring; Sanitor toilet seats.

LOCOMOTIVE SUPERHEATER Co., New York, N.Y.—Model of Schmidt top header type superheater. Model showing method of setting superheater flues in boiler. Model of superheater unit.

McCORD & Co., Chicago, Ill.—McCord malleable iron and vanadium cast iron journal boxes for freight, passenger and engine tender equipment; draft gear; spring dampener; force feed locomotive lubricator in operation.

NORTON, Inc., A. O., Boston, Mass., and Coaticook, Que.—Various types of jacks.

PYLE-NATIONAL ELECTRIC HEADLIGHT Co., Chicago, Ill.—Pyle-National latest type "E" electric turbo generator set for locomotive electric headlights.

SAFETY CAR HEATING AND LIGHTING Co., New York, N.Y.—Pintsch car lighting system; safety electric axle dynamo lighting system; thermo jet car heating system; Pintsch and electric car lighting fixtures; steam traps, valves, etc.; indirect lighting fixtures; hot water car heating system.

STANDARD COUPLER COMPANY, New York, N.Y.—Standard steel platforms; couplers; Sessions-Standard friction draft gears.

UNITED STATES LIGHT AND HEATING Co., New York, N.Y.—Axle light equipment, stationary and vehicle batteries, electric starters for gasoline trucks and vehicles; complete assortment of parts and partly assembled apparatus.

WESTINGHOUSE AIR BRAKE Co., Pittsburgh, Pa.—Reception booth.

WESTINGHOUSE, CHURCH, KERR & Co., New York, N.Y.—Plans and photographs showing design and construction of machine shops, erecting shops, boiler shops, locomotive and freight car blacksmith shops, stripping shops, planing mills, foundries, power plants, storehouses, roundhouses, etc., with which the company has been connected as engineers or constructors.

WESTINGHOUSE ELECTRIC & MANUFACTURING Co., East Pittsburgh, Pa.—Reception booth.

WESTINGHOUSE MACHINE Co., East Pittsburgh, Pa.—Reception booth.

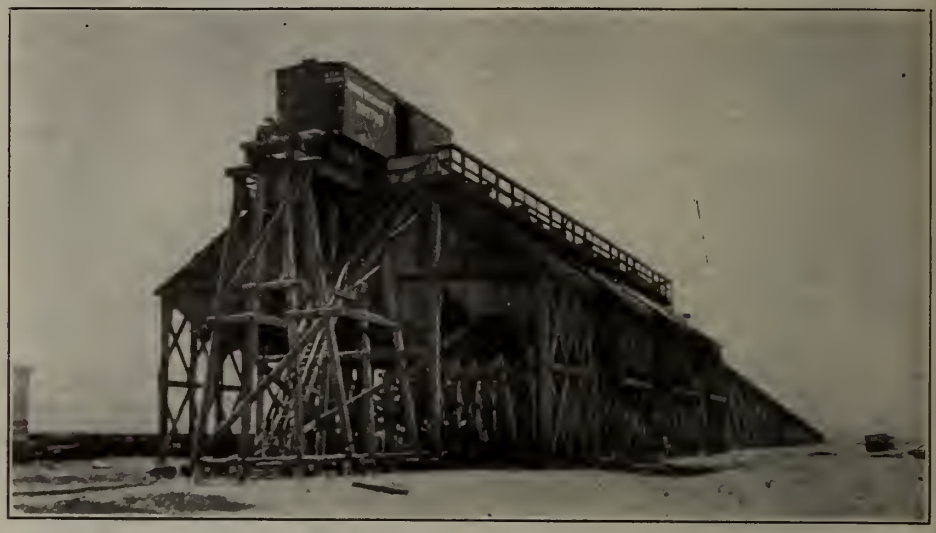
WOOD, GUILFORD S., Chicago, Ill.—Wood's flexible nipple end air hose protector; the Monogram train pipe bracket; standard improved all steel warehouse truck.

1,000 Ton Coaling Station on the Grand Trunk Pacific Railway.

By J. G. Le Grand, Bridge Engineer, G.T.P.R.

It may be of interest to have a description of one of our 1,000 ton coaling stations, which has been adopted as standard for all our principal division points, the one particularly referred to having been built at Edson, Alta., the first division point west of Edmonton.

When I was first called upon to design a coal chute I was furnished with drawings of the one in use on the Grand Trunk Ry., which is called the ramp type. This type, in common with those in use on railways in the United States, is composed of pockets separated by bents 12 ft. centres, with sliding gates and aprons on each side, the whole covered by a frame roof resting on two sides composed of scantling covered with plank. Upon going over these plans the first thing that struck me was the enormous quantity of timber used to accommodate a comparatively small quantity of coal. By adding to a similar cross-section a bent on the outside of the coaling track, this bent supporting upper bins with a revolving gate discharging on the centre of the coaling track. I practically doubled the capacity of the section.

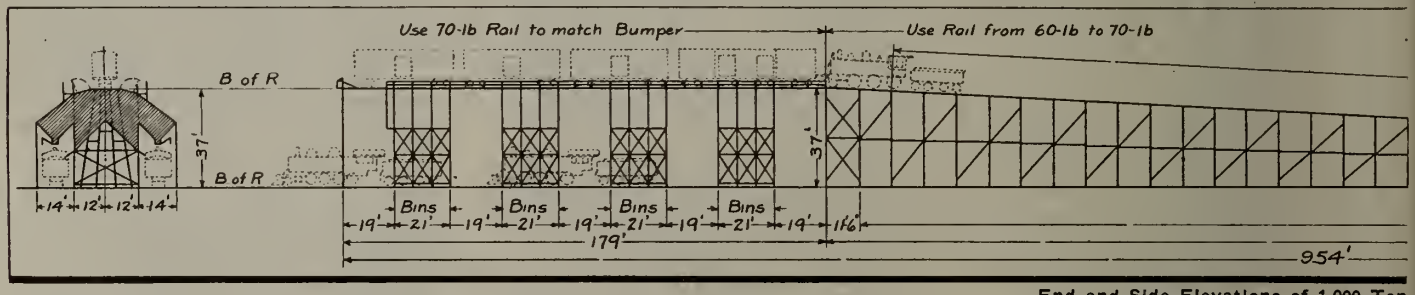


1,000 Ton Coaling Station for the G.T.P.R. at Edson, Alta.

Now, what governed me in the design of the length was the number of cars required to be unloaded at one time, this number being stated to be four cars. These four cars and their length gave me the length required for the horizontal part of the trestle placed over the bins. I then designed the bins in four groups, each one composed of three sections made by four bents 7 ft. centres, well braced together, the space between each group being 19 ft. centre to centre of bents, spanned by means of steel beams carrying the rail on their top flange, each bin being provided on each side with a revolving gate and an apron which can be lowered for discharging into tender. They are also provided, as before mentioned, with two undercut revolving gates, which discharge directly into tender.

The side bins over the coaling track are completely covered with a roof having an inclination slightly greater than the natural slope of the coal, thus allowing the complete filling of each section to the roof line. The centre portion is covered with hinged gates which are opened when coal is to be unloaded from box cars. The centre portion between rails is covered by movable traps, which are removed when hopper cars are used. When there are no cars standing on top of bins, the traps and hinged doors are closed, thus forming a kind of arched roof, upon which the snow will hardly remain.

The trestle approach, as constructed, gives a rise of 8 ins. in 12 ft., which corresponds to about 5.55% grade. The total length from the point where the vertical curve commences to the last bent is 954 ft., of which the vertical curve takes up a distance of 200 ft., the trestle 575 ft., and the horizontal part, including the four groups of bins, 179 ft. The distance between base of rail of the coaling tracks and the base of rail of the coal track is 37 ft., and the distance between the two coaling tracks is 38 ft., these two coaling tracks being called inbound tracks in the mechanical department yard.



End and Side Elevations of 1,000 Ton

Comparing this with the G.T.R. design, the portion required for the bins is 179 ft., with a capacity of 1,000 tons, against 228 ft. for a capacity of 500 tons. The estimated cost of the G.T.R. design is about $18,000 for 500 tons, or about $36 a ton; the G.T. Pacific design costs $25,000 for a capacity of 1,000 tons, which means $25 a ton.

Outside of this, a great feature is the arrangement of groups well separated in case of fire. With the revolving gates in case of fire in any one group of bins, it can be emptied practically instantaneously and the fire extinguished very readily, thus saving practically the

Railway Supply Manufacturers' Association.

The annual meeting was held at Atlantic City, June 13, the President, B. C. D. Stafford, General Manager, Flannery Bolt Co., Pittsburgh, Pa., in the chair.

S. G. Allen, Vice President, Franklin Supply Co., New York, was elected President for the current year, and B. H. Hagerman, Jr., President, N.S. Metal and Manufacturing Co., New York, was elected Vice President.

The following were elected members of the executive committee to serve three years:—First district, F. M. Nellis, Westinghouse Air Brake Co., Boston, Mass.; Second district, O. F. Ostby, Commercial Acetylene Co., New York; Fourth district, J. C. Whitridge, Buckeye Steel Castings Co., Columbus, Ohio; Seventh district, S. M. Dolan, American Car and Foundry Co., St. Louis.

whole structure. In the other design several fires have occurred in which not only the bins but the entire trestle has been destroyed.

The question of capacity is also a very important one, especially in this western country, where coal movement is very often seriously delayed owing to our rigorous winter season, strikes, etc.

The foregoing was read before the Western Canada Railway Club recently. As this design is to represent standard practice, it has been most carefully worked out in every detail, and it contains a number of interesting points that the foregoing description does not mention. The timber sizes are as follows:

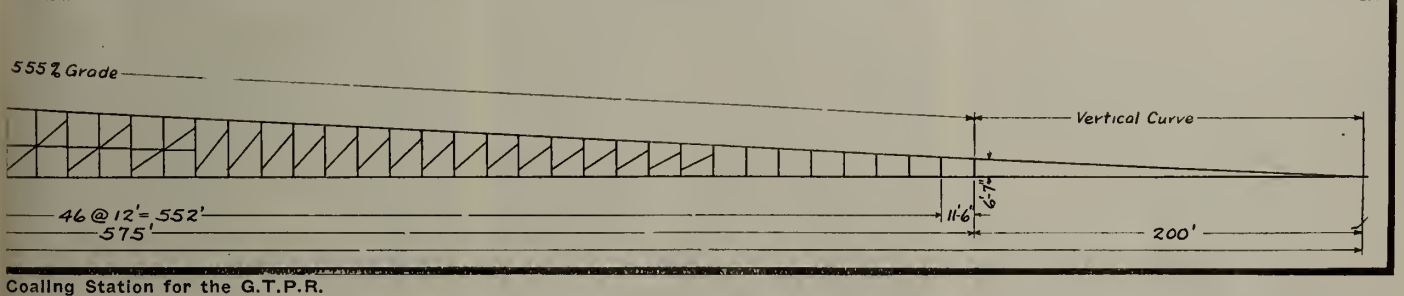
Ties	8 x 8 ins. by 10 ft. long
Guard rails	6 x 8 ins. by 12 ft. 8 ins. long
Stringers	8 x 16 ins. by 24 ft. long
Splices	4 x 16 ins. by 4 ft. long
Caps	10 x 14 ins. by 12 ft. long
Sills	10 x 10 ins. and variable length
Spacing blocks	4 x 10 ins. by 3 ft. 1 in. and 2 ft. 5 ins. long
Posts	10 x 10 ins. and variable length
Sway bracing	3 x 10 ins. and variable length
Longitudinal bracing	4 x 8 ins. and variable length

Two different designs of foundations are called for under different conditions of the ground on which the coaling station is to be constructed. Where piles can be driven, they are in all cases to be used, driven 2½ ft. apart under each post in the line of the station length, two per post under the bin section, and one per post under the ramp, with the heads of the piles in all cases projecting above the ground 1 ft. on which the framed bents rest. Where it is impossible or impracticable to drive piles, the framed bent is to rest on concrete foundations under the bins, and on mud sills under the ramp portion. The concrete for the bin piles is to be a 1-3-5 mixture, the centre one containing 15 cu. yds., and the outer ones 1.4 cu. yds. each.

The vertical curve portion of the approach is filled with a stone fill for drainage purposes to a level of 5 ft. 7 ins., where it strikes the framed structure ramp.

All contact surfaces in the framed structure are to be given a coating of creosote residuum to preserve the timber from decay.

The central openings for hopper bottom cars mentioned in the article are each covered by three doors, 7 ft. by 4½ ft. The outer doors in the top are six in number on each side and measure 5 ft. 9 ins. by 3½ ft. The tender filling doors in the sides and bottom of the bins have swinging doors that cut the coal in the direction of flow down the chutes.



Coaling Station for the G.T.P.R.

J. B. Fuller, operator, Canadian Northern Ry., Woodworth, Man., was, on June 9, sentenced to two years' imprisonment for being intoxicated while on duty.

The Fort William Coal Dock Co. has decided to make extensions to its plant in order to handle the increased business. A contract has been placed with the Brown Hoisting Machinery Co., Cleveland, Ohio, for a six ton bridge and equipment, and another with the Canadian Westinghouse Co., Hamilton, for three generators.

Agreements Between Canadian Northern, Great Northern and Northern Pacific Railways.

The agreements between the Canadian Northern Ry. and the Midland Ry. of Manitoba, through which the Great Northern Ry. and the Northern Pacific Ry. obtain entrance into Winnipeg, are three in number, the first covers the section of the C.N.R. between Emerson and Portage Jct., the second covers the section between Portage Jct. and Woodward Ave., Winnipeg, and the third covers the entrance into the union terminals at Fort Garry.

The first agreement describes the joint section as being the C.N.R. lines connecting with the G.N. Ry. and the N.P. Ry. at the International boundary near Emerson, Man., and near West Lynn tp. to Portage Jct., and the portion of the line westerly from Portage Jct. to any point of connection with the Midland, or other line, the use of which may be acquired, but not west of the G.N. Ry. crossing of the C.P.R. near Wilkes Ave., Winnipeg. The C.N.R. grants the full, joint and equal use of the line to the M. Ry. (and such other companies as it may admit to this joint section) by its own crews and equipment, except that it shall not do any local business, and shall not use any of the industrial spurs on the section westerly from Portage Ave., Winnipeg. If, however, local business is done under the Board of Railway Commissioners' order, or the consent of the C.N.R., the M. Ry. shall pay 80% of the gross receipts to the C.N. Ry.

The C.N. Ry. is to keep the joint section in repair, and if it is not kept in suitable condition for the traffic offering, and the C.N. Ry. is unwilling to put it in such repair, the question shall be submitted to arbitration. The M. Ry. intends to operate freight engines of 362,000 lbs., and passenger engines of 384,000 lbs. weight, and the C.N. Ry. agrees within nine months to reconstruct the bridges as may be rendered necessary, charging the same to capital. The M. Ry. is given the right to string telegraph and telephone wires for its own purposes, and to have its own operating crews, which are to co-operate with the C.N. Ry. crews. In order to make the joint section suitable for the increased traffic, the C.N. Ry. will relay the line with 80 lb. steel, upon the completion of which work the M. Ry. shall pay $30,000 in half yearly payments of $5,000 each.

For the use of the joint section the M. Ry. shall pay $35,000 a year for the Emerson-Portage Jct. section, and $1,225 a year for the line westerly from Portage Jct., and such proportion of 5% on the capital expenditure, other than relaying rails, as the car miles of the M. Ry. bear to the total car miles of all companies using the section, and a pro rata proportion of expenses chargeable to maintenance.

The agreement contains all the necessary provisions defining the powers of each company, safeguarding the interest of each in cases of accident, etc.; reserving to the M. Ry. the right to build its own connection with the C.P.R. at Morris, and providing for referring to arbitration any questions as to which there is a difference. The agreement is to run for 20 years, and the M. Ry. has the right on giving one year's notice to abandon the use of the line westerly from Portage Jct. The C.N. Ry. agrees to ask for parliamentary authority to sanction the agreement being extended for 999 years.

The second agreement provides for the operation of the trains of the two companies over the C.N. Ry. from Portage Jct., and Woodward Ave., in order to enable the trains to enter the Fort Garry union terminal, Winnipeg. It gives the right to six revenue trains per day, with such light engines and empty trains as may be necessary. The trains to be moved shall be through trains, and only the main and passing tracks are to be used. In the event of any local business being done the C.N. Ry. is to be paid 80% of the gross receipts. The trains are to be treated as C.N. Ry. trains, and the engines and cars are to be stored at the C.N. Ry. yards at Fort Rouge. The rental to be paid will be at the rate of $2.50 for each revenue train movement, with 50 cents extra for every car over eight; actual cost plus 10% of cost of cleaning, etc.; actual cost plus 10% of repairs; $2.50 a day for housing each engine; $2.50 for each boiler washing; actual cost plus 10% for supplies; actual cost plus freight, plus 15 cents a ton bunkerage for coal, and 50 cents a tank for water. The agreement also contains similar provisions to the first, as to arbitration, etc. It is to continue in force for five years, subject to the right of the M. Ry. to withdraw on giving a year's notice, and after the five year period is subject to termination by either party on giving two years notice.

These two agreements are assigned by the Midland Ry. to the Great Northern Ry. and the Northern Pacific Ry., which own its capital stock. The Board of Railway Commissioners has recommended the Governor-General-in-council to sanction the agreements, and has permitted the lines to be operated under them for 30 days, pending the obtaining of such sanction.

The Manual of Statistics.—The numerous changes which take place annually in connection with large joint stock corporations — amalgamations, rearrangements, and new incorporations—necessitate a great deal of work in the compilation of such a book of reference as this. The edition for 1912 is brought well up to date, and adequately represents the organization, finances and position of the leading railway and transportation companies of Canada and the U.S., as well as of allied companies, and the industrial concerns of the two countries from which the transportation companies draw such a large portion of their revenues. The present volume has been increased to 1,100 pages; the matter is well arranged, and the index is copious and clear. It is published by the Manual of Statistics Co., 20 Vesey St., New York. Price $5.

The Canadian Northern Ex. Co. has opened a waybill office at Gypsumville, Man.

Canadian Northern Railway Construction, Betterments, etc.

Quebec and Lake St. John Ry.—A deputation waited on the Quebec Government, recently, to urge the building of a five mile extension of the company's Gosford branch. W. A. Kingsland, representing the company, stated that in view of the subsidies voted by the Legislature, he did not think there would be any hesitation on the part of the company in building the line. There were certain preliminary steps needful, and as soon as the necessary data were obtained, arrangements would be made for starting construction.

Canadian Northern Quebec Ry.—Work has been resumed on the erection of the shop buildings at Limoilou, Que., and it is expected that they will be ready for occupancy in November. As soon as the change has been made, the present shops, adjacent to the Q. and L. St. J. Ry. station, will be demolished, and the land so cleared will be utilized for other purposes.

The company has under consideration the extensions of terminal yards, etc., in view of the completion of its transcontinental line in 1914, and negotiations are in progress with the city on various matters in connection therewith. D. B. Hanna, Third Vice President, C.N. Ry., is expected in the city, to take up matters in connection with the project with the city council.

Montreal Tunnel and Terminal Construction.—We are advised that plans and details for the construction of the proposed tunnel under Mount Royal, and the terminals in Montreal, have not yet been approved by the Board of Railway Commissioners. The general plans for the terminals are the subject of negotiations with the Montreal city council, and there are several questions in connection with them which will be argued before the Commission. The company proposes to start operations on the west end of the tunnel before anything is done in the city. The only contract let to the date we were advised, is one for core boring to the Eddy-Burland Development Co., Ottawa. While it is expected that the company will do a good deal of the tunnel work itself, it is very probable that a contract may be let for work at the west end to a company which has a novel device for tunnel excavation.

The Minister of Railways has approved of the tunnel and terminal plans between the back of the mountain and Lagauchetiere St., leaving the Board of Railway Commissioners to settle the location of the remaining distance to the water front. This latter section involves the elevated tracks to which the Montreal city council objects.

Plans are being studied with a view of operating all traffic through the tunnel by electricity. W. C. Lancaster, the engineer, who has the work in hand, is quoted as stating that 120 ton electric locomotives will probably be used, capable of making 70 miles an hour. Electricity will also be used on the suburban lines to be operated in connection with the main line. A press report states that it is likely that the line between Montreal and Ottawa will be electrically operated, but we are advised that this is not correct, as it will be a steam road.

Construction work was started May 24, and preparation is being made for the starting up of the boring plant. Six air compressors with a 400 h.p. motor plant are being installed. Electricity will be supplied by the Montreal Light, Heat and Power Co., according to a statemnet made at that company's annual meeting, June 5, by the President, H. T. Holt, who said that the company had not only secured the contract for power for tunnel driving, but also for the power to operate trains through the tunnel.

Montreal-Ottawa-Port Arthur Line.—The Board of Railway Commissioners has approved revised location plans for the line in Ross tp., mileage 62.09 to 66.19; mileage 69.15 to 71.08; mileage 254.53 to 256.2, and mileage 267.2 to 271.4 from Ottawa. An effort is being made to have the line carried through Pembroke, and as a compromise it was decided to have a route surveyed through Churchville. The Board of Railway Commissioners has also approved revised location plans for the line through Davis tp., at Callandar, through Pedley tp.; location plans through unsurveyed territory in Thunder Bay district, between mileage 363 and 398, and mileage 399.21 to 404.46, Sudbury Junction, and revised location plans between mileage 149.85 and 161.03, from Port Arthur. It has also authorized a temporary connection with the C.P.R. at Dalzell station, Thunder Bay district, Ont., for construction purposes only.

The question of the location of the line through North Bay, Ont., has been practically settled, a new agreement having been reached, under which certain subways will be built, and watchmen provided at certain level crossings by the company.

The Board of Railway Commissioners has authorized the company of connect its line under construction with the C.P.R. at Meadowside, 15 miles west of North Bay, Ont., for construction purposes only, for six months from May 28.

Track laying was started at the Port Arthur end of the line in May, and District Engineer Hazen is reported as stating that the laying of steel would be going on in earnest by the end of June.

W. M. Everill, of the Railways Department, Ottawa, is acting as Inspecting Engineer for the department between Ruel and Port Arthur, Ont.

Canadian Northern Ontario Ry—Construction is reported to be proceeding at a satisfactory rate on the line under construction into Ottawa from Toronto. An official inspection of the line was made recently by the company's officers and G. A. Mountain, Chief Engineer of the Board of Railway Commissioners, the special train carrying the party running as far east as Enterprise. A train service was put in operation as far as Napanee, June 14.

Press reports state that plans are being prepared for improving the Brockville, Westport and North Western Ry., which is owned by C.N.O. Ry. interests, and is being operated as a branch line. It is proposed to relay 40 miles with new ties and steel and to bring it up to the C.N.O.R. standard. The point of junction is about 35 miles north of Brockville, to which point the grading on the Toronto-Ottawa line has been completed, and it is expected that tracklaying will be started in June. The grading beyond this point to Ottawa is well advanced.

The company has made very extensive purchases of land in the vicinity of Leaside Jct., near Toronto, for yard and terminal purposes, and a site for a model city.

We are advised that it is extremely probable a start will be made this season, from the Toronto end, on the company's projected line from Toronto to Niagara Falls, and that the route to be followed will be mainly along the Electrical Development Co.'s right of way, on which is the power transmission line between Niagara Falls and Toronto. In connection with this projected construction the Board of Railway Commissioners has authorized the crossing of the C.P.R. spur line from Islington to Mimico, an interlocking plant to be installed at the cost of the C.N.O. Ry.

The plans for the entrance into Hamilton were filed at the end of May, and the city council has had them, as well as the alternative route suggested by F. L. Somerville, consulting engineer, under consideration. There has been considerable discussion, and it is said that the several railway companies whose lines enter the city are arranging to discuss the question of the erection of a union station and some rearrangement of routes.

The question of the route of the line from Hamilton to Niagara Falls, and from Hamilton to Windsor, is under consideration, and considerable speculation is being raised in various towns owing to the visits of people representing Mackenzie, Mann and Co. The firm is interested both in the steam line and electric feeders for the same, but where the one begins and the other ends cannot be definitely gauged from the negotiations with the various public authorities. That there will be a steam line from Toronto to Hamilton and Niagara Falls, and a line from Toronto to Windsor, whether as an independent line, or as a branch of the Toronto-Niagara Falls line, is pretty certain. All the other lines to be built will probably be electric. This seems to be indicated by a recent statement of Sir Wm. Mackenzie, who is quoted as stating that the steam line will be carried into London from the east, connecting with the London and Port Stanley Ry., for a lease of which the company would make an offer. The line would run through Delaware and on to Detroit.

Canadian Northern Ry.—Sir. Wm. Mackenzie, President, returned to Toronto, June 22, after a trip to the Pacific coast. He reached Victoria, B.C., June 4, and after an interview with the Premier, left for the east a couple of days later. In the course of his trip he is reported to have stated that it was expected to have the line completed through from coast to coast by 1914. The question of a ferry service to connect the lines on the mainland with those on Vancouver Island had not been considered. The building of a second track between Port Arthur and Winnipeg was a necessary work, and would be undertaken, but he could not state just exactly when it would be started.

Efforts are being made along the route of the branch line now terminating near Gunflint, near the International boundary line between Ontario and Minnesota, to induce the compnay to extend it, if not to complete it into Duluth, as originally proposed.

It is expected that the work of completing the Duluth, Winnipeg and Pacific Ry., a subsidiary of the C.N.R, in the U.S., will be so far advanced as to enable it to be opened for traffic July 1. The line extends from Virginia to Duluth, Minn., and completes the through connection between the Canadian Northern Ry. main line at Fort Frances, Ont., and Duluth. A contract is reported to have been let to J. Roy, Duluth, for the erection of a freight and passenger office there.

A contract for the construction of a section of the Winnipeg and Northern branch of the C.N.R. has been let, we are advised, to the Western Construction Co., Winnipeg.

M. H. MacLeod, General Manager and Chief Engineer, is quoted as stating that the company proposes to build the new yard at St. Boniface, Man., with its own forces.

The train shed at the Fort Garry, Winnipeg, union station, is practically completed and is being used.

The Board of Railway Commissioners has approved of an agreement between the C.P.R. and the C.N.R. for the provision of joint facilities in Regina, Sask.

We are advised that no information is availabie with respect to the branch line which press reports state is to be built from Regina to a junction with the Goose Lake line at Rosetown, Sask. A second report states that the junction point with the Goose Lake line will be Kindersley.

Plans for an addition to the station building at Saskatoon, Sask., have been prepared, and Superintendent Entwistle is quoted as stating that the work will be started at an early date.

A contract has been let to W. J. Cowan, Winnipeg, for building 25 miles from Vonda, on the Winnipeg-Edmonton line, to Fenton, on the line to Prince Albert, Sask.

The Board of Railway Commissioners has approved of the location of the line from near Radville into Moose Jaw, Sask., through tps. 16 and 17, range 26, west 2nd meridian, and part of Moose Jaw, mileage 84.25 to 87.13. The terminals in Moose Jaw have been arranged for, the location of the station being between Athabasca and Fairford streets. Surveys are reported to have been made for a line from Moose Jaw to Swift Current, passing through Gravelburg, at which point it is stated that the line from Maryfield, now terminating west of Bengough, will effect a junction.

We are officially advised that a contract has been let to W. J. Cowan, Winnipeg, for an extension of the Thunder Hill branch for 21 miles northerly from Canora, Sask.

Surveys were recently started on the projected branch line from Prince Albert, Sask., to a junction with the Dominion Government line to Hudson Bay at either Split Lake or The Pas, Man.. P. H. Canby being in charge of the work. The survey starts just north of the C.N.R. bridge over the Saskatchewan river, and the line will be about 150 miles long. Press reports state that 50 miles of this line is to be built this year, and that grading has been started at Prince Albert.

We are officially advised that the company has no information in relation to surveys being made for a line southeasterly from Camrose, Alta., which press reports credit to the C.N. Ry.

M. H. MacLeod is quoted as stating recently that he was not prepared to say definitely when the company would be running its trains into Calgary. The work on the line from Vegreville was being proceeded with as rapidly as circumstances permit, and the line would certainly be completed by the fall. It is reported that arrangements are being made with the G.T. Pacific Ry. for facilities in that company's proposed station.

Press reports state that 1,500 men and 300 teams are at work on the Brazeau branch. which runs westerly from the Vegreville-Calgary branch near Stettler. It is expected to have the line completed for 170 miles this year. Track is reported to have been laid for 100 miles. A regular train service was started on this branch between Warner and Rocky Mountain House, June 1, a distance of 120 miles.

The Northern Construction Co., we are officially advised, has been given the contract for the line from Munson, Alta.. easterly for 110 miles. Munson is a station north of Drumheller on the Vegreville-Calgary line, and the point to which the 110 miles will carry the line will be to Benton, near the Saskatchewan boundary, to which point a line from Saskatoon, passing north of Goose Lake, has been completed.

A branch line described as the Pakan branch is under construction, work being started May 1. Pakan is four miles north of Oliver, northeasterly from Edmonton, and it is proposed to build the line as far as Birch Lake. about 20 miles. M. McCrimmon is reported to be in charge of construction for the Northern Construction Co. We are advised that the contract has been let to the Northern Construction Co. for the building of 10 miles, and that about 20 miles of the branch has been definitely located. On the company's map this line is shown as effecting a junction with the line now under construction from North Battleford, Sask., to Athabasca Landing, for which the Saskatchewan and Alberta Legislatures have voted guarantees of bonds.

Work is reported to have been started on the line from Calgary southerly, the McDonald grading outfit having been delivered at Macleod from Athabasca Landing, in May. The camp has been located nine miles north of Macleod. The James O'Connor Construction Co., which has the contract for grading from Macleod to Pincher Creek, is reported to have four miles completed, and expects to have it finished by Aug. 1 We are officialy advised that a contract for a section on this line south of Macleod has been let to W. J. Cowan, Winnipeg. E. O. Archibald is engineer in charge of construction at Macleod.

The Board of Railway Commissioners has approved of revised location plans for the projected Strathcona-Calgary branch, mileage 72.58 to 81.75. This line passes through Lacombe, Alta., at which point a station to cost about $25,000 is to be built on Stanley St. The work of clearing the right of way for the line is being proceeded with. The plans provide for a line running west of Pigeon Lake, and about 20 miles westerly of the Calgary and Edmonton Ry., for a considerable mileage. It is expected that construction will be started in the near future.

The line to Athabasca Landing has been completed. and the work of finishing ballasting, putting up buildings, etc., is in progress.

C. W. Cummings, of the Northern Construction Co., is quoted as saying that a large force of men is at work on the Peace River line between the Pembina and the Athabasca rivers, and it is expected to have track laid to the latter point, 98 miles northwest of Onoway, Alta., this year. The subcontractors at work on this mileage are —Rumble, Mann and Co., J. Bradley, Allen Bros., T. Hopgood, W. F. McKenzie, W. Hopgood, P. Peterson.

Work on the line to the Yellowhead Pass is being pushed. The steel for the bridge across the Pembina River has been delivered, and it is expected that this will be erected within three months. It is expected to have track laid through the Pass by the fall.

Canadian Northern Pacific Ry.—E. V. Johnson, Inspecting Engineer of the Department of Railways, made an inspection of the line as far as the present track end recently, and also went over the route, as far as the North Thompson River, to inspect the work under construction. The line is completed to Mount Lehman, and it is expected that a regular passenger service will be put in operation as far as Chilliwack shortly. All the bridges have been built on the line as far as Hope, except the one at Silver Creek.

We are officially advised that the company has abandoned its original plan to construct a line on the north bank of the South Thompson River, having obtained permission from the C.P.R. to build a parallel line on that company's right of way on the south bank of the river, between Black Canyon and the Oregon Jack Creek, about four miles. This change will effect a saving of about $100,000 in construction, as the route on the north bank was through moving clay banks.

Press reports state that negotiations are in progress by which the company will obtain access to the Great Northern Ry. terminals now being developed on False Creek, Vancouver.

Vancouver Island.—F. G. Holt, Executive Agent, Vancouver, recently completed an inspection of the work on the island, and is quoted as stating that satisfactory progress is being made. The route of the line across the island to the east coast, he stated, had not been definitely located.

Grading is in progress as far as Cowichan Lake, and the line is under contract to about two miles west of the Alberni slope.

We are advised that nothing has been definitely decided as to the letting of further contracts for grading on the line so as to carry it to Comox, on Vancouver Island.

Press reports state that interests associated with the C.N.R. have what is referred to as the Bute Inlet Ry. charter, and have in contemplation the building of a line to connect the lines on Vancouver Island with those on the mainland by means of a bridge across the Seymour Narrows. It is reported that about 20 miles of line will be built from Campbell River, a point on the present authorized lines of the C.N.P. Ry., to Seymour Narrows, and from the mainland to a junction with the line now being built from through the Yellowhead Pass to Port Moody and Vancouver. The bridge part of the undertaking, it is said, will cost about $20,000,000, and reports state that a preliminary arrangement has been made with the Provincial and Dominion Governments as to its erection. (May, pg 231.)

Bridge Construction on the Canadian Northern Pacific Railway.

Tenders will be received to July 8 for the steel superstructure for 10 bridges over the Fraser and Thompson Rivers on the Canadian Northern Pacific Ry. The plans were prepared by Waddell, and Harrington, Kansas City, Mo., who planned and supervised the erection of the New Westminster bridge for the British Columbia Government. The Victoria Colonist gives the following details of the bridges:—

No. 1 will cross the Fraser River a short distance above the C.P.R. bridge, or about five and a half miles below Lytton. tarting from an abutment on the hilside at the west end, the structure will have three 40 ft. deck plate spans, supported by a steel bent and a steel tower, a 60 ft. plate girder span over the C.P.R. right of way, a 40 ft. tower span and tower, a 90 ft. plate girder span, a 424 ft. three hinged riveted spandrel arch span and a 30 ft. plate girder span.

No. 2 will cross the Fraser River just below Lytton, about half a mile from the C.P.R. station. The portion of this bridge over the water will consist of a 292 ft. riveted span, with flanking spans of 150 ft. at each end, from which the centre span is to be erected by cantilevering. The approaches will be of deck plate girders supported by concrete piers.

No. 3 will cross the Thompson River a very short distance above the mouth and within the town limits of Lytton. At the west end of the bridge there is to be a concrete abutment supporting a 90 ft. plate girder span, following which there will be three 150 ft. deck, open webbed, riveted girder spans, the westerly one resting on either a small concrete abutment or a bearing cut into the solid rock. The concrete piers are all to be parallel to the current.

No. 4 will cross the Thompson River midway between Spatsum Station and Black Canyon siding, on the C.P.R. The superstructure will consist of six 125 ft. deck, open webbed, riveted spans, supported by five concrete piers and two concrete abutments. Four of the piers have to rest on pneumatic caissons, and the other pier and abutments are to have ordinary earth foundations.

No. 5, which will cross the Thompson River about six miles below Ashcroft. will consist of a single through truss span of about 16 ft., resting on little concrete abutments that are resting on solid rock. As the final survey of this crossing has not yet been made, the span length may have to be changed later. As

the bridge is located over a narrow deep gorge, it will be necessary to erect by cantilevering and anchoring back into the solid rock.

No. 6 will cross the Thompson River about two miles above Ashcroft. It will consist of six 93 ft. deck plate girder skew spans on concrete piers having shafts parallel to the current. These shafts will rest on cribs containing concrete and piles, if the latter can be driven, as in all probability they can by using water jets, for the material to be penetratcd is mainly sand and gravel, covered in many places with boulders.

No. 7, which will cross the Thompson River another mile above Ashcroft, will be on a skew. It will consist of twelve 85-ft. deck plate girder spans, resting on 11 concrete piers and two concrete abutments.

No. 8 will bisect the Thompson River about a mile below Wallachin. It will consist of 11 93 ft. deck plate girder, skew spans. These will rest on 10 concrete piers and two concrete abutments to be founded on piles, if they can be driven.

Bridge No. 9 will cross the Thompson River almost midway between Wallachin and Savonas, which stations are some seven miles apart. At the west end of the bridge location there is a rocky hill from the foot of which the bridge will start with a through skew span of about 200 ft., then will come six half through, plate girder skew spans of 91 ft. each. These spans will rest on concrete piers and abutments.

No. 10 will cross the North Thompson River some four miles by water from Kamloops. It will consist of thirteen 93-ft. deck plate girder spans resting on fourteen concrete piers.

The contractors are given until June 1, 1913, to complete the work.

Toronto, Hamilton and Buffalo Railway Co.'s Annual Report.

The report for the year 1911, presented at the annual meeting at Hamilton, Ont., June 4, shows there was no change in the capital stock during the year, it remaining at $2,500,000. The funded indebtedness authorized and outstanding remains at $4,280,000. There was expended for additions and betterments, and charged to cost of road and equipment, $163,410.92, of which $51,-084.25 was expended on yards and sidings; $40,062.24 on stations and other structures; $53,571.20 on roadway, and $18,693.23 on new equipment.

The operating revenue was $1,256,-012.43, an increase over the previous year of $110,243.33. The increase in freight and switching revenue was $90,-470.31, and in passenger revenue $14,-216.19. Operating expenses increased $95,490.36, being $726,775.54; maintenance of way and structures showed an increase of $47,033.68, due to extensive repairs to track, bridges and buildings; maintenance of equipment increased $14,890.45; traffic expenses $2,206.02; transportation expenses $28,911.92, due to greatly increased volume of traffic and general expenses $2,448.39. Other income was $46,333.53, an increase of $3,464.30, and total deductions from income were $269,449.72, a decrease of $22,847.70, the principal decrease being for hire of equipment. The surplus for the year was $300,108.18, an increase of $39,752.45.

The company's equipment includes, 18 passenger, and nine switching locomotives, 11 passenger cars, four combination cars, two mail, express and baggage cars, 181 box cars, 73 flat cars, 10 stock cars and nine cabooses, and 25 other road cars.

In addition to 80.57 miles of main line and 11.06 miles of branches, the company has 3.89 miles of second track, 37.04 miles of side tracks, and three miles of track owned and leased to the C.P.R.

TRAFFIC STATISTICS. — Operating revenue per mile of road, $14,909.92; operating expenses per mile of road, $8,627.43; net operating revenue per mile of road, $6,282.49; operating revenues per train mile, $2.70; operating expenses per train mile, $1.56; net operating revenue per train mile, $1.14.

EQUIPMENT STATISTICS.—Average mileage per engine, 29,703; cost of repairs per engine mile, 7.63 cents; total capacity of freight train cars, tons, 7,950; average capacity of freight train cars, tons, 30; seating capacity of passenger cars, 842; average seating capacity of passenger cars, 56; average mileage per passenger train car, 24,548; average cost of repairs per passenger train car mile, 1.170 cents.

CONSUMPTON OF FUEL BY LOCOMOTIVES. —Total tons of coal, bituminous, 42,018; average pounds consumed per mile run by locomotives in freight service, 178; average pounds consumed per mile run by locomotives in passenger service, 62; average cost of fuel per ton, $3.11; average cost of fuel per locomotive mile, 16.28 cents.

The directors for the current year are:—J. N. Beckley, Rochester, N.Y., President; Sir Thos. G. Shaughnessy, Montreal, Vice President; D. McNicoll, Montreal; W. L. Scott, Ottawa; Sir Edmund Osler, N. Kingsmill, and W. P. Torrance, Toronto; W. C. Brown, W. H. Newman, and C. F. Cox, New York; H. B. Ledyard, Detroit, Mich.

Rotary Snow Plough for Reid Newfoundland Co.'s Railway.

The Reid Newfoundland Co. is building a rotary snow plough at its shops at St. John's, Nfld., of which the following are particulars:

The engine consists of two horizontal cylinders 17 ins. bore by 22 ins. stroke each, cast with half saddle, rigidly bolted together, and to the frame. Steam is distributed to the cylinders by slide valves worked by Walschaert valve gear, and arranged so that the one engine works in the opposite direction to the other. Each engine is connected by a balanced crank disc to a cross shaft, on the end of which is a bevelled gear cast steel pinion, which meshes with the bevelled gear on the end of the rotary wheel shaft.

The boiler is of the straight locomotive type, length of barrel 9 ft. 6½ ins., smoke box extension 2½ ft., diameter of barrel inside 4 ft. 10¾ ins., thickness of barrel plates 5/8 in., thickness of smokebox tube plate 5/8 ins., length of firebox casing outside 8½ ft., number of tubes, steel, 202, diameter of tubes outside 2 ins., firebox (steel) length inside 7 ft. 7 ins., width inside 4 ft. 3 ins., thickness of tube plate 5/8 in., top, back and sides 7-16 in., heating surface firebox 131 sq. ft., tubes 1,000 sq. ft., total heating surface 1,131 sq. ft., grate area 28 sq. ft., working pressure 180 lbs. per sq. in. Steam is supplied from the dome of the boiler to the steam chests of the engines by two 4¾ ins. inside diam. copper pipes, one on each side of the boiler. The throttle valve is inside the dome, and is operated by the engineer from the cab by a spring lever and quadrant in the usual way.

The tender is supported on two bogies, the axle boxes of which are connected with the equalizing beams. It is designed to carry 5½ tons coal, and the tank about 3,000 gals. of water. Both engine and tender are fitted with Janney couplers, and spring buffers are provided between the engine and tender.

The wheel of the rotary consists of a cast iron conical hub, keyed to the rotary wheel shaft. Bolted to the forward side of this drum is the arm piece which takes the knives, and to which the six scoops are fastened by angles. These scoops are also fastened to the steel plate disc which forms the back of the wheel, and in turn is bolted to the aft side of the conical hub. Each scoop is open on the front side, and through these openings the snow is taken in. The knives are hinged and so arranged that they automatically adjust themselves into cutting position. The scoops are tied together at their outer ends by 4 x 1 in. flats on the circumference, and have also a ¾ in. diam. diagonal tie rod between each. This makes the front of the wheel where the cutting takes place extra strong, and stiffens up the scoops at the front, as the disc plate does at the back. The diameter of the scoop wheel is 12 ft. The wheel is encased in a drum, with a rectangular front or hood. The knives, being slightly in front, are the first to encounter the snow. The wheel, of course, can be made to rotate in either direction, to throw the snow on one side of the track or the other, and the top of the hood is provided with a spout fitted with a movable cover, which can be turned to suit the direction in which the wheel is rotating, by means of a mechanical arrangement inside the cab.

The plough is carried on two four wheel plate frame trucks. Ice cutters and flangers are applied as a safeguard against derailment. The ice cutters are composed of two parts, the wing and the cutter. They are secured to a wrought iron frame supported by bearings on the front of the forward truck. There is a pneumatic operating gear under control of the pilot, by which the ice cutters and flangers may be raised or lowered. The frame of the plough is constructed of two 55 lb. I beams and two 45 lb. channel beams. The cab is made extra strong, and is partitioned off in front of the boiler, the forward part being the pilot house and the rear the engineer's cab.

The plough is equipped with the following mountings:—One 9½ pump, standard Westinghouse automatic brake, one engineers automatic brake valve, one governor, one blower valve, two check valves, two locomotive pop safety valves, one chime whistle, two self-acting injectors, one triple sight feed bull's eye lubricator, two steam gauges and two duplex air gauges, one set automatic water gauges.

Abuse of Rolling Stock.—On all sides one hears reference to the increasing cost of maintaining rolling stock in condition. An instance of what is happening daily to freight cars in general came before the attention of the writer recently when passing through one of the larger freight yards of this country on a train, the car that caught his attention standing at the edge of the through running tracks. A box car door was being closed by two men, and difficulty having been experienced by them in sliding it along its tracks, force was applied. At the rear edge of the door a flat edged axe was being driven into the car body sheathing, and the door pried along about an inch each time. When observed, the door was nearly closed, and the car body where the axe pry had been used looked as though the car had been badly side swiped, leaving the car in a condition that would doubtless require its shopping at an early date for new sheathing. Such treatment—presumably by railway employes, too—should not be tolerated. This and many other examples of the way in which rolling stock is subjected to rough usage, affords a partial explanation of the reasons for the increasing costs of maintaining stock in repair.

F. W. Atherton, former purser of the C.P.R. s.s. Empress of Britain, was sentenced to two years in the Dorchester penitentiary, at St. John, N.B., June 25, for theft of travellers' cheques, etc., from the Dominion Ex. Co.

RAILWAY DEVELOPMENT.

Projected Lines, Surveys, Construction, Betterments, Etc.

Alberta Interurban Ry.—The Vice President has been investigating the question of the motive power to be adopted on this projected railway. It has been decided, we are advised, to adopt the heavy oil engine, conveying its power by friction. This motive power, it is claimed, is several times more powerful than the gas-electric, and is produced at a cost of from one-third to one-fourth, and probably about one-half of that of electric installation, and has the additional advantage that the vibratory and other objectionable features are nil. The class of rolling stock has practically been decided, and will consist to a large extent in following the plans of the big railways. The power unit will have a seating capacity of from 26 to 40 passengers, and baggage and other facilities, and will be able to haul up to eight freight cars. These will be platform cars with fairly high sides. The motors will be able to haul over any pulls of the line, four of the largest freight cars of the regular steam lines. The lines will be built on the highways, the use of 26 ft. on one side having been freely granted. The plans for the first section of the line have been approved by the Department of Railways, and are now before the Board of Railway Commissioners. (June, pg. 299.)

In the item in our last issue the name of A. F. MacLaren, Toronto, was inadvertently omitted from the list of directors.

Alberta, Peace River and Eastern Ry.—The work plans for this projected railway came before the Minister of Railways for aprpoval June 26. The plans sho wa line starting at the international boundary west of the Milk River, via Cardston, Pincher, the Happy Valley to Cochrane, keeping about 25 miles west of the Calgary and Edmonton Ry., and passing through the Big Prairie country, on to the Peace River country. A branch line to Edmonton, and another to Fort Churchill, are shown. The line will connect with the Great Northern Ry. and the Northern Pacific Ry., to the south of the international boundary. (May, pg. 238.)

Atlantic, Quebec and Western Ry.—Quebec Oriental Ry.—The Board of Railway Commissioners has approved an agreement between these companies for the erection of joint shops at New Carlisle, Que. C. R. Scholes, New Carlisle, is General Manager. (April, pg. 101.)

Burrard Inlet Tunnel and Bridge Co.—The question of the site of the bridge is under discussion, and the local municipalities have made certain representations to the Minister of Railways. The site agreed to is that which was acquired by the Victoria, Westminster and Yukon Ry., but since the amalgamation of interest in the bridge project, the V., W. and Y. Ry. has not given its assent to the sale of the site by the bridge company. (June, pg. 299.)

Cariboo, Barkerville and Willow River Ry.—Surveys wer emade for this projected railway by — McGregor, of Gore and McGregor, Vancouver, B.C. The company was dissatisfied with the work done and claimed $1,645.70 damages, and $4,999 paid for work done, etc. Mr. McGregor disputed the claim and put in a counterclaim for additional remuneration. At the hearing, June 7, the company's claim was dismissed, and Mr. Mcgregor allowed $225 on his countercliam, but without costs. (May, pg. 239.)

Central Ry. of Canada.—The Board of Railway Commissioners has approved location plans for this line from near the McAlpine station of the C.P.R., to near the G.T.R. station at South Indian, Ont., mileage 7.2 to 38.165. This portion of the route passes through Routinier, Fournier and Lemieux. The company's plans also show an extension of the line from McAlpine to Hawkesbury, on the Ottawa River. (June, pg. 299.)

Chicago, Milwaukee and St. Paul Ry.—Surveys are reported completed for a line from Fargo to Grand Forks, N.D., thence crossing the Red River into Minnesota, in a nearly direct northerly line to Winnipeg. R. Hamilton, Milwaukee, Wis., was the engineer in charge. Right of way is reported to have been secured from Fargo to Grand Forks. (April, pg. 187.)

Delaware and Hudson Co.—Press reports state plans have been discussed for extending the Napierville Jct. line from its present junction with the C.P.R. at Delson Jct., across the St. Lawrence River and through Verdun into Montreal. (May, pg. 238.)

Edmonton, Dunvegau and British Columbia Ry.—Surveys were started June 8, for a spur line from the G.T. Pacific Ry. in Edmonton, to the southwest quarter of sec. 24, tp. 43, range 25, which has been acquired as a terminal site. — Jackson, who is in charge of the surveys, is quoted as stating that the plans are to provide for extensive trackage, roundhouse, machine shop and other necessary buildings. (June, pg. 299.)

Edmonton, Dunvegan and British Columbia Ry.—Considerable work is being done on the grading of the first 30 miles out of Edmonton, Alta. The steel is being delivered and it is expected that tracklaying will be started early in July. (June, pg. 299.)

Esquimalt and Nanaimo Ry.—We are officially advised that a contract has been let to Culleton Bros., Spokane, Wash., for grading and bridging on the Comox extension, from McBride Jct., to mileage 10 in the direction of Courtenay, B.C. The contract calls for the completion of the work by Mar. 31, 1913. (June, pg. 300.)

Fredericton and Grand Lake Coal and Ry. Co.—We are officially advised that A. E. Trites and Son, the general contractors for the building of this line from Fredericton to Minto, N.B., have let subcontracts as follows:—For clearing—Station 355 to 450, L. Taylor; station 454 to 560, H. Burns; station 633 to 792, J. W. Steevens; station 1,156 to 1,636, Barns and Nichols. Except for the distances included in the above, the subcontracts mentioned below cover the grading and any clearing:—Station 1 to 100, A. E. Trites and Son; station 100 to 160, J. Mavor; station 160 to 200, Patterson Bros.; station 200 to 355, Mavor Bros.; station 355 to 528, J. E. Armstrong; station 528 to 633, McPhail and Baird; station 792 to 1,056, Cook, Kitchen & Co.; station 1,056 to 1,151, McLeod and McNeill; station 1,156 to 1,214, Wm. Rocheford; station 1,322.50 to 1,636, Sutton and Martin. Subcontracts have not been let for the sections:—station 633 to 792, station 1,214 to 1,322.50. The section, station 1,151 to 1,156 covers the bridge across the Little River, the contract for the masonry work has been let to D. C. Burpee and Son, who will also do the masonry work on the Nashwaak bridge, and build the concrete culverts at stations 97.50, 110.50 and 143.50. McLaggan and Bain have the contract for the masonry and concrete work at Burpee Mill stream, and stations 881.50 and 986, while the Bailey Brook arch, station 1,279, and a number of arch culverts will be built by — Maxwell. H. W. D. Armstrong, Fredericton, N.B., is Chief Engineer. (June, pg 300.)

Grand Lake and Bell River Ry.—Press reports state that arrangements are being made to start construction on this line, so as to have it finished by the opening of the National Transcontinental Railway. J. B. Fraser, 74 Nepean St., Ottawa, is Chief Engineer. (June, pg. 300.)

Kettle Valley Lines.—The Board of Railway Commissioners has approved location plans for the extension of the Kettle Valley Ry. from mileage 4.80 to 38.99 west of Pemberton, B.C.

A contract is reported to have been let to G. A. Carlson and Co., Spokane, Wash., for about 35 miles in the vicinity of Pemberton, the work to be completed in 1913. A. McCulloch, Penticton, B.C., is Chief Engineer. (June, pg. 300.)

The Klondike Mines Ry. was re-opened for traffic May 1, and reports from Dawson, Yukon, state that 5,000 ties have been distributed along the line, and that other material has been taken in for the repair and improvement of the roadbed, etc. (July, 1911, pg. 647.)

Medicine Hat, Alta.—We are officially advised that the line which will be built partly by the Ansley Coal Co. and partly by the city of Medicine Hat, will be constructed under and operated by the coal company, which will have its own rolling stock. It is said that ties and steel rails have been ordered. W. Ansley, Medicine Hat, Alta., is President. (June, pg. 301.)

Montreal to James Bay.—Several survey parties have left Montreal for James Bay, with a view of locating a line from some point on Rupert's Bay, at the mouth of the Nottaway River, to Montreal or other points in Quebec. There are several companies authorized to build such a line, and subsidies have been voted by the Dominion Parliament and the Quebec Legislature to aid in its building. The Quebec Government, however, has under consideration a proposition for building the line as a Government work. (June, pg. 301.)

North Ry.—A contract has been entered into between the Department of Railways and the North Ry. Co., under the provisions of the act passed last session of the Dominion Parliament granting aid, among other lines, for one from Montreal to mileage 837 west of Moncton on the National Transcontinental Ry., and from that point to Hudson Bay at the mouth of Nottaway River, Que., a total distance of about 500 miles.

We are advised by F. H. Clergue, President, that the North Ry. was incorporated at the last session of the Quebec Legislature for the purpose of building this railway. The surveys preliminary to construction are now being made, and are expected to be completed in time to permit of contracts being let by the end of the year. (See Montreal to James Bay on this page. Also North Eastern Ry., June, pg. 301.)

Owen Sound and Meaford Ry.—The Owen Sound, Ont., town council has unde reconsideration a bylaw for submission to the taxpayers providing for guaranteeing the bonds of this projected railway. (Mar., 1911, pg. 207.)

Pacific Great Eastern Ry.—Three parties are reported to be in the field locating the route. One party, under J. Nelson, has been operating between Port Atkinson lighthouse and Newport, B.C.; a second, under W. Oakley, has been working between Newport and Green Lake Summit, and a party in charge of J. Callaghan, Chief Engineer, is going over the route to Lillooet, 120 miles from Vancouver. Press reports state that preparations are being made for an early start at construction. (June, pg. 301.)

Prince Edward Island Ry.—We are officially advised that the Minister of Railways has selected the route from Cape Tormentine, N.B., to Carleton Point, P.E.I., for the Prince Edward Island car ferry service. The adoption of this route

will mean the sending of considerable traffic over the New runswick and Prince Edward Island Ry., extending from Sackville, on the Intercolonial Ry., to Cape Tormentine, 36 miles. It is said that an agreement has been reached between the Government and the company, which is controlled by the Lieut.-Governor of New Brunswick, for acquiring its line under the provisions of the act relating to the taking over of branch lines for the Intercolonial Ry. The only work which will be necessary in addition to stardardizing the gauge of the P.E.I. Ry., will be the construction of ferry terminals at Cape Tormentine and Carleton Point. (April, pg. 182.)

Quebec and Saguenay Ry.—In a recent interview, A. H. N. Bruce, Chief Engineer, is quoted as saying:—"The building of the line to Pointe-a-Pic, commonly called Murray Bay, was commenced at Cape Tormente in May, 1911, by the contractors, O'Brien and Doheny, and work is so far advanced that we calculate to have trains running over the road by the first snow fall next autumn. We have finished 90% of the construction and will begin to lay the rails from Cap Tormente to Nairn's Falls in the middle of July, and have the whole line tracked by November. Last summer we landed on the beach at Pointe-a-Pic a 65-ton engine and 12 freight cars, and have lost no time in the construction work. This locomotive and freight cars were used to transport the machinery for the new Eastern Canada Pulp Co.'s mill at Nairn's Falls, and the branch of railway leading from Pointe-a-Pic to the pulp mill was first attended to, in order to haul this machinery, etc. The construction was one of the heaviest propositions on this continent. As a rule, in railway building, the easiest work is at the beginning. It was the very reverse with us. We started right in on heavy work, and for the first 16 miles had to cut through solid rock. The line will run through two tunnels, one four miles east, to Cap Tormente, 500 ft. in length, and the other at Cap Martin, four miles below Les Eboulements, 300 ft in length."

The length of the line is 56 miles to Murray Bay, and the extension to Nairn's Falls is 7.5 miles. The grading etc., for the latter section was carried out by the Bishop Construction Co. (May, pg. 238.)

St. John and Quebec Ry.—We are officially advised that a contract has been let to J. H. Corbett and Sons, Kittaning, Pa., for grading, tracklaying, ballasting and bridge building (except the steel work) on the line from Fredericton to Rothesay, 65 miles. The bridges over the St. John River and the Kennebecassis River, on this point, are to be built by a bridge company, the Dominion Government having granted special subsidies for them.

Press reports state that the Quebec Contracting Co. has sublet work on the 62 miles from Fredericton to Woodstock to the following:—J. C. Scott and Co., Fredericton, from Woodstock to Meduntic; Smith and Merrithew, mileage 7 to 16.5; Collins, Labelle and Prey, mileage 16.5 to 20; G. H. Tuitere, Brownville, Me., one mile at Springhill; W. and C. R. MacDonald, mileage 27 to 32; J. A. Wheaton and Son, St. John, mileage 32 to 35. F. A. Hibbard is Chief Engineer for the general contractor on this section. It is further reported that the Corbett firm has sublet a portion of its contract to Morrison and Clark, ummerside, P.E.I.

The contract for efncing the right of way, and the stringing of the telegraph line, has been let to T. R. Campbell, Salisbury, N.B. (June, pg. 302.)

Seymour's Narrows, B.C.—A deputation from Vancouver Island waited on the Dominion Government, June 11, to urge the construction by the Dominion of a bridge across the Seymour's Narrows, so as to give direct railway connection between Vancouver Island and the British Columbia mainland. The cost of the bridge is estimated at $20,000,000. The Premier promised that an engineering party would be sent out to investigate and report upon the feasibility of the project.

Temiskaming and Northern Ontario Ry.—The Minister of Railways has approved of plans for the proposed crossing of the Montreal River on lots 10 and 11, con. 1, Tudhope tp., Nipissing district. This crossing is on the Enk Lake branch. Work is reported to be progressing favorably on the building of the branch. The right of way has been cleared to Montreal River, 25 miles, and about five miles of grading completed. (June, pg. 302.)

Birthdays of Transportation Men in July.

Many happy returns of the day to:—

W. H. Allison, District Freight Agent, C.P.R., Saskatoon, Sask., born at London, Ont., July 22, 1885.

J. H. Black, ex-Superintendent, Temiskaming and Northern Ontario Ry., now at Cobalt, Ont., born near Smiths Falls, Ont., July 8, 1874.

M. S. Blaiklock, Engineer Maintenance of Way, G.T.R., Montreal, born at Quebec, July 19, 1859.

D. E. Blair, Superintendent of Rolling Stock, Montreal Tramways Co., born at St. Thomas de Montmagny, Que., July 25, 1877.

D. C. Coleman, General Superintendent, Manitoba Division, C.P.R., Winnipeg, born at Carleton Place, Ont., July 9, 1879.

Geo. Collins, General Manager, Central Ontario Ry., Trenton, Ont., born at Kingston, Ont., July 20, 1860.

G. C. Conn, Vice President, Pere Marquette Rd., Detroit, Mich., born at Woburn, Mass., July 1, 1867.

D. D'E. Cooper, Canadian Freight Agent, Lehigh Valley Rd., Toronto, born at Buffalo, N.Y., July 8, 1862.

John Corbett, ex-General Foreign Freight Agent, C.P.R., Montreal, born in Lanarkshire, Scotland, July 19, 1863.

E. J. Coyle, ex-Assistant General Passenger Agent, C.P.R., Vancouver, B.C., born at Stayner, Ont, July 23, 1870.

S. E. Dewey, Commercial Agent, G.T.R., Pittsburgh, Pa., born at Beckenham, Kent, Eng., July 4, 1879.

J. F. Dolan, City Passenger and Ticket Agent, Richelieu and Ontario Navigation Co., Montreal, born at Kingston, Ont., July 1, 1868.

F. C. Foy, Canadian Passenger Agent, New York Central Lines, Toronto, born there, July 5, 1881.

W. R. Haldane, ex-Division Freight Agent, Kootenay and Boundary District, C.P.R., Nelson, B.C., now at Detroit, Mich., born at Galashiels, Scotland, July 6, 1867.

J. H. Hanna, ex-Division Freight Agent, G.T.R., at Hamilton, Ont., now at Calgary, Alta., born at London, Ont., July 27, 1867.

A. D. Huff, Division Freight Agent, G.T.R., Ottawa, born at Chatham, Ont., July 17, 1866.

C. A. Jaques, General Manager, Montreal and Lake Erie Steamship Co., Montreal and Great Lakes Steamship Co., and Jaques Transportation Co., Montreal, born there July 15, 1849.

J. P. Kavanagh, Local Manager, Ogdensburg Coal and Towing Co., Montreal, born at Plattsburg, N.Y., July 17, 1862.

R. G. McNeillie, District Passenger Agent, C.P.R., Calgary, Alta., born at Lindsay, Ont., July 1, 1883.

J. M. Macrae, District Freight Agent, Canadian Northern Ry., Saskatoon, Sask., born at Stornoway, Scotland, July 31, 1884.

T. J. Maguire, Accountant, Quebec Central Ry., Sherbrooke, Que., born at Quebec, July 31, 1860.

R. E. Perry, Assistant General Freight Agent and Chief of Tariff Bureau, Intercolonial Ry., Montreal, born at Drayton, Ont., July 5, 1876.

R. Preston, Master Mechanic, Manitoba Division, C.P.R., Winnipeg, born at Toronto, July 28, 1863.

J. E. Quick, General Baggage Agent, G.T.R. and G.T.P.R., Toronto, born at Richmond, Ontario Co., N.Y., July 10, 1851.

G. G. Ruel, Chief Solicitor, Canadian Northern Ry., Toronto, born at St. John, N.B., July 5, 1866.

P. E. Ryan, Secretary, National Transcontinental Railway Commission, Ottawa, born there July 26, 1876.

Geo. Stephen, General Freight Agent, Canadian Northern Ry., Winnipeg, born at Montreal, July 5, 1870.

R. F. Struthers, Chief Inspector of Time Service, C.P.R., Winnipeg, born at Stratford, Ont., July 31, 1879.

Sir Thos. Tait, President, Fredericton and Grand Lake Ry and Coal Co., born at Melbourne, Que., July 24, 1864.

H. T. Wilgress, Agent, C.P.R. Pacific Steamship Service, Yokohama, Japan, born at Lachine, Quebec., July 29, 1857.

The Death of James Stephenson.

On June 5, W. Wainwright, Vice President, G.T.R., Montreal, received a cablegram stating that his brother in law, James Stephenson, had died at Clevedon, Somerset, Eng., as the result of an accident. Only a few days before Mr. Wainwright had received a letter from him, written in the best of spirits and saying that he was in excellent health. Subsequently Mr. Wainwright received a letter from Mrs. Stephenson giving particulars of the accident. Mr. and Mrs. Stephenson had been in London, where they had celebrated Mr. Stephenson's 75th birthday. They reached home about 5 p.m. and after reading some letters that had arrived during his absence Mr. Stephenson went upstairs. The supposition is that in coming down he missed his footing at a turn in the stairs and fell the whole flight to the bottom, striking his head, which brought on concussion of the brain. He did not regain consciousness and died at 3 a.m. the following day. He was buried at Weston Super Mare, where his mother-in-law, Mrs. Arnold, formerly of Toronto, is buried.

Mr. Stephenson was born at Lancaster, Eng., in June, 1837. On coming to Canada in 1855 he entered the British American Telegraph Co.'s service, and in 1856, on its amalgamation with the Montreal Telegraph Co., entered the Grand Trunk Ry. service as telegraph operator, afterwards occupying the following positions in the same company's service:—1861 to 1862, train dispatcher, Kingston, Ont.; 1862 to 1863, agent at Don, Toronto; 1863 to 1867, Assistant Superintendent, Toronto; 1870 to 1874, Assistant Superintendent, Kingston; June 29, 1874, to June 13, 1881, Assistant Superintendent, Montreal; June 13, 1881, to July 1, 1884, General Passenger Agent; July, 1884, to Feb. 16, 1896, Superintendent, Montreal. In the latter year he was superannuated and went to England to live, first going to Weston Super Mare, and in 1910 removing to Homeleigh, Walton Park, Clevedon, a short distance from Weston Super Mare.

During the Fenian raid in 1866 he enlisted in the volunteer militia and went to the front, subsequently becoming captain and then major, and retiring in 1871, retaining the latter rank. He married a daughter of the late Richard Arnold, of Toronto, and sister of the late Mrs. Wm. Wainwright. He visited Canada in 1911, receiving a warm welcome from old colleagues and other friends. He was one of the earliest subscribers to The Railway and Marine World.

National Transcontinental Railway Construction.

Owing to the revision of certain drawings, the commissioners extended the time for receiving plans for station and other buildings referred to in our last issue, from May 31 to June 14.

It is reported that on the 578 miles in District B, extending from the New Brunswick boundary to Megiskan bridge, grading is completed on all but 80 miles; and that of the mileage on which track has been laid, only 30 miles have yet to be ballasted.

The Quebec city council has decided to call the Government's attention to the fact that when the Champlain market was sold for $100,000, it was on the understanding that it was to be used as the terminal site for the National Transcontinental Ry. and to ask the Government to carry out the agreement made.

The Quebec board of trade has passed a resolution urging the commissioners to push forward the work on the line between Quebec and Cochrane, Ont., so that it may be completed at the same time as the line easterly to Cochrane. This section of the line, R. W. Leonard, commissioner, stated would be ready for operation by the end of the year. The contractors are operating a bi-weekly train service from Cochrane easterly to Peter Brown Creek, 150 miles, and bi-weekly from Cochrane westerly to Crow Creek, 103 miles. (June, pg. 291.)

Grand Trunk Pacific Railway Construction.

The Port Arthur, Ont., city council, discussed the company's plans for entering that city, June 15. The company informed the council that it will start construction almost immediately on the line along Empire avenue. At Fort. William, the company is preparing to build its line into the union station, now that the Board of Railway Commissioners has approved of location plans for the line in accordance with the agreement between the city and the C.P.R., an order which rescinds that made Oct. 6, 1909. The company is also laying additional tracks in the Mission River yards.

The Board of Railway Commissioners has approved of revised location plans for the Regina-Moose Jaw branch from mileage 0 to 2.1, and a diversion of 0.4 of a mile at mileage 36.4.

Surveys are reported completed by the party under — Silcox, for a line from Watrous, through Swift Current, Sask., to the international boundary. The first 50 miles of the line is said to have been definitely located, and it is reported that construction will be started early next year.

D. McPherson, representing McPherson and Quigley, is quoted as stating that his firm has completed the last of the masonry and concrete work for the bridges, etc., on the Tofield-Calgary line, and that according to the present rate of progress, track will be laid and the line ready for operation into Calgary in the fall.

Reports from construction gangs, quoted in Edmonton, June 14, state that grading is practically completed to 140 miles west of the British Columbia boundary, and that considerable grading has been done west of that point on the 100 miles intervening to Fort George.

Grading gangs are at work west of Fort George. It was expected to have steel laid to Tete Jaune Cache, 53 miles from the B.C. boundary line, June 30, but this depended upon a 2,000 ft. tunnel being completed at mileage 47. Two steamboats and 12 gasoline launches are employed in transporting men and materials from Tete Jaune Cache, on the Upper Fraser River, to the camps in the direction of Fort George.

The line from Prince Rupert, B.C., has now been opened for traffic as far as the Skeena River, 164 miles, the Board of Railway Commissioners having given its approval for the opening of the last 64 miles, June 4. The construction of the bridge across the Skeena River is well advanced, and it is expected to have it completed early in July. Work is well advanced between this point and Hazelton, and track will be laid into it as soon as the bridges are completed. There is still a lot of heavy work to be done east of Hazelton to Mud Creek. (June, pg. 291.)

Little Current Channel Bridge, Algoma Eastern Railway.

The Algoma Eastern Ry., the construction of which was described in The Railway and Marine World for June by the Chief Engineer, will cross the channel between the mainland and Manitoulin Island. The small intervening islands are being utilized to make the spans required shorter. All but one of the bridges are solid spans, as the channel between Goat and Manitoulin Islands at Little Current is the only one required to be open for navigation. In consequence a swing or lift bridge was necessitated at this point.

The present plans call. for a 372 ft span swing girder, with approaches from each side, giving two clear channels 150 ft. wide. The Little Current approach is across a single 60 ft. deck plate girder, and the approach at the other end is across two 70 ft. deck plate girders. The swing bridge pier is circular, 31 ft. in diameter below the water line, and 28 ft. above. The swing bridge abutments and the approach girder piers, as well as the land abutment piers are all of concrete, and with the central swing girder pier of the same construction, run down to bed rock, which is at the bed of the channel. The central pier extension, on to which the swing revolves, is 425 ft. 9 ins. long by 49 ft. wide. The embankment approaches from the Little Current end are short, while that on the other end is of some length. The bridge and approaches are on a tangent and level, at an elevation of 636.00, or 23 ft. above the mean water level. The whole structure has been approved by the Minister of Public Works, and was designed to conform to the Dominion Government specifications of 1908, class I. This is the plan that has been filed, but there is under discussion the substitution of the swing span by a bascule lift span, with consequent change in the present arrangement.

Railway Finance, Meetings, Etc.

Canadian Pacific Ry.—On his return to Montreal, June 10, Sir Thomas Shaughnessy was reported to have stated, in regard to the rumors that the C.P.R. shares would be split and arranged to cover separately, the land, steamships and railway departments, that the directors had given no thought whatever to such a proposal, and, in any case, it would not be legal.

Dominion Atlantic Ry.—Approximate passenger earnings for May, $51,740.95; freight earnings, $51,657.87; total earnings, $103,398.82, against $97,100, total earnings for May, 1911.

Grand Trunk Ry.—The G.T.R. is reported to have arranged with Blair and Co., and the Bankers Trust Co., New York, for the financing of $4,483,675 of 5% equipment trust notes repayable in 10 years.

Kootenay Valley Ry.—Press reports recently stated that the C.P.R. had purchased the K.V. Ry., running from Bonners Ferry, Idaho, to Creston, B.C., and that the transfer would be made June 1. We are officially advised that there is nothing in the report.

Montreal and Vermont Junction Ry.—Following are the officers and directors for the current year:—President, E. H. Fitzhugh; Vice President and Managing Director, G. C. Jones; Auditor, W. G. Crabbe; Secretary Treasurer, A. H. Gilmour; Assistant Secretary Treasurer, W. H. Chaffee.

New York Central and Hudson River Rd.—There has been deposited in the office of the Secretary of State at Ottawa a lease and agreement, dated Apr. 23, between the Guaranty Trust Co., New York, and the N.Y.C. and H.R. Rd., the Lake Shore and Michigan Southern Rd., the Michigan Central Rd., and the Cleveland, Cincinnati, Chicago and St. Louis Ry. The Canadian interests affected by the lease and agreements cover the Canada Southern Ry., an interest in the Toronto, Hamilton and Buffalo Ry., the Ottawa and New York Ry., the St. Lawrence and Adirondack Ry., and the Rutland and Noyan Ry.

Pere Marquette Rd.—The U.S. court at Detroit, Mich., has authorized the receivers to raise $3,500,000 to take $1,800,000 of equipment obligations now due, to provide for the purchase of further equipment, and to make improvements on the line. The order also permits the receivers to pay out of the earnings of the line interest on the underlying mortgages as it becomes due.

Quebec Central Ry.—Under the provisions of acts passed last session of the Quebec Legislature amending the company's charter and confirming an agreement between the Q.C. Ry. and the C.P.R., meetings of bondholders were held in London, Eng., June 12, when resolutions consenting to the terms and stipulations of the first act, and the schedules attached thereto were passed. The holders of the 4% debenture stock met first; then the holders of the 3% debenture stock, and then the holders of income bonds. A special meeting of shareholders was subsequently held and resolutions as to the lease of the line of the C.P.R. were adopted.

A London, Eng., cable, June 12, states that the lease to the C.P.R. was approved, and that it will become operative Dec. 31, after having been approved by the C.P.R. shareholders. Under the terms of the lease the interest on all the Q.C.R. securities is guaranteed by the C.P.R. for 999 years. The directors will be appointed jointly by the C.P.R. and the holders of securities. The company's head office has been transferred from England to Canada, where all future meetings will be held.

Quebec Central Ry.—Gross earnings for April, $107,371.25; expenses, $67,633.37; net earnings, $39,707.88, against $104,176.10 gross earnings; $65,901.30 expenses; $38,274.80 for April, 1911. Aggregate gross earnings for 10 months ended Apr. 30, $1,067,441.22; expenses, $737,097.96; net earnings, $330,343.26, against $964,536.49 aggregate gross earnings; $661,461.44 expenses; $303,075.05 net earnings for same period 1910-11.

Toronto, Hamilton and Buffalo Ry.—At the annual meeting at Hamilton, Ont., June 4, the following were elected directors for the current year:—J. N. Beckley, W. C. Brown, Nicol Kingsmill, H. B. Ledyard, D. McNicoll, W. H. Newman, Sir Edmund Osler, W. L. Scott, Sir Thomas Shaughnessy, W. P. Torrance and W. K. Vanderbilt, Jr.

White Pass and Yukon Route.—Gross earnings for four months ended Apr. 30, $81,439, against $131,570 for same period, 1911.

The Board of Railway Commissioners has notified railway companies to show cause why a general order should not issue requiring railway companies to furnish a heated car service.

Automatic Signals of the Toronto, Hamilton and Buffalo Railway.

The T.H. and B. Ry.'s annual report for 1911 shows that $18,136.58 was expended on automatic signals between Hamilton and Vinemouth, Ont., 11 miles. From Kinnear to Vinemount, 7 miles, the line is single track and the signals are so arranged and controlled that as against opposing trains this is one block section, while for following movements several trains may follow one another through short block sections. The arrangement of these signals is shown in the accompanying illustration. Vinemount is a regular passing point. Kinnear is a day and night telegraph office. Six regular passenger trains run in each direction over this section daily, and a similar number of reguiar freight trains. In adition there from one to five extra freight trains daily. There is a heavy descending grade westbound, signai 27.1 being 301 ft. higher than signal 33.2. This amounts to nearly a 1% grade. The sngnalling between Hamilton and Kinnear, about three miles, has no special features. Power semi-automatic home signals have been provided in connection with the mechanical interlocking plant at the G.T.R. crossing. The entrance to the receiving yard is at Kinnear.

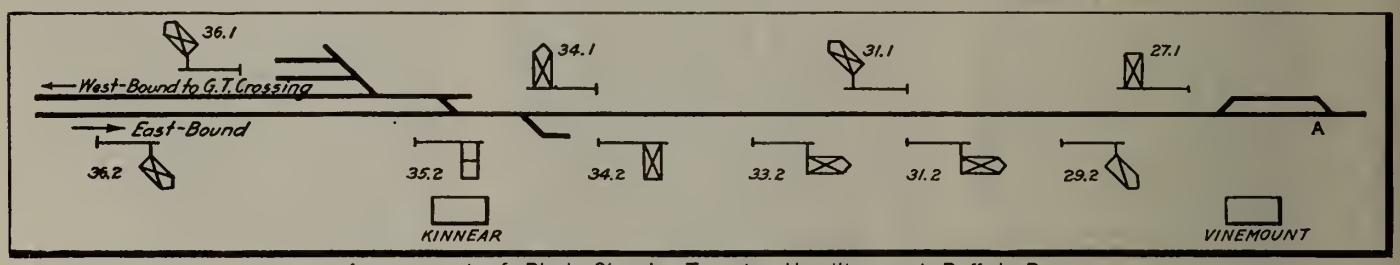
On account of the heavy up grade from Kinnear to Vinemount, thre eastbound intermediate signals have been provided to permit close headway between eastbound trains, whereas only one westbound intermediate signai is required on account of the higher speed of westbound trains. Signal 31.1 governs movements to the westbound main of the double track section and clears as soon as the switches are set for this movement, provided the block is unoccupied. Signals 27.1 westbound and 34.2 eastbound govern movements into the single track block between Kinnear and Vinenal 34.2, is provided in order to hoid mount. Signal 35.2, which repeats sigeastbound trains back of the crossover at the end of the double track, when a westbound train is approaching. Signal 35.2 is always regarded as a nabsolute signal, except under orders from the operator at Kinnear, and such orders are given only for switching movements into the yard. In case it is desired to make a switching movement from the eastbound track into the yard ahead of a westbound train which has not yet reached Vinemount, the operator opens a switch which prevents signal 34.2 from clearing; and this in turn leaves signal 27.1 free to clear for a westbound train.

Signal 27.1 clears when a westbound train enters the preliminary section at point marked "A," provided no opposing train has cleared or passed signal 34.2 and there is no preceding westbound train nearer than signal 31.1. As soon as a westbound train has cleared the block between 27.1 and 31.1, a following train will get a 45 degree indication. Signal 27.1 will give a 90 degree indication if the preceding train has passed signal 34.1.

The signal operation for eastbound trains is similar to that westbound, following trains getting the 45 degree indication when running one block apart and the 90 degree indication when running two blocks apart. In other words the same facility is afforded for following trains as in the case of double track signalling.

All intermediate signals are permissive. They are not required for protection against opposing trains, but only to facilitate following movements. It should be mentioned, however, that when 27.1 clears for a westbound train, signals 29.2, 31.2 and 33.2 are set in the stop position; and signals 34.2 and 35.2 are, of course, prevented from clearing. Likewise, when 34.2 clears for an eastbound train signal 31.1 is set in the stop position as well as 27.1 being prevented from clearing.

This arrangement is that of the A.P.B. block system, devised by the General Railway Signal Co., which installed the signals.



Arrangement of Block Signals, Toronto, Hamilton and Buffalo Ry.

Regulations for Prevention of Forest Fires by Railways.

Order 16570, dated May 22, of the Board of Railway Commissioners, covers the method of equipping locomotives so as to prevent them from being a cause of forest fires, and at the same time lays down the liabilities and requirements of railway companies in the event of such a conflagration occurring. The order cancels earlier orders 3245, 3465, 8903 and 15995, bearing on the same subject.

Every locomotive must be so equipped with smokebox netting as to prevent the discharge of iive cinders. When equipped with an extension smokebox, the whole space through which the smoke ascends must be covered with a mesh not larger than 2½ by 2½, No. 10 b.w.g., the openings in this screen not to exceed 17-64 in. square. Diamond stacks are to have 3 by 3, No. 10 b.w.g., screen at the flare of the stack, the mesh openings not to exceed 13-64 in. square.

The ash pans are to have sheet iron dampers where practicable, and where it is not, 2½ by 2½, No. 10 b.w.g., netting, such dampers to be secured by heavy springs or a split collar. Overflow pipes from the injector or boiler are to connect into the front and rear of the ashpans in order that they may be properly wetted, and are to be used yearly from Apr. 1 to Nov. 1, unless otherwise directed.

Inspectors must be provided by the companies at divisional and terminal points to examine, at least once a week, the netting, dead plates, ash pans, slides and all other fire protecting appliances, and to keep a record of every inspection, recording the locomotive number, time, condition of apparatus, and record of the repairs necessitated, this book to be open for inspection by the board. No locomotive must be permitted to operate on the discovery of any defects, untii repaired. The railway must aiso appoint special inspectors to make an independent examination monthly, and to report the results of the inspection to the chief officiai responsible for the operation of the motive power. An authorized official of the board is to be free at any time to make an examination of the locomotive equipment.

Employes are to exercise extreme care in not injuring the fire-protecting appliances, and to see that the back dampers are not open when running ahead, or the front dampers open when running tender first. The depositing of fire or live ashes upon the tracks or right of way outside the yard limits unless immediately extinguished, is forbidden.

Lignite is not to be permitted as a fuel on iocomotives unless otherwise ordered by the board.

The railways are ordered to estabiish and maintain such fire guards aiong the line as the chief fire inspector may prescribe, the iatter submitting to each railway annually a statement of the measures deemed necessary to maintain the line safe from fire. These measures may provide for the cutting and disposai by fire of all the debris and undergrowth, and the ploughing up of strips on one or both sides of the line as locai conditions require, the intention being to adjust the protective measures to the local conditions to the degree of making the expense proportionate to the fire risk and the possible damage.

Cultivated lands are not to be entered upon for the erection of such protective appliances except by the consent of the occupant, the matter being immediately referred to the board in the event of a refusal.

In carrying out the provisions of the Railway Act concerning the removal of dead grass, etc., from the right of way, the railways are forbidden to burn any ties, cuttings, debris or litter on or near the right of way between Apr. 1 and Nov. 1, except under such supervision as will prevent the spreading of the fire beyond the strip. The chief fire inspector or authorized member of the board may require all such burning to be carried out under a written order.

The railways shall provide and maintain a sufficicnt force of rangers from Apr. 1 to Nov. 1 each year for an efficient patroi, the methods of the rangers being subject to the approval of the chief fire ranger. The annual statement of the chief fire ranger to the railway shall provide for the number of men with their stations and duties, the acquisition and location of the necessary equipment for the transportation of the tools and force from point to point, and any other measures that are considered to be essential by him.

Railways that use oil as a fuel exclusively on all or any portion of the system, shall be relieved of such part of these requirements as may seem to the Board safe and expedient.

All employes shall be ever alert to report the existence and iocation of a fire, train empioyes reporting to the agent at the nearest telegraph station and to the first section employes passed, it then being the duty of the person advised to notify the nearest fire rangers. Any fire presumably started by a railway shall be attended to either independentiy or under direction by the section hands or other employes that are available, provided those employes are not at the time engaged in labors immediately necessary to the safety of trains. When the men available are not sufficient, the railway shall employ such other men as are considered necessary, and when the extra men thus obtained are sufficientiy numerous, the regular empioyes may be returned to their usual occupations. In this connection, any fire starting within 300 ft. of the track shall be presumed to have started from the

railway, unless proof to the contrary is furnished.

For the violation of any of these regulations, the railway shall be liable to a penalty of $100 for each offence in addition to any other liability incurred. Any employe or party included in the regulations, and who fails to obey them, is subject to a penalty of $25 for each offence, in addition to his other liabilities.

Grand Trunk Railway Betterments, Construction, Etc.

Southern New England Ry.—The Governor of Massachusetts has signed the act of Legislature authorizing the building of an extension into Boston and other lines to connect with the projected extension to Providence, R.I.

The extensions proposed to be built in Vermont, New Hampshire, Massachusetts and Rhode Island total 208 miles, and will serve a rich agricultural and manufacturing district. The S.N.E. Ry. is a subsidiary of the Central Vermont Ry., and will have outlets to ocean ports at Boston, Mass., and Providence, R.I. The Central Vermont Ry. has an ocean port at New London, Conn., and the G.T.R., which owns the C.V. Ry., has an ocean port at Portland, Me.

The Boston line will branch off from the C.V. Ry. at Bellows Falls, on the Vermont-New Hampshire State line, and will be over 100 miles long. Preliminary surveys have been made, but the route is not yet finally determined. The contract for the line to the Rhode Island boundary at Woonsocket, R.I., has been let to J. Marsh, Chicago, Ill.; and that for the line to Providence has been let to the O'Brien Construction Co., New York.

We are officially advised that G. M. Thompson has been appointed engineer in charge of surveys for the section of the projected lines of this company in the state of New Hampshire.

Montreal Track Elevation.—The Chief Engineer estimates that the proposed track elevation will cost over $1,000,000 in excess of the amount originally proposed, when the city of Montreal undertook to contribute $200,000 towards it. The company is asking for an increased contribution, which the city council is opposing. A proposition has been submitted to the board of control with a view of having the tracks depressed instead of elevated, with subways at the street crossings, and it is contended that this plan will cost less than the original estimate for the elevation.

Ottawa Station and Hotel.—The new central station and hotel were opened to the public June 1.

Brockville Roundhouse.—A new roundhouse with 47 stalls is projected at Brockville, Ont. On its completion a new station will be built at the head of Buell St., according to press reports.

Toronto Union Station.—Workmen started work June 4, clearing the debris of the fire of 1904, on the site secured for the new union station. The real work of building the station will not be undertaken, however, according to a statement of Vice President Kelley, until the work of grade separation from Bathurst St. is well forward. The plans for this have been finally approved by the Board of Railway Commissioners, and arrangements are in progress for putting it in hand.

Woodstock-Sarnia Track Relaying.—We are officially advised that the track between Woodstock and Sarnia, Ont., is to be relaid with 100 lb. steel rails. (June, pg. 292.)

S. G. Ferguson, engineer, Intercolonial Ry., Chaudiere Jct., Que., in remitting his annual subscription, writes: "I consider The Railway and Marine World of great value and interest to us railway men."

C.P.R. Passenger Terminal and Office Facilities at Vancouver.

Plans have been prepared and work is now under way on extensive improvements in connection with the passenger terminal at Vancouver, B.C. The present passenger station, which is located at the foot of Granville St., near the shore line of Burrard Inlet, was built about 14 years ago, and except for minor alterations, is unchanged from its original plan. The general waiting room and ticket offices are at the street level, and the baggage room is on the track level, which is about 30 feet below the street.

Along the water front across the local freight yard tracks are located the steamship wharves. There are two large sheds on a jetty pier of recent construction used by the C.P.R. trans Pacific steamship lines; also five sheds adjoining the longitudinal wharves used by the C.P.R. Victoria, Seattle, Alaska and other steamship lines. Between the wharf sheds and the passenger tracks adjoining the passenger station certain of the freight tracks serve the several sheds, and other tracks are used for drilling and storage. The yard tracks extend along the harbor front about a mile and a half.

By reason of its favorable location and the transportation facilities afforded by C.P.R. enterprise, Vancouver has grown from a trading camp to a well established city with over 125,000 inhabitants in about 25 years time. All business lines are represented in the commercial field centreing at the city. Situated at the terminal of the first, and still the only, Canadian transcontinental railway on a fine natural harbor and with other favorable surroundings, its growth has been based on advantages which ensure continued growth and permanency, and there is every indication that its population will be not less than 300,000 at the end of the next decade. The past growth has rendered inadequate the present facilities for handling the C.P.R.'s terminal business and the general plan adopted has been designed to relieve the present congestion, as well as to provide for reasonable growth in the near future.

The general scheme embraces a passenger station and office building located on available land immediately east of the present passenger station. There will be four passenger tracks, with provision for more when required, separated by wide platforms, between the station and the present freight yard. The passenger tracks are to be raised about 5 ft. above the present track level to reduce the difference in level between the street and the tracks to about 25 ft.

In order to avoid an inconvenient grade crossing and delays to traffic between the city and steamship wharf a bridge on the line of Granville St. extended, is to pass over the passenger and freight tracks to the steamship pier and connect directly with passenger accommodations on the pier. An incline is also to be built leading from the west side of this bridge to the wharf, giving access to the lower deck of the pier and freight sheds and the water front. Another viaduct over the tracks is to be built on the line of Burrard St. extended northerly, with an incline giving access to the present trans Pacific pier and other portions of the water front.

The main entrance of the passenger station will be on Cordova St. with the main waiting room located centrally in the station on the street level. Ticket offices serving the several classes of railway and steamship passengers will be located at one end of the waiting room, and the baggage checking room, luncheon and dining room, parcel room, women's waiting room, men's smoking room, news booth, information booth and other facilities will be all placed immediately adjoining the main waiting room.

On the lower floors of the station will be the baggage rooms, express company's space, immigrants' rooms, supply rooms, and other station facilities not directly used by passengers. Stairways and lifts will connect the two levels of the station and also afford communication with the office floors above. A separate foot bridge will be carried over the passenger tracks directly connected with the waiting room at one end and with stairways leading to the track level, giving access to platforms without crossing tracks at grade. The track platforms will be 1,000 ft. long and will be covered with shelter sheds of the umbrella type. The platform adjoining the station will be used only for baggage express and supplies.

Above the public rooms of the station building the space will be devoted to the company's offices. The interior arrangement of the office space will be adapted for a unit system of sub-division; that is, each panel will have heating and lighting facilities so that partitions may be placed or removed at will in order to provide for changes in arrangement of office accommodations which may be desired from time to time.

The proposed steamship station on the pier will be a two level building, the upper floor being devoted to the passenger business and offices and the lower floor to freight, baggage and express. There will be double level gangways on the west side of the pier, which will be used for the Victoria and Seattle service, the lower gangway being used for freight and the upper for passengers; these gangways to be supported on floating pontoons to maintain the landing at a constant level with respect to the boats. On the passenger or upper level of the pier will be waiting rooms, ticket offices, baggage checking room, customs office and other conveniences. Separate rooms will be provided for outgoing and incoming passengers. Two tracks will be placed on the surface of the pier within the shed, and one track on the outside of the building for the direct handling of freight between cars and steamers.

The essence of the general design has been to secure easy lines of communication between the railway trains, steamers and the city. The traffic conditions at Vancouver are unusual as compared with other large terminals on account of the absence of suburban business. The aggregate number of trains is not large, but they are long and frequently are run in several sections and contain a number of classes of traffic.

The designs for the terminal have been prepared by Westinghouse, Church, Kerr and Co., New York and Montreal, in co-operation with C.P.R. officials, and the construction of the station and facilities is being carried out by the same organization.

Dominion Railway Subsidy Agreements.

The Dominion Government has entered into agreements with the following companies, under the act granting aid for the construction of railways:—

SOUTHAMPTON RY., May 14.—From Millville, N.B., to the St. John river, near Pokiok bridge, 13 miles.

DOMINION ATLANTIC RY., June 1.—From the main line to the Government pier or wharf at Canning, N.S., one mile.

JOLIETTE AND LAKE MANUAN COLONIZATION RY., June 11.—From Joliette, Que., to near Lake Manuan, 60 miles.

NORTH RY., June 12.—From near Montreal, to mileage 837 west of Moncton, N.B., on the National Transcontinental Ry., and from that point, northerly and northwesterly 300 miles.

FREDERICTON AND GRAND LAKE COAL AND RY. CO., June 13.—From Gibson, N.B., to near Minto, with a branch to Marysville, 35 miles.

Canadian Pacific Railway Construction, Betterments, Etc.

Quebec Terminals Proposals.—A modified propsal was submitted by the President to the Quebec city council, June 13, by which the company will accept 107,000 ft. on the south end of Victoria Park, instead of 225,000 ft., and in return give over to the city a portion of its property at Hare Point. The proposition is under consideration.

St. Martin's Jct. to Ste. Therese.—The Board of Railway Commissioners has authorized the opening for traffic of the second track on the main line between St. Martin's Jct. and Ste. Therese, Que., 7.22 miles.

Hull Station.—The President invited the Hull, Que., city council, June 4, to submit suggestions with regard to the new station which it is proposed to build there. The site selected is on Brewery St., at the junction of Frost St. and Chelsea Rd. It is proposed to utilize the old station for freight purposes only. Plans for submission to the C.P.R. are being prepared by the city engineer.

Ottawa Tunnel, etc.—The Minister of Railways recently stated that the Department would not decide upon the question of the proposed C.P.R. tunnel through the city for some time. In connection with this proposal it is reported that the C.P.R. has secured an option on the Russell House property.

Campbellford, Lake Ontario and Western Ry.—The Board of Railway Commissioners has authorized the making of a connection of this line under construction, with the C.P.R. Montreal-Toronto line at Glen Tay, Ont., and has approved of revised location plans from the point of the junction to mileage 2.08. The board has also approved of location plans for the line from mileage 58.5 to 68; from mileage 72 to 75.45; from 79.5 to the western boundary of Trenton; from mileage 106.7 to 123, and from mileage 140.63 to 147.89, all mileages being calculated from Glen Tay. It has also authorized the taking possession of certain portions of the right of way of the Canadian Northern Ontario Ry. at mileage 79.5.

Toronto Terminal Improvements.—In connection with the laying out of the old Government House site, etc., at Toronto, the Board of Railway Commissioners has authorized the company to make connections with the G.T.R., to take additional lands, and to divert lanes, near Clarence Square.

Islington-Weston Branch.—The Board of Railway Commissioners has dismissed the company's application to build a branch from Islington, on the Toronto-Windsor line, to Weston, on the Toronto-Owen Sound line. It is said that the project to build this line has been abandoned in favor of a line, which is now being surveyed, to connect the Hamilton-Guelph Jct.-Guelph line with the Owen Sound line near Bolton.

Collingwood Southern Ry.—C.P.R. surveyors were reported to be working in the vicinity of Litsa, Ont., June 13, on a line from Collingwood to a junction with the Toronto-Sudbury line.

Toronto-Owen Sound Line.—Press reports state that a resurvey of the line from Bolton to Owen Sound, Ont., is being made with a view of reducing gradients, and eliminating curves, notably the horseshoe curve at Caledon. We are officially advised that this is incorrect. The gradients on the section of the line from Toronto to Bolton Jct. were reduced, and a number of curves eliminated, at the time of the building of the line from Bolton Jct. to Sudbury.

Georgian Bay and Seaboard Ry.—A contract has been let to the John S. Metcalf Co., Montreal, for the erection of an addition to the grain elevator at Port McNicoll, Ont., the terminus of the line on Georgian Bay. The addition will have a storage capacity of 2,000,000 bush., and will be similar in construction to the main building.

Car Ferry at Fort William.—The C.P.R. has a car ferry barge in operation at Fort William, connecting with Island No. 1. A temporary track has been laid from the city yards to the banks of the Kaministikwia River, and the ferry is used for the transfer of cars of construction plant and material.

Freight Yards at North Transcona, Man.—We are officially advised that the contract for the erection of a 1,000,000 bush. grain elevator, with cleaning facilities, has been let to the Barnett, McQueen Co., Minneapolis, Minn. The elevator is to be built of reinforced concrete throughout. It will have a capacity for receiving, cleaning and loading out to cars at the rate of 12 cars an hour, and a drying capacity of 1,000 bush. an hour. It will contain 140 bins, so that the individuality of cars of grain could, to a large extent, be maintained in passing through it. The general arrangement of the plant will admit of an increase of storage up to 15,000,000 bush., if required. The elevator will be operated by electricity.

Winnipeg-North Transcona—It is reported that in connection with the laying out of the new yards at North Transcona, Man., a new line will be built about a mile north of the Winnipeg limits. To carry the line, two subways across streets, and a new bridge across the Red River, would be required.

Gimli Branch Extension.—Tenders are being asked for the clearing of the right of way for the extension of the Gimli branch, from its present terminus at Gimli to the Icelandic River, Man.

Portage la Prairie-Brandon Second Track.—Vice President George Bury made an inspection of the second track work, now practically completed between those points, June 7. The Board of Railway Commissioners has authorized the opening for traffic of the second track from mileage 92.4 to 105.7 from Winnipeg.

Saskatoon Office Building. — Plans have been completed, and tenders are being asked for the erection of an office building on 2nd Avenue, Saskatoon, Sask., at an estimated cost of $200,000. The building will be four stories high, of steel, with stone and brick facings. The basement will be of full size, 50 by 148 ft. On the ground floor there will be ticket, telegraph, express and freight offices, and the three upper floors will be laid out in suites of offices.

Kerrobert Northeasterly.—The Board of Railway Commissioners has approved of location plans for the branch line northeasterly from Kerrobert, Sask., from mileage 20 to 36.09. This branch will connect with the branch line southerly from Wilkie, which is projected on the east side of Tramping Lake to Anglia. The contract for grading has been let to Dutton and Trenton, Winnipeg.

Weyburn-Lethbridge Line.—The western end of this line is being built as a branch of the Alberta Ry. and Irrigation Co.'s line, owned by the C.P.R., and starts at Stirling, from which point a branch runs westerly to Cardston. The route map as approved shows that the line will run almost due east for 36 miles. J. Timothy has the contract for 25 miles, and Foley, Welch and Stewart are building the line from the east. It is expected that track will be laid on a considerable mileage at the east as well as the west end this year.

Suffield Southwesterly.—In connection with the reported building of a line from Suffield, on the main line, to Kipp, between Lethbridge and Macleod, a contract was let early in the season (see R. and M.W., April, pg. 177) to the J. G. Hargrave Co., Winnipeg, for 25 miles, and construction was started at Suffield in a southwesterly direction.

Bassano Branch.—The Board of Railway Commissioners has approved of revised location plans for the proposed branch from Bassano, Alta., for 35.39 miles in tp. 3, range 22 to 25, west of the 4th meridian.

Track Revision, Gleichen to Shepherd.—The Board of Railway Commissioners has aprpoved plans for the revision of the line from Gleichen to Shepherd, Alta., mileage 0 to 16.

Alberta Central Ry.—The Board of Railway Commissioners has authorized the building of a bridge over the trail at Rocky Mountain House, Alta., and the diversion of the trail.

Strathcona-Edmonton Line. — The Board of Railway Commissioners has authorized the crossing of the Saskatchewan Ave., Edmonton, Alta., by an overhead bridge, and the crossing of Hardisty Ave., on the level. This is the extension of the line from Strathcona into Edmonton, for which the high level bridge is being built across the Saskatchewan River.

Edmonton Office Building.—A contract is reported let to C. W. Sharpe and Son, Winnipeg, for the erection of an office building in Edmonton, Alta., the estimated cost of which is $300,000.

Double Track Work in the Rocky Mountains.—Sir Thos. G. Shaughnessy, President, is quoted as stating, June 11, that surveys were to be started at once for a second track through the Rocky and Selkirk Mountains. It was estimated roughly that the work would cost $60,000,000.

Kaslo and Slocan Ry.—We are officially advised that the C.P.R. has agreed with the B.C. Government to reconstruct prior to Dec. 31, 1913, the K. and S. Ry. from Kaslo to Bear Creek, B.C. The line is a narrow gauge one, and it is to be made standard. The contract with the B.C. Government calls for the effectual maintenance and continued operation of the line as part of the C.P.R. system.

The line was taken over by the C.P.R. at the end of May, the officers and directors being as follows:—President, Geo. Bury; Vice President, J. S. Dennis; Secretary Treasurer, G. A. Walker, C.P.R. Solicitor, Calgary; other directors, T. Heeney, Calgary, and C. L. Stephenson, Kaslo.

The spur line from Three Forks to Bear Lake, which the C.P.R. has under construction, will connect with the K. and S. Ry. The contractors, Anderson and Co., have the grading nearly completed, and are having a connection made with the Sandon spur in order to get in material for the Seaton Creek bridge.

Vancouver Station, etc.—The Board of Railway Commisisoners has approved of change in location of the station at Vancouver. The new building, according to a statement attributed to F. W. Peters, General Superintendent, will cost about $1,000,000; the overhead viaducts to the docks, and the additions to the docks, will cost an additional $1,500,000. The site of the new station will be just east of, and including a portion of the present building. The contract has been let to the Westinghouse, Church, Kerr Co., New York, and preliminary operations were expected to be started by June 30. The building will be six stories in height, four of which will be above the Cordova St. level. In connection with the station building there will be an overhead bridge carrying Granville St. right across the tracks to the new and enlarged docks. The agreement in connection with these matters was approved by the city council, May 30. It also provides for the building of bridges across the tracks to the waterfront at George

Harris St., at Dunsmuir St., and a subway at Carral Ave., in conjunction with the city.

Branch in North Vancouver.—The Board of Railway Commissioners has approved location plan for a line from mileage 115, Cascades subdivision, along the north shore of Burrard Inlet, to North Vancouver, 21 miles. (June, pg. 290.)

Traffic Orders by the Board of Railway Commissioners.

The dates given for orders are those on which the hearings took place, and not those on which the orders were issued:—

Rates on Coke from Hamilton and Toronto.

16453. May 6. Re complaint of Consumers Gas Co. of Toronto complaining that rates on gas house coke from Buffalo to Hamilton, Brantford and Toronto create an unjust discrimination in favor of Buffalo and against Toronto. It is ordered that the railway companies charge the following rates on coke per net ton in carloads of the minimum Hamilton to Toronto, Brantford and Bridgeburg, 50c; from Toronto to Hamilton, 50c; from Toronto to Brantford, 60c; from Toronto to Bridgeburg, $1; and that the tariffs containing the said rates be published and filed to become effective not later than June 1, 1912.

Order 16707, June 4, amended order 16453, by substituting 40,000 lbs. for 30,000 lbs.

Classification of Gramophones.

16479. May 10. Re application of Berliner Gramophone Co., Ltd., of Montreal, for an order directing railway companies to add gramophones, boxed, to the musical instruments list in Canadian freight classification. It is ordered that in the Canadian freight classification the following articles be transferred from their present positions to the "musical instruments list," and that they be also included in the second class rating applicable to "Musical instruments, all kinds, not otherwise specified, carloads, minimum 12,000 lbs., viz.—Gramophones, graphophones, phonographs, records.

Order 16705, June 5, prescribes that order 16479 take effect, July 15.

Victoria and Sidney Railway Freight Tariff.

16507. May 13. Re application of Great Northern Ry. Co., under sec. 327 of the Railway Act, for the approval of its standard freight tariff of maximum tolls to apply on the Victoria and Sidney Ry. It is ordered that, pending the Board's decision in the enquiry into the tolls of railway companies in British Columbia generally, the applicant company's said tariff be approved.

Grand Trunk Pacific Railway Freight Tariff.

16528. May 15. Re application of Grand Trunk Pacific Ry. under sec. 327 of the Railway Act, for the approval of its standard freight mileage tariff C.R.C. 9, to apply from Prince Rupert east 170 miles to Carnaby, cancelling tariff C.R.C. 8. It is ordered that the said tariff, specifying the maximum mileage tolls to be charged for each class of the Canadian freight classification for all distances covered by the company's railway up to 170 miles, between and including Prince Rupert and Carnaby, be temporarily approved pending the result of the Board's enquiry into the rates charged generally by the railway companies west of and including Crow's Nest, Canmore, and Thornton; the said tariff to include and supersede the company's standard freight mileage tariff C.R.C. 8, approved by order 14524, Aug. 8, 1911.

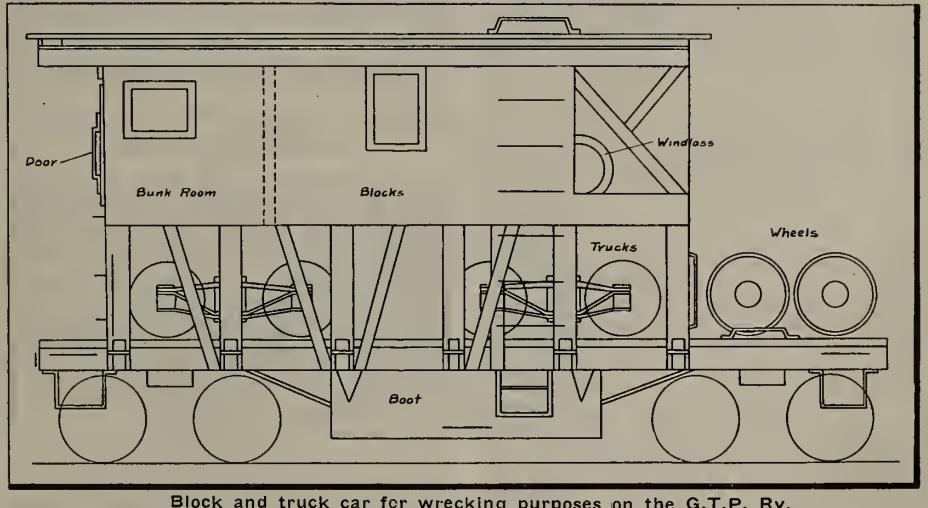
Quebec Oriental Ry.—A meeting of the holders of 5% first and second mortgage gold bonds on the Matapedia section of the line is to be held, July 18, to authorize the creation of £50,000 of prior lien mortgage gold bonds or other security to rank in priority to the existing bonds.

Block and Truck Car for Wrecking on the Grand Trunk Pacific Ry.

The block and truck car for wrecking purposes shown in the accompanying illustration was designed by John B. Shelton, Car Foreman, G.T.P.R. shops, Transcona, Man, and since being put in service has proved its merits.

In the first place, a common flat car was used, erecting thereon heavy posts, braces and rods. The upper deck of the superstructure is used for wrecking blocks, with one end of this floor partitioned off to form a 6 x 9 ft. bunk room, containing two bunks, providing ample room for four men. In this room, which is 5 ft. high, there is also a provision closet and stove.

Under this upper deck, on the surface of the flat car, there is a store of trucks and wheels, which can be unloaded from either end of the car by the use of the windlass and rope. Between the wheels, there is room for a supply of steel rails and wrecking chains. In addition to this storage space and the store on the upper deck, a boot has been added, suspended from the sills under the car, in which are kept oil boxes, journal bearings, dope buckets, packing hooks and various other articles required by a repair car.



Block and truck car for wrecking purposes on the G.T.P. Ry.

Securely fastened along each side of the car is a supply of heavy wire cables. In addition, the car is supplied with climbing ladders, sill steps, grab irons, uncoupling levers, etc., conforming with the Board of Railway Commissioners' requirements for safety appliances.

The windlass is geared, and has two 18 in. cranks, giving a sweep of 36 ins. Two men can thus unload a pair of trucks with ease, and, by the same arrangement, the car men can load defective trucks or wheels without the delay attendant on the use of a locomotive, which would block the track to passing trains and others that are required in the work of clearing the wreck.

Mr. Shelton resigned from the G.T.P.R. service since the above information was furnished us and has been appointed Car Foreman, C.P.R., at Moose Jaw, Sask.

B. J. Coghlin Co., Ltd., manufacturers of railway rolling stock springs, track tools, tie plates, etc., Montreal, whose factory has been on its present site since 1863, have bought a large block of land on Ontario St. East, between Davidson and Darling Streets, and have let contracts for the erection of a large factory and office building, which will double their present capacity. They will also put up a large warehouse for steel and have ordered considerable new machinery.

Automatic Block Signals on the Grand Trunk Railway.

The G.T.R. is installing an automatic block signal system on its western division in Indiana, as follows:—Maynard to Sedley, double track, 20 miles; Valparaiso to Grangers, double track, 55 miles; Valparaiso to Sedley, single track, 5 miles; Olivers to St. Joe River, single track, 2 miles.

On double track the signals will be automatic, bottom post, pull clear, three position type, operating in the upper quadrant and arranged to be worked "normal clear." On single track the system will be controlled manual with continuous track circuits. All the signals will be power operated. The materials and specifications will conform to the Railway Signal Association standards throughout. The type of signal to be used is the three position, normal clear, the semaphore indications being in the upper right quadrant. All the signals are to be power operated. Where the G.T.R. is crossed by other railways, interlocking plants are in service, but improvements are to be made to these which will become an integral part of the signal system. They will be equipped with power operated signals route locking, calling on arms, and tower indicators, which will give an advance indication of the approach of trains. Switch boxes will be installed on all switches and derails leading off the main line; while switch indicators of normal danger type are to be installed on all main line switches. The two short stretches of single track between Olivers and Studebaker and between Valparaiso and Sedley respectively will be operated and controlled by manual system with track circuit. Metallic signal blades will be used entirely. It is proposed to combine into one signal the automatic and bea morder functions where possible to do so. Double track junctions will be locked into the controlled manual circuit to facilitate the movement of trains entering the single track, and minimize the hazard. The spacing of the signals will approximate two miles. This spacing, of course, is modified for gradient, curvature, location of crossings and other physical features.

It is expected that the sections between Maynard and Sedley and Valparaiso and Sedley will be completed by Sept. 1, and the balance by Dec. 1. The Hall Signal Co. has the contract.

The installation of similar signalling between Toronto and Niagara Falls is contemplated, but up to June 17 it had not been authorized.

Railway Rolling Stock Notes.

The Canadian Northern Ry. has ordered two cafe-parlor cars, and six sleeping cars in the U.S.

The Intercolonial Ry. has ordered 50 box cars, 60,000 lbs. capacity, to be built at its Moncton shops.

F. H. Hopkins and Co., Montreal, have ordered two 30 ton Lidgerwood flat cars from the Canadian Car and Foundry Co.

The Dominion Iron and Steel Co. has ordered 10 limestone cars from the Canadian Car and Foundry Co., Montreal.

The Quebec Central Ry. has received two consolidation locomotives from the Canadian Locomotive Co., Kingston, Ont.

Press reports state that a private car for use by members of the Dominion Government has arrived in Ottawa from Dayton, Ohio.

The Temiskaming and Northern Ontario Ry. has received four consolidation locomotives from the Canadian Locomotive Co., Kingston, Ont.

The Reid Newfoundland Co. recently placed in service the fourth locomotive built in its shops at St. John's, Nfld. Four more of the same type are being built there.

The G.T.R. recently received two Pacific type passenger locomotives, Nos. 223 and 224, one first class car and three baggage cars, from its Montreal shops; 543 box cars, five first class cars and three baggage cars, from the U.S.

The G.T. Pacific Ry. has received five first class cars, nos. 2044, 2050 to 2053; three second class cars, nos. 1018 to 1020; five tourist cars, nos. 3405 to 3409, and 47 ballast cars, nos. 392700 to 392746, from the Canadian Car and Foundry Co.

The Esquimalt and Nanaimo Ry.'s 60 logging cars, which the C.P.R. recently ordered for operation on the E. and N.R. Cowichan Lake branch, will be of 80,000 lbs. capacity, 42 ft. long, M.C.B. standard flat cars, equipped with log bunks, etc.

Daily press reports early in June stated that the C.P.R. was in the market for 250 locomotives and for from 20,000 to 25,000 cars, and a few days later similar reports stated that additional orders had been given for 300 locomotives and 12,500 freight cars. We were officially advised June 13 that there was absolutely nothing in the reports.

The C.P.R., between May 13 and June 17, placed orders for additional rolling stock, as follows—nine stock cars, five refrigerator cars, two flat cars, one flanger and five vans, at its Angus shops, Montreal; four Jordan spreaders and 16 ballast ploughs, with F. H. Hopkins and Co., Montreal; one Lidgerwood unloader, with Allis-Chalmers-Bullock, Ltd., and two wrecking cranes in the U.S.

The G.T.R. has ordered 41 Pacific type passenger locomotives, 4-6-2-S., with superheaters, cylinders 23 by 28 ins., total weight in working order 223,000 lbs., driving wheels, for 31 locomotives, 69 ins., diar., and for remainder, 73 ins. diar., from the Montreal Locomotive Works. We are also advised that an order has been placed with the Baldwin Locomotive Co., Philadelphia, Pa., for 19 Pacific type passenger locomotives. These are in addition to 15 switching locomotives, ordered from the Canadian Locomotive Co., Kingston, Ont., details of which are given elsewhere under this heading.

Following is a list of the rolling stock which the Canadian Northern Ry. has ordered for delivery during this year, of which mention has already been made in our columns, the greater portion having been already delivered:—4,100 box cars, 2,500 delivered; 1,050 flat cars, 950 delivered; 400 Hart cars, all delivered; 70 cabooses, 20 delivered; six snow ploughs, all delivered; one rotary snow plough, delivered; 136 locomotives, 75 delivered; 82 passenger cars, 45 delivered; 35 mail and baggage cars, five delivered; four dining cars, all delivered; two cafe parlor cars, all delivered; 10 sleeping cars, nine delivered.

The Intercolonial Ry., between May 22 and June 18, received the following additions to rolling stock—five consolidation locomotives from the Canadian Locomotive Co., Kingston, Ont.; four first class cars from the Preston Car and Coach Co., Preston, Ont.; one postal car from the Nova Scotia Car Works, Halifax, N.S., and one dining and two sleeping cars from the Pullman Co.

The Canadian Northern Ry., between May 15 and June 15, received the following additions to rolling stock—one sleeping car, five first class cars, 200 box cars from the Canadian Car and Foundry Co.; one flat car, one baggage and mail car and nine baggage cars from the Crossen Car Co., Cobourg, Ont.; 275 box cars from the Nova Scotia Car Works, Halifax; two consolidation locomotives from the Canada Foundry Co., Toronto, and six flat cars.

The C.P.R., between May 13 and June 17, received the following additions to rolling stock—92 box cars, 97 refrigerator cars, 121 stock cars, 23 vans, four sleeping cars, six observation cars, 14 first class cars, seven first class and smoking cars, one steel first class car, two mail and express cars and two second class cars from its Angus shops, Montreal; 474 box cars, 263 flat cars and five coal cars from the Canadian Car and Foundry Co.; 10 Rodger ballast spreaders from F. H. Hopkins and Co., Montreal; 35 stone cars from the Nova Scotia Car Works, Halifax, N.S.; 351 box cars from the American Car and Foundry Co.; 10 sleeping cars, and one wrecking car from the U.S.

A VICE PRESIDENT AND GENERAL MANAGER'S OPINION.

Morley Donaldson, M. Can. Soc. C.E., who has been appointed Vice President and General Manager of the Grand Trunk Pacific Ry., has been a subscriber to The Railway and Marine World for a number of years.

A short time ago he wrote in regard to it as follows:—

"I have always read The Railway and Marine World with pleasure and believe it to be a necessity in our Canadian railway life. I find the news accurate and complete in details we all want to know. If continued in its present form its future success is assured."

O'Brien and Martin, railway contractors, Cochrane, Ont., have ordered 23 Hart convertible ballast and construction cars from the Hart-Otis Car Co., Montreal. Following are the chief dimensions:—

Length over end sills	36 ft. 8 ins.
Width over side sills	8 ft. 10 ins.
Length inside as hoppers	20 ft. 10 ins.
Length inside as gondolas	34 ft. 8 ins.
Width inside	8 ft. 8 ins.
Width over all	10 ft. 2½ ins.
Width at top	9 ft. 10 ins.
Height from rail to floor	4 ft. 4⅛ ins.
Height from rail to top of car	8 ft. 1⅜ ins.
Height inside	3 ft. 9¼ ins.
Truck centres	26 ft. 8 ins.
Wheel base of truck	5 ft. 4 ins.
Length of hopper door opening	16 ft. 8½ ins.
Width of hopper door opening	2 ft.

Following are chief details of the 15 six wheel switching locomotives which the G.T.R. is having built by the Canadian Locomotive Co., Kingston, Ont.

Weight in working order	139,500 lbs.
Wheel base	12 ft. 8 ins.
Heating surface, fire box	148 sq. ft.
Heating surface, tubes	1,772 sq. ft.
Heating surface, total	1,920 sq. ft.
Driving wheels, diar.	56 ins.
Driving wheel centres	Cast steel
Driving journals, diar. and length	9½ by 12 ins.
Cylinders, diar. and stroke	20 by 26 ins.
Boiler, type	Radial stayed
Boiler, working pressure	190 lbs.
Tubes, No. and diar.	264—2 in.
Tubes, length	12 ft. 9½ ins.
Brakes	Westinghouse E. T. 6
Weight of tender, loaded	108,500 lbs.
Tank, capacity	5,500 U.S. gals.
Tank, type	Sloping back
Coal capacity	8 tons
Truck, type	Arch bar
Wheels, diar.	33 ins. M.C.B.
Journals	5 by 9 ins.
Brake beam	G.T.R. standard

Canadian Northern Railway Earnings, Etc.

Gross earnings, working expenses, net profits, increases or decreases, compared with those for 1910-11, from July 1, 1911:—

	Earnings.	Expenses.	Net Earnings.	Net Increase
July	$1,475,900	$1,114,300	$361,600	$13,400
Aug.	1,420,600	1,105,900	314,700	51,700
Sept.	1,576,400	1,157,000	419,400	38,200
Oct.	2,028,900	1,348,800	680,400	99,900
Nov.	2,001,500	1,336,300	665,200	106.300
Dec.	1,831,400	1,327,600	503,800	144,600
Jan.	1,223,100	1,004,400	223,706	122,000
Feb.	1,203,400	965,800	237,600	101,800
Mar.	1,572,700	1,145,900	426,800	72,000
Apr.	1,608,100	1,205,000	403,100	42,000
	$15,947,000	$11,710,700	$4,236,300	$791,900
Inc	$ 3,658,700	$2,866,800	$ 791,900	.....

Approximate gross earnings for May, $1,822,100, against $1,445,600, for May, 1911.

Average mileage operated, 3,838 miles, against 3,351 miles for the 1911 period.

Canadian Pacific Railway Earnings, Etc.

Gross earnings, working expenses, net profits, increases or decreases, compared with those for 1910-11, from July 1, 1911:

	Earnings.	Expenses.	Net Profits.	Net Increases.
July	$ 9,661,818.14	$5,958,789.81	$3,703,028.33	$218,408.74
Aug.	10,421,904.42	6,346,333.41	4,075,571.01	383,898.68
Sept.	10,049,084.97	6,131,638.17	3,917,446.80	5,847.16
Oct.	11,207,991.99	6,526,887.24	4,631,104.75	175,944.23
Nov.	10,570,694.80	6,583,328.31	3,987,366.46	250,244.28
Dec.	10,654,871.67	6,549,141.41	4,105,730.26	819,196.37
Jan.	7,328,781.81	6,245,924.11	1,082,857.70	426,739.83
Feb.	8,931,907.20	6,548,040.53	2,338,866.671	239,159.16
Mar.	10,519,328.76	6,800,317.65	2,718,401.11	561,834.57
Apr.	11,301,349.46	7,185,597.67	4,115,751.79	958,777.18
	$100,647,723.22	$64,876,598.31	$35,771,124.91	$5,040,050.15
Inc.	15,271,622.54	$10,231,572.39	$ 5,040,050.15	.....

Approximate gross earnings for May, $11,133,000, against $9,111,000 for May, 1911.

Grand Trunk Railway Earnings, Etc.

Following are the earnings of the G.T.R., C.A.R., G.T. Western Ry., and D.G.H. and M. Ry., for April, as compared with those for April, 1911:—

GRAND TRUNK RAILWAY.

	1912.	1911.
Earnings	$3,199,400	$2,879,144
Expenses	2,283,600	1,975,272
Net earnings	$ 915,800	$ 903,872

CANADA ATLANTIC RAILWAY.

	1912.	1911.
Earnings	$179,400	$169,963
Expenses	149,200	153,405
Net earnings	$30,200	$16,588

GRAND TRUNK WESTERN RAILWAY.

	1912.	1911.
Earnings	$582,600	$503,071
Expenses	484,600	461,189
Net earnings	$98,000	$41,882

DETROIT, GRAND HAVEN AND MILWAUKEE RY.

	1912.	1911.
Earnings	$175,500	$146,587
Expenses	168,100	149,509
Net earnings	$ 7,400	*$ 2,922

* Deficit.

Approximate gross earnings for May, $4,303,374, against $3,942,055 for May, 1911.

TRAFFIC RECEIPTS OF THE SYSTEM.

Aggregate from Jan. 1 to May 31.

	1912.	1911.	Inc.
G. T. R.	$14,868,816	$13,790,038	$1,078,778
C. A. R.	841,288	797,414	43,874
G. T. W. R.	2,676,727	2,690,305	*13,578
D.G.H. & M.R.	828,256	818,199	10,057
Totals.	$19,215,087	$18,095,956	$1,119,131

Embankments and Foundations on the Toronto-Sudbury Branch C.P.R.

By A. C. Oxley, A.M. Can. Soc. C.E.

The C.P.R.'s Toronto-Sudbury branch was built in the years 1905-1909, and as the standards were of a very high type they may contain some points of interest. No curves over 4° were allowed, and the grades were limited to 3-10% compensated. These grades were successfully maintained, with the exception of a pusher grade of 8-10%, for some miles near Tottenham, mile 37. This difficulty will eventually be obviated when traffic demands it, by the substitution for freight purposes of 8 miles of 3-10% track for the present 3 miles of 8-10%. Velocity grades were allowed within the limits of 10 and 30 miles per hour for freight trains.

The intention was to insure a thoroughly solid road bed, rather than to keep initial expenses at a minimum, and as the greater part of the 225 miles runs through a rock and muskeg country, there was frequently some difficulty in attaining this result. This article, however, will deal only with the district between miles 22 and 182, north from West Toronto, from Bolton to Byng Inlet, as this was the part with which the writer became personally familiar during his four years' experience on the work.

The line may be divided into two sections, viz., the earth district and the rock district; the first running from mile 22 to 92, and the second north from mile 92 to 248.

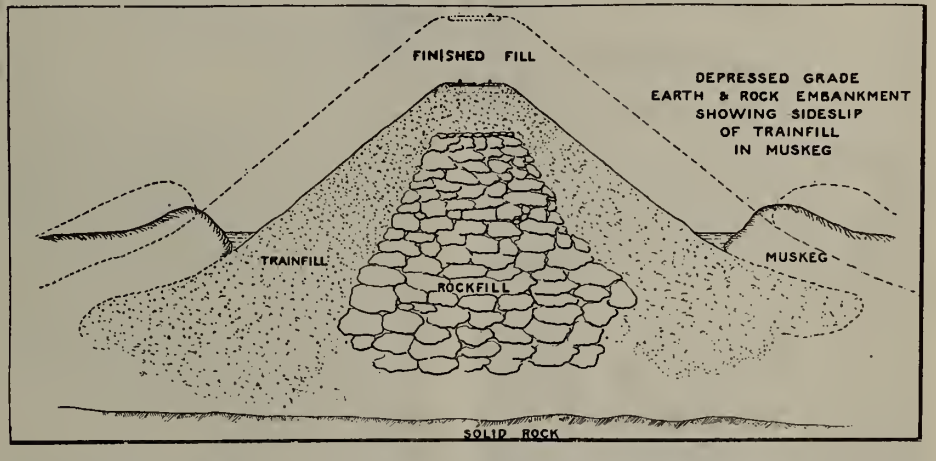
On the south, or earth section, little difficulty was encountered either with foundations or embankments. Eventually all streams and gulleys will be bridged either by steel viaducts, or by concrete arches and embankments, but at the time a number of permanent timber trestles were built, several of them containing an average of 500,000 f.b.m. The bent of these trestles rested on piles driven to an average depth of 20 ft. or more, and the only settlement that has occurred has been on the ends of the trestles, where the bents rested on mud sills on the made embankment.

A curious instance of an over refinement of engineering occurred at the Nottawasaga River trestle. The trestle is about 700 feet long with a maximum height of 110 ft., and is located on the short tangent between two reverse curves. The trestle itself has an average elevation of 10 or 15 ft. below the general track elevation in the immediate vicinity. This is overcome by the use of 2,000 ft. of velocity grade of 6 or 7-10%, resulting in a high rate of speed for the consolidated locomotive that passes over it. This will easily be remedied, however, when the trestle is replaced by a steel viaduct, either by building the viaduct higher or by slightly reducing the little summits adjacent to it. The curves also may be somewhat lessened by turning the new viaduct in a direction more nearly parallel with the tangents.

In the earth section water openings were either concrete or glazed tile pipes for small drainage areas, with concrete arches for the larger ones. The pipes, on the whole, were very satisfactory, except that in a number of instances insufficient allowance had been made for their becoming reduced in area by being partially filled with water-washed sand; it was therefore necessary, under these circumstances, to replace 18 or 24-in. pipes with 4 ft- arches. The rule was to camber as high as the drop would allow, and the adjustment of the soil under the embankment was usually sufficient to take out quite a large curve, as shrinkage seemed to be due not only to settling of the deposited embankment, but chiefly to the sagging of even firm clay in such a way as to cause a low spot in a pipe laid flat, and the consequent tendency of the pipe to clog. The culverts were the standard 1905 and 1906 types of concrete arches made in 20 ft. sections, to allow settlement. Piles were used in exceptional cases, a row under each side, but the general practice was to divert the stream far enough to secure firm soil.

In the rock soil, practically all openings of 8 ft. or less were built up of the excavated rock and laid without mortar, those over 4 ft. in width being made double, with the top constructed of flat lintel stones. These proved entirely satisfactory in the great majority of cases, as they were laid on solid rock a little to one side of the original stream.

We will now proceed to deal with the rock section, discussing particular points in the order of their mileage from the south end. At mile 102, near Buckskin, a rock embankment about 10 ft. high crossed a fairly dry muskeg, in which the rock was about 50 or 60 ft. down. No cross waying was ever permitted, as the intention was to have the rock embankment cut its way through the thin mattress of the dry surface of the muskeg; in this case the rock remained on the surface for about a year, and then gave way during train filling. Some time was spent in filling it, as its depth allowed the train gravel to move sideways, but eventually bottom was reached after 3,000 Hart car loads of gravel had been placed in it. The only real objection to its sinking, when it did, was that the gravel used was high grade surface gravel which had to be hauled about 40 miles, as track laying had not then proceeded far enough to reach the more northerly, and thus more convenient, sand pits.



The only midway divisional point was at Muskoka, mile 126 from West Toronto. As this point was in the rock district the grading for it was rather heavy, the finished yard occupying an area, apart from the main pass siding of about 3,000 x 300 ft., much of which was solid rock that had to be lowered about 10 ft. Water was obtained from the near by Stewart Lake, but, as it is not allowable to pollute the Muskoka waters, the sewers had to drain into the swamp on the other side of the track.

The general mode of procedure through the rock country was to make the rock cut only about a third of the embankment, as this quantity of rock would have sufficient weight to cut its way vertically through the mattress, and as soon as bottom was reached the remainder could be made by train filling. The efficiency of this method of forcing the sink holes through is shown by the fact that, train filling once completed, the percentage of derailments has been at least as low on this new road bed as on that of sections 20 years old or more. This brings up an important question. If the intention is to have the weight of the rock cut its way through the mattress, and as it is only when it has done so and reached solid bottom that the earth filling becomes really effective, would it not be advisable, in some instances, before placing the rock fill, to cut right through the mattress parallel to the centre line, for instance, in the case of a thirty foot embankment, to cut two longitudinal ditches 40 ft. apart, and thus allow that whole section to sink vertically without deforming the surface at the side. Almost every case of deformation is caused by the sand or gravel floating sideways, and it does not become solid for some time.

Depressed temporary grades of 3% were allowed. In many cases small hillocks of rock were cut away to allow the temporary grades to descend to the centre of the larger gulleys.

At mile 124, during train filling, a low rock embankment, while carrying a locomotive, gave way suddenly, and the locomotive sank with such force as to shear the nuts in the track for 1,000 ft. or more. Between miles 112 and 142 a number of embankments were train filled from temporary trestles, and little trouble was experienced, although in many cases it was found necessary to lower the level of adjacent small lakes in order to give more solid bearing to the toes of the slopes.

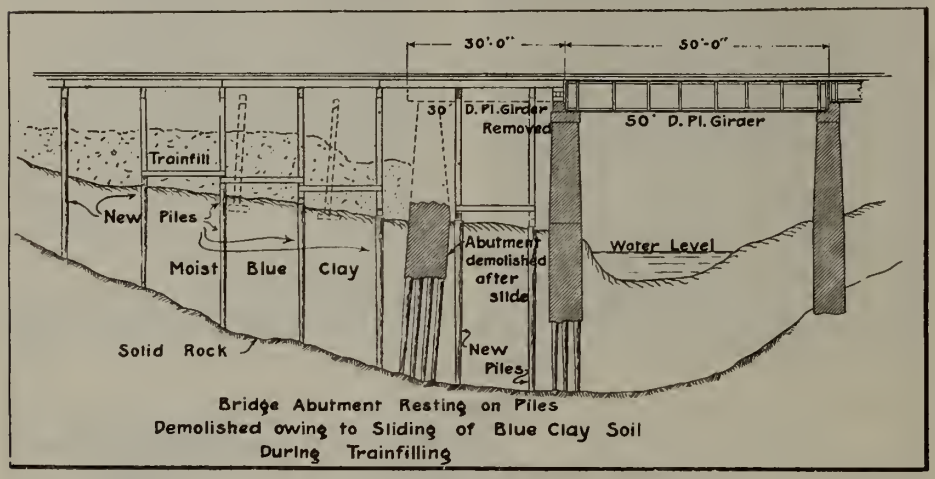
At Richmond Lake, mile 101, south from Romford, the lake level was about 50 or 60 ft. below the level of the track. A rock embankment rested firmly on the solid rock below, but was not carried up to grade, a trestle being used above water level. The water would probably seep through the rock fill, but, in the event of its not doing so, it would easily flow through the trestle at high water. At mile 76, south from Romford, occurred one of the heaviest train fills of the line, the depressed grade being 25 ft. at a maximum below the final grade, and as it was necessary in filling to cover the toes of a rock embankment up to 30 ft. in height, at least 250,000 yards of earth must have been used in this half mile of fill.

At mile 75.5, south from Romford, a temporary trestle beside a lake had been train filled, but the water had apparently dissolved the embankment and caused lateral slipping. The lake was small, and the lowering of its level about 4 ft. left the toe dry and firm.

In many instances where a comparatively dry muskeg was to be crossed, provision was made for thickening the dry supporting mattress by ditching and lowering the level of the water table. This was generally effective, provided there was solid soil in the mattress, but not invariably. At mile 70.5 from Romford, the track crossed a muskeg about 2,000 ft. long and from 20 to 40 ft. deep, with an embankment when completed about 4 ft. high. A drainage ditch was dug, leaving the water table only about 4 ft. below the level of the surface soil. The track crept very badly and made

sun kinks, elevations taken during the passage of a train showing track undulations of one or two tenths. The track was made safe for traffic and prevented from creeping by the substitution of 14-ft. bridge ties; later it was diverted to a side hill of solid rock and made thoroughly solid.

At mile 66.7, south, in order to make secure a muskeg, which for its length gave considerable trouble, a depressed grade was built, with a rock embankment about 10 ft. high, the lowest point of which was a maximum of about 20 ft. below the intended finished grade. In this case, although soundings showed a depth of 50 ft. or more to bed rock, the weight of the rock embankment was not in itself sufficient to slice through the surface mattress. This was somewhat unfortunate, as it was always



Bridge Abutment Resting on Piles Demolished owing to Sliding of Blue Clay Soil During Trainfilling

found that although earth alone would eventually reach a firm foundation, yet, owing to its specific gravity being so low, it had a greater tendency when placed by train filling, to move horizontally rather than vertically, causing the mattress to bulge upwards for some distance out from the toes of the slope.

The writer was not present until the completion of the filling of this sink hole, but although it had a length of only 600 ft., and had to be lifted to a height of 20 ft. above the depressed grade, a fill of 30,000 yards had raised it only 3 ft. Fortunately, by the use of spreaders, the embankment while sinking retained a good surface and alignment, and no difficulty was experienced in running passenger trains over this temporary velocity grade.

The next large fill occurred at the crossing of the Magnetawan River, the valley of which is about 3,000 ft. wide. With the exception of three girder spans this valley was crossed by a timber trestle about 40 ft. high. In this case the length of the trestle helped to reduce the unit cost of filling, as it was possible to fill from temporary grades placed on each side of the trestle, and thus leave the main line open for traffic.

On this 160 mile section, with two exceptions, there were no steel bridges larger than plate girders the exceptions were at the Severn River, where there was a 200-ft. through Pratt truss, and at Parry Sound, where there was a viaduct 1,700 ft. in length. The largest span consisted of two Howe deck trusses of 165 ft. span. In the earth district all concrete was carried below frost line and rested on piles; while in the rock country the piers in almost every case rested directly on the rock itself.

During the construction of the Parry Sound viaduct a simple method was adopted to eliminate delay. The track was paralleled at the points by the Canadian Northern Ontario Ry., and running rights, or rather haulage rights, were given by that railway over a four mile section through Parry Sound. In this way it was possible to lay some twenty miles of steel north of Parry Sound during the construction of the viaduct, at the same time leaving the bridge contractors a mile or more of blind main line for bridge yard purposes. The only difficulty occurred at one of the abutments at the South Nascoutyong River. In this case the abutment was carried to a depth of 10 or 15 ft. below the surface of the ground, and piles were then driven to bed rock, about 20 ft. further. Back of the abutment was a temporary trestle about 30 ft. high, resting on mud sills, the soil being an alluvial clay, which was kept moist by the presence of a stream less than 100 ft. away. No trouble was experienced with the abutment until train filling had proceeded for some time on the temporary trestle, when the earth filling caused a flow of the clay sub-soil, and, although the bases of the piles remained in their places on bed rock, the flowing of the clay caused the abutment to tilt forwards, necessitating its demolishment. No further attempt was then made to fill the embankment, but piles were driven and a trestle constructed, both in place of the temporary trestle, and also between the abutment and the next pier, the new trestle replacing a short girder span. In this case, even if the pier had been constructed just as it was, had piles for the temporary trestle been driven at once, the clay might possibly have been so firmly anchored that there would have been little, if any, horizontal movement.

The foregoing paper was read before the Canadian Society of Civil Engineers.

The Canadian Ticket Agents Association's annual meeting will be held in Ottawa, Oct. 9 and 10, instead of Oct. 8 and 9 as first arranged, thus obviating the necessity of staying over in Montreal for 30 hours, which would have been caused by the first arrangement. Ottawa will be left on the morning of Oct. 11, luncheon will be had at a hotel in Montreal; there will be afternoon tea on the Donaldson line s.s. Saturnia; the White Star Dominion line s.s. Laurentic will be boarded in the evening, and at daylight the party will leave Montreal for Quebec, where the members will disband.

Division Organization on C. P. R. Western Lines.

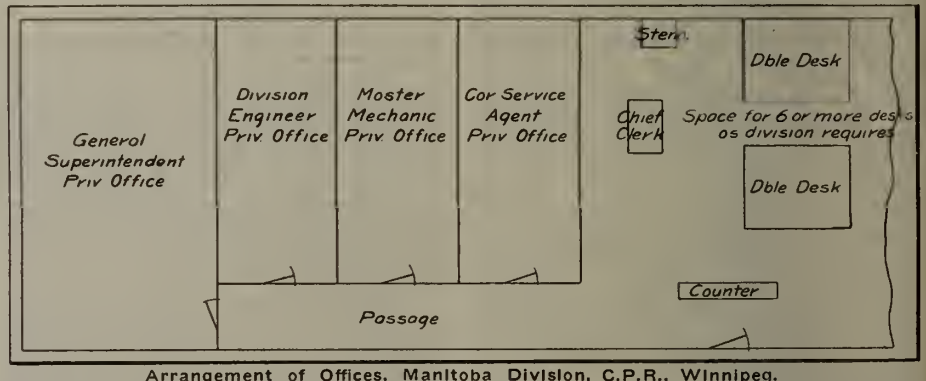
The organization of the operating and maintenance of way departments on the C.P.R. Western Lines is divisional, a system which is in force on the best operated railways in the United States. The difference between divisional and departmental organization is so well understood that it need not be dwelt on here.

To improve the ordinary divisional organization, the consolidation of the office work of the divisions and districts was arranged on the Western Lines.

The accompanying plan shows the layout of the General Superintendent's offices at Winnipeg, which may be regarded as typical. All the other grand divisions are arranged on the same principle, with the exception of the British Columbia division, which will be similarly arranged when the new station is built and the necessary room becomes available at Vancouver.

Under the old system the general superintendent had a separate staff, with a chief clerk in charge, the master mechanic, the divisional engineer and the car service agent, each had the same. Under the divisional organization, there is one clerical office for the general superintendent, divisional engineer, master mechanic and car service agent. All communications addressed to these several officers are opened in this general office, and are distributed to the various officers. This office organization is not only more economical in labor and stationery, but it gives the general superintendent greater control of his territory, eliminates red tape, minimizes office work, and enables the officers to spend more of their time on the line, and everyone knows that good operation is the result of the officers being out on the road as much as possible.

Under the old organization, if the general manager wrote to the general superintendent about a mechanical matter, the latter would, in turn, be required to write to the master mechanic, the master mechanic would write back to him, and he would in turn write to the general manager. This took time and stationery. Under the present system, letters coming to the general superintendent about mechanical, engineering and transportation matters are placed on his desk. He asks the respective officers to step in and discuss the matters, and he then hands the letters over to these officers, who call in a stenographer and dictate a reply to be signed by the general superintendent. This means that usually a letter is answered the same day as received.



Arrangement of Offices, Manitoba Division, C.P.R., Winnipeg.

The superintendent's offices on the Western Lines were also reorganized a little over a year ago. The superintendent, district master mechanic bridge and building master and road master's offices are located side by side, and they have one general office under one chief clerk and with one clerical staff.

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Established 1898.

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The Great Northern Railway's Policy in Canada.

C. R. Gray, the newly appointed President of the Great Northern Ry., is credited by a United States paper, Engineering News, with making the following statement:

"Millions of dollars are to be expended this year and next year in extending lines into the virgin territory of Washington and Oregon, and into the province of British Columbia. **The plan is to drain the rich grain fields of western Canada by means of north and south feeders.** Contracted work in eastern Washington to the Pacific coast will be rushed to completion, and additional contracts will be awarded soon for extensive development in northern Washington. Development of subsidiary lines in Oregon will be carried out by J. H. Young, the new President of the Spokane, Portland and Seattle Rd. and other Hill lines. The Northwest is our territory, and we are planning to strengthen our position in all parts of the western country."

Mr. Gray's statement that the Great Northern's intention "is to drain the rich grain fields of Western Canada by north and south feeders" is significant. Of course it has been a well known fact for some years, but this is the first public announcement of it by one of the company's officers.

The position, therefore, is that the Great Northern's policy is avowedly not to assist in building up Canada, but "to drain" it, and to attempt to follow President Taft's idea of making it "an adjunct."

Mr. Gray's statement deserves the most serious consideration by the Dominion Government, and in fact of everyone interested in Canadian development.

Four New Car Building Plants.

The ratepayers of Fort William, Ont., will on July 10 vote on a bylaw to give the Canadian Car and Foundry Co. 80 acres of land, $20,000 for building a dock and 10 years exemption from general taxation. We are officially advised that the company is ready to start work on its car building plant as soon as the ratepayers ratify the agreement entered into with the council.

W. W. Butler, Vice President, Canadian Car and Foundry Co., returned to Montreal from the Pacific coast about the middle of June, and confirmed the previous announcement that the company would establish a car building plant in British Columbia, and that it would turn out all wood, steel and steel and wood construction cars, and that there will probably be a small cast steel plant in conjunction with it.

The Eastern Car Co., Ltd., was organized recently at New Glasgow, N.S., the $2,500,000 of capital being quickly underwriten by the principal promoters, who are connected with the Nova Scotia Steel and Coal Co. The company will manufacture freight cars, including both steel underframe cars and complete steel cars. The plant will be built either at Trenton, adjoining the Nova Scotia Steel and Coal Co.'s plant, or in the adjoining town of New Glasgow. It will require a ground space of about eight acres, and some 10 miles of railway tracks will be built. It will have a capacity of from 25 to 50 cars a day, and will employ from 800 to 1,000 men H. H. Lane, late of the American Car and Foundry Co,, Detroit, Mich., has been appointed consulting engineer, to design and construct the plant, and we were advised on June 10 that the plans were well under way and that the early stages of construction would probably be commenced before the end of June.

The directors are the following officers of the Nova Scotia Steel and Coal Co.: R. E. Harris, President; Hon. J. D. McGregor, 1st Vice President; T. Cantley, 2nd Vice President and General Manager; J. C. McGregor and G. F. McKay, directors; R. E. Chambers, Mining Superintendent.

In the middle of June the public were offered $1,000,000 of the Eastern Car So.'s 1st mortgage 6% bonds at par and interest, payment of both principal and interest being guaranteed by the Nova Scotia Steel and Coal Co., and it was announced that the issue had been oversubscribed.

The Ontario and Western Car Co., which is promoted by F. B. McCurdy, F. M. Brown and J. M. McLeod, of Halifax, N.S., is going to erect a car building plant at Port Arthur, Ont. Plans are being prepared and the promoters state that construction will be commenced at an early date. Both passenger and freight cars will be built. Under the agreement with the city the plant is to have a capacity of 40 cars a day, the buildings, machinery, etc., are to cost not less than $1,250,000.

Second Track on C.P.R. Lake Superior Division.

We are officially advised that the C.P.R. has decided to start work on the second tracking of the Lake Superior Division of the main transcontinental line and has let a contract to the Dominion Construction Co., Toronto, for about 60 miles of the work. The contract includes grading, tracklaying and ballasting, which is to be completed and ready for operation in November. About 20 miles of the work will consist of siding extensions, to form part of the second track, and the balance will be distributed as follows:—Crete to Sudbury, 3.2 miles; Cartier to Gencon, 3.4 miles; Roberts to Lembro, 21.2 miles; Devon to Chapleau, 4.8 miles; White River to Tarpon, 3.5 miles; Hedge to Port Arthur, 4.1 miles.

The Dominion Construction Co. was incorporated under the Ontario Companies Act in April last, with an authorized capital of $150,000, the provisional directors being:—G. S. Deeks, T. R. Hinds, H. E. Williams, and T. F. Hinds, the two first named being President and Secretary-Treasurer respectively of the Toronto Construction Co., Ltd., railway contractors, which has carried out several other C.P.R. contracts. The same parties have the contract for the C.P.R.'s subsidiary line, the Campbellford, Lake Ontario and Western Ry., between Glentay and Agincourt, Ont.

The Construction of the Algoma Eastern Railway.

In the article on this subject, by R. S. McCormick, Chief Engineer, in The Railway and Marine World's June issue, the first paragraph was printed as follows:—

"The original charter for this railway, of 855 miles, now being completed from Sudbury to Little Current, on Manitoulin Island, Ont., was obtained by F. H. Clergue, at about the same time as the Algoma Central and Hudson Bay Ry. project was launched. A land grant and subsidy accompanied the granting of the charter."

The article as written stated that the distance covered in the original charter was 85 miles, but by mistake 855 was put in type, and, unfortunately, was overlooked in the proof reading.

Mainly About Transportation People.

HON J. D. HAZEN, Minister of Marine, sailed for England, June 26.

SIR THOS. G. SHAUGHNESSY returned to Montreal from England early in June.

JAS. ROSS, Montreal, has been elected a member of the Royal Yacht Squadron, Cowes, Isle of Wight, Eng.

R. H. DUFF, Resident Engineer, Mackenzie, Mann and Co., was married in Toronto, June 14, to Miss S. Neilson.

SIR MONTAGU and LADY ALLAN arrived in Montreal from England June 8, and will spend the summer at Cacouna, Que.

JAS. KENT, Manager, C.P.R. Telegraphs, left Montreal, June 12, for the west, on his annual inspection over the company's lines.

A. W. SMITHERS, Chairman, G.T.R. board, left Montreal, June 10, for Boston, Mass., whence he sailed for England.

JAS. DUNSMUIR, of Victoria, B.C., director, C.P.R., and Mrs. Dunsmuir, who are staying in England, have taken Bisham Abbey for a time.

G. BLACKBIRD, Locomotive Foreman, G.T.R., Richmond, Que., left early in June to spend two months' holiday in Europe, accompanied by Mrs. Blackbird.

H. TANDY, of Kingston, Ont., who has been a member of the American Railway Master Mechanics' Association since 1883, has been elected an honorary member.

T. KILPATRICK, Superintendent, C.P.R., Revelstoke, B.C., was the principal guest at a dinner given by the Vernon, B.C., Board of Trade, recently.

MRS. W. H. GRANT, wife of the manager of Construction, Mackenzie, Mann & Co., Ltd., Toronto, sailed for England on the s.s. Royal George, June 26.

LADY THOMAS TAIT and Miss Tait, who have been spending some time at Niagara-on-the-Lake, have gone to St. Andrew's, N.B., for the rest of the summer.

W. F. TYE, President, Canadian Society of Civil Engineers, and Mrs. Tye, who have been visiting Europe, are expected to return to Toronto early in July.

SIR WILLIAM MACKENZIE and Lady Mackenzie left Canada for England June 26. On their return they will probably be accompanied by Mrs. Scott Griffin and family.

J. DUNCAN and J. K. DUNCAN, C.P.R. ticket agents, Thamesville, Ont., and J. F. ROBERTS, C.P.R., ticket agent, Parkhill, Ont., have joined the Canadian Ticket Agents' Association.

The Countess Jacques de Lesseps, daughter of SIR WILLIAM MACKENZIE, with the Count and their son, arrived in Toronto, June 10, from France, and will spend the summer in Canada.

SIR DONALD MANN has given $1,000 towards the relief of the sufferers by the recent fire at Chicoutimi, Que. Relief supplies are being carried free by the Canadian Northern Ry. lines.

D. W. HAYES was presented with a quantity of silver by merchants of Guelph, Ont., June 13, on his transfer from G.T.R. freight agent there to a similar position at London, Ont.

E. WALTER RATHBUN, President of the Thousand Islands Ry. and other transportation lines, with headquarters at Deseronto, Ont., left there early in June, with Mrs. Rathbun, for England.

The body of LAWRENCE CHIPMAN, the Edmonton, Dunvegan and British Columbia Ry. engineer, who was drowned April 7, was found near Mirror Landing, on the Athabasca River, May 20.

T. R. CAMPBELL, Salishury, N.B., a subcontractor on the National Transcontinental Ry., was badly injured in the wreck of a construction train on the railway near McGiveney's, N.B., June 4.

MAJOR GEO. C. ROYCE, Manager, Toronto Suburban Ry., was officer commanding the 2nd Queen's Own Rifles of Canada, at the 6th district camp at Niagara, Ont., recently.

SIR WILLIAM VAN HORNE, with Lady and Miss Van Horne, and Mrs. R. B. Van Horne and family, left Montreal, about the middle of June, for their summer home, Coven Hoven, St. Andrews, N.B.

LORD STRATHCONA has given $10,000 to complete a fund of $100,000 for the establishment of a school for the English-speaking blind, proposed to be erected by the Montreal Association for the Blind.

J. J. HILL, Great Northern Ry., U.S.A., and a party of friends, are on a fishing trip on the St. Lawrence River and tributary waters. His yacht, Wascouta, arrived in Montreal, June 13, to take on the party.

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William Phillips,
European Traffic Manager, Canadian Northern Ry. and Canadian Northern Steamships, Ltd.

F. E. TRAUTMAN was presented with a purse of over $900, May 30, on his leaving Fort William, Ont., to take a position on the staff of Geo. Bury, Vice President and General Manager, C.P.R. Western Lines.

R. MARPOLE, General Executive Assistant, C.P.R., returned to Vancouver early in June, much benefitted by a holiday which he spent in California. There is no truth in the press report that he is about to retire.

F. L. WANKLYN, M. Can. Soc. C.E., General Executive Assistant, C.P.R., was married in England, June 18, to Miss L. H. McConnel, youngest daughter of the late Wm. McConnel, of Knockdollan, Ayrshire.

C. C. WORSFIELD, heretofore Assistant District Engineer of the Dominion Department of Public Works for Southern British Columbia, has been appointed District Engineer in succession to the late G. A. Keefer.

T. DUFF SMITH, Fuel Agent, Grand Trunk Pacific Ry., Winnipeg, was elected a member of the International Railway Fuel Association's executive committee for three years, at the convention held in Chicago recently.

Miss M. M. Somerville, eldest daughter of F. L. SOMERVILLE, of Toronto, formerly Resident Engineer, Grand Trunk Ry., was married at Winnipeg, June 15, to the Rev. Somerville Caldwell, rector of Rapid City, Man.

E. W. BEATTY, K.C., General Solicitor, C.P.R., on account of whose illness the hearing of the western freight rate case before the Board of Railway Commissioners, June 18, was deferred to Oct. 1, returned to business June 25.

CAPT. KILLALY GAMBLE, who died at Bournemouth, Eng., June 19, was a well known land surveyor of Toronto, being for some time connected with Speight and Van Nostrand. He was President of the Engineers Club of Toronto in 1911.

M. J. BUTLER, C.M.G., formerly Deputy Minister of Railways, and now General Manager, Dominion Steel Corporation, addressed the Canadian Club of Moncton, N.B., recently, on "The Industrial Development of the Maritime Provinces."

D. M. WILLIAMS was presented with some silverware and cut glass by North Bay, Ont., friends, May 31, on leaving the C.P.R. service. In which he was chief clerk in the General Superintendent's office, to engage in business in Montreal.

K. GALLAGHER, Roadmaster, G.T. Pacific Ry., Prince Rupert, B.C., was thrown off a railway motor cycle into the Skeena River, by a collision with a train near Terrace, B.C., recently. The body had not been recovered when this was written.

J. J. HILL, of the Great Northern Ry., U.S.A., who was born at Rockwood, near Guelph, Ont., has contributed $1,000 to the Guelph Y.M.C.A., and $500 towards the cost of beautifying the Everton cemetery, where a number of his relatives are buried.

M. Dow, President, British North American Construction Co., who dropped dead in Prince Rupert, B.C., May 20, had only been there a few weeks in connection with the construction of the G.T. Pacific Ry. docks, for which his company has the contract.

W. D. BARCLAY, General Manager, Canadian Northern Quebec Ry., Quebec and Lake St. John Ry., and Halifax and Southwestern Ry., who has been given leave of absence on account of ill health, left Montreal early in June to spend some weeks at Banff, Alta.

E. H. WILSON, heretofore Assistant Land Commissioner, Alberta Ry. and Irrigation Co., Lethbridge, Alta., has entered private business in partnership, and his firm, Wilson and Skeith, Lethbridge, has been appointed agent for sale of C.P.R. lands and town lots.

SIR THOMAS SHAUGHNESSY, who returned to Montreal, June 9, from Great Britain, denied that he was to be president of a reported large banking merger. He stated that it would probably be many years before he would be able to lay down his work as President of the C.P.R.

JAS. DUGUID, who recently resigned the position of Master Mechanic, G.T.R., Eastern Division, was, on June 1, presented with an address and a purse of gold by his former associates. He has since then been appointed machine shop foreman, Canadian Locomotive Co., Kingston, Ont.

JOS. FARRAR, who was recently appointed Assistant Superintendent, Canadian Locomotive Co., Kingston, Ont., was, for a number of years, in G.T.R. service, subsequently being in the employ of the American Locomotive Co., at Pittsburgh, Pa., and later, with the Chicago and Alton Rd., at Bloomington, Ill.

R. W. BAXTER, heretofore General Superintendent, Illinois Central Rd., at

Chicago, Ill., has been elected President of the Copper River and Northwestern Ry. of Alaska, and of the Alaska Steamship Co., succeeding J. R. Young, who has been made President, Spokane, Portland and Seattle Ry.

J. H. FLOCK, K.C., London, Ont., Honorary Counsel, Canadian Ticket Agents' Association, was the only member of the London city council which welcomed the Duke of Connaught, when, as Prince Arthur, he visited that city in 1860, surviving to welcome him there as Governor-General, May 31.

LORD STRATHCONA has been awarded the Albert Medal of the Royal Society of Arts, with the approval of the President, the Governor General of Canada, for services in improving railway communication, developing resources and promoting commerce and industry in Canada and other parts of the British Empire.

G. J. DESBARATS, Deputy Minister of Naval Service, who is in England in connection with the international wireless conference, will, it is stated, remain there to assist in the conference between the Premier, the Minister of Marine and the Imperial Government, regarding suggestions as to the naval policy to be adopted by Canada.

G. BETHUNE GREY, of the C.P.R. Land Department, London, Eng., died at Woking, Surrey, recently, after a long illness, aged 53, from Bright's disease. He was born in Edinburgh, Scotland., and was, for some time, resident in Alberta, before becoming connected with the C.P.R. Land Department. He joined the London staff about four years ago.

GEORGE B. HULL, A.M. Can. Soc. C.E., Assistant Engineer, Dominion Department of Public Works, who had charge of the surveys for and construction of the Quinze dam of the Upper Ottawa River reservoir system, has been appointed District Engineer for the Department in British Columbia, with headquarters at Prince Rupert.

W. C. LANCASTER, M.Am.I.E.E., who has been appointed Electrical and Mechanical Engineer, Canadian Northern Montreal Tunnel and Terminal Co., is a graduate of Virginia University, and has had experience on tunnel construction on the Pennsylvania crosstown tunnels and various other works in the U.S., and abroad, besides being consulting engineer for several of the large tunnel contractors in New York.

W. M. PUNTER, Manager, Canadian Branch, Saxby and Farmer, Ltd., railway and signal engineers and contractors, with headquarters at Montreal, left there about the middle of May for a trip to the Pacific coast. En route he was attacked with pneumonia, and on arrival at Winnipeg had to be taken to the General Hospital. He had sufficiently recovered to return to Montreal about the middle of June, where he is convalescing.

J. S. PYEATT who has resigned as Vice President and General Superintendent, Fort Worth and Rio Grande Ry., Fort Worth, Texas, on his appointment as Vice President and General Manager, New Orleans, Texas and Mexico Rd., and Beaumont, Sour Lake and Western Ry., and Vice President, St. Louis, Brownville and Mexico Ry., Houston, was for some time Superintendent, Canadian Division, Pere Marquette Rd., St. Thomas, Ont.

HON. F. COCHRANE, Minister of Railways and Canals, left Ottawa June 26, intending to be absent till September. Press reports say he will go over as much of the National Transcontinental Ry. and the G.T. Pacific Ry. as possible between Quebec and Prince Rupert and will also go by steamship from Quebec to Hudson Bay, visiting Nottaway River, Port Nelson and Fort Churchill. Hon. J. D. Reid, Minister of Customs, will act as Minister of Railways and Canals during Mr. Cochrane's absence.

L. G. COLEMAN, who has been appointed Superintendent, Ottawa Division, G.T.R., Ottawa, was born at Macon, Ga., in 1877, and entered railway service in 1900, in the G.T.R. transportation department. He was later transferred to Barrie, Ont., and subsequently returned to Montreal, and in 1906 was appointed Assistant Superintendent, Ottawa Division, and later Assistant Superintendent, Eastern Division, Belleville, Ont., which position he retained to June 24, the date of his present appointment.

F. G. WOOD, who has been appointed Travelling Agent, Canadian Northern Ry., and Duluth, Rainy Lake and Winnipeg Ry., Pittsburgh, Pa., was born at Toronto, Sept. 15, 1890, and entered railway service in 1905, in Division Freight Agent's office, G.T.R., Toronto, since when he has been connected with the National Despatch-Great Eastern Line, Canadian Northern Ry., and G.T. Pacific Ry., at Edmonton, Alta. He returned to C.N.R. service, Feb. 16, 1911, in the Traffic Manager's office, Toronto, and on Apr. 29, 1911, was appointed Contract-

P284 W. A. Fitch,
Assistant Superintendent, Sydney and Oxford District, Intercolonial Ry.

ing Agent, C.N.R., and D.R.L. and W.R., at Pittsburgh, Pa., which position he held to June 1, 1912.

E. L. DESJARDINS, whose appointment as Assistant Superintendent, Montreal and Ste. Flavie District, Intercolonial Ry., was announced in our last issue, was born at St. Jean Port Joli, Que., Aug. 1, 1859, and was educated at Ste. Anne de la Pocaterie College. He entered I.R.C. service, Nov. 1, 1876, since when he has been, to Apr. 11, 1878, agent at Sayabec, Que.: Apr. 11, 1878, to June 1, 1879, night operator at Ste. Flavie, Que.; June 1, 1879, to July 29, 1880, train baggage master between Levis, Que., and Halifax, N.S.; July 29, 1880, to Feb. 15, 1898, dispatcher at Riviere du Loup, Que; Feb. 15, 1898, to May 1, 1912, Chief Dispatcher at Levis, Que.

W. A. FITCH, whose appointment as Assistant Superintendent, Sydney and Oxford District, Intercolonial Ry., Sydney, N.S., was announced in our last issue, and whose portrait appears in this issue, was born at Kentville, N.S., Nov. 25, 1867, and entered I.R.C. service, Oct. 1880, since when he has been, to Jan., 1882, Telegraph operator at Folleigh, N. S.; Jan., 1882, to Apr., 1883, telegraph operator at Maccan, N.S., Sackville, N.B., and St. John, N.B.; Apr., 1883, to July, 1885, agent at Folleigh, N.S.; July, 1885, to Aug. 25, 1886, dispatcher's operator at Truro, N.S.; Aug. 25, 1886, to Mar. 30, 1903, dispatcher at Truro, N.S., Campbellton, N.B., Moncton, N.B., and Truro, N.S.; Mar. 30, 1903, to June 1, 1912, Chief Dispatcher at Sydney, N.S.

W. S. POOLE, Mechanical Superintendent, Prince Edward Island Ry., Charlottetown, P.E.I., who has retired on the Provident Fund, was born at Burslem, Eng., July 20, 1844. He entered railway service in 1857, as an apprentice in Earl Granville's works at Hanley, Eng., and served in other capacities until 1866, when he came to Canada. After spending a short time at other work he entered the service of Schreiber and Burpee, contractors for the construction of the P.E.I. Ry., and on the completion of the line from Charlottetown to Tignish, in 1875, he entered its service as a mechanic, becoming, successively, roundhouse foreman, foreman of erecting shop, locomotive foreman, and, since Aug. 31, 1901, Mechanical Superintendent.

T. COLLINS, who has been appointed Superintendent, District 2, Lake Superior Division, C.P.R., Chapleau, Ont., entered C.P.R. service, Sept. 2, 1885, since when he has been, to Mar. 7, 1887, brakeman, West Toronto, Ont.; Mar. 7, 1887, to Aug. 1, 1896, conductor, West Toronto, Ont.; Aug. 1, 1896, to Sept. 1, 1897, construction trainmaster, Guelph and Goderich branch; Sept. 1, to Oct. 15, 1897, trainmaster, London, Ont.; Oct. 15, 1897, to Jan. 1, 1908, construction trainmaster, double tracking, Montreal to Smiths Falls; Jan. 1. to Apr. 15, 1908, Trainmaster, Smiths Falls, Ont.; Apr. 15, 1908, to June 1, 1909, construction trainmaster, double tracking, Montreal to Smiths Falls; June 1, 1909, to June 1, 1912, Assistant Superintendent, Smith's Falls, Ont.

H. P. DWIGHT, President, Great Northwestern Telegraph Co., was taken ill early in June, first suffering from lumbago and then from weakness of the heart. As this is written on June 26, he is in a critical condition, though hope of his recovery is entertained. He was born at Belleville, N.Y., Dec. 23, 1828, and commenced telegraph operating at an early age. He came to Canada in 1847, from when to 1881 he was in the Montreal Telegraph Co. service, since when he has been in the G.N.W. Telegraph Co.'s service. From 1881 to 1892 he was General Manager; 1892 to 1903, President and General Manager; and from 1903, President. During the North West rebellion of 1885 he rendered signal service to the Government, which was acknowledged in Parliament by the then Minister of Militia. He is also connected with several industrial and financial companies.

MORLEY DONALDSON, M.Can.Soc.C.E., who has been appointed Vice President and General Manager, Grand Trunk Pacific Ry., Winnipeg, and whose portrait appears in this issue, is a son of the late Major R. D. Donaldson, of the 41st regiment, and subsequently staff officer of pensioners, Ottawa. He was born near Edinburgh, Scotland, May 1, 1851, and was educated in France and Canada. After spending some time in E. Gilbert and Co.'s engine works, Montreal, he entered the service of W. and F. Shanly, and was with them during the construction of the Hoosac tunnel in Massachussetts. He entered railway service in 1881, as chief draughtsman, Canada Atlantic Ry., since when he has been consecutively Superintendent of Traffic, Superintendent Mechanical Department, and to Apr. 11, 1898, Superintendent, same road, Ottawa; Apr. 11, 1898, to Sept. 30, 1905, General Superintendent, same road, Ottawa; and on the absorp-

tion of the C.A.R. by the G.T.R., and its operation as the Ottawa division, G.T.R., he was appointed Superintendent, which opsition he retained to June 17, the date of his present appointment.

E. H. KEATING, who died at Toronto, June, 17, was born at Halifax, N.S., Aug. 7, 1844, and was educated at the Free Church Academy and Dalhousie University. He studied engineering under G. Whiteman, Nova Scotia Government Engineer, and Sir Sandford Fleming, and commenced his career on the Pictou Extension Ry. In 1867 he was chief draughtsman, Windsor and Annapolis Ry.; 1867 to 1870, Contractors' Engineer, European and North American Ry., and Division Engineer, Intercolonial Ry. at various points in Nova Scotia and New Brunswick; 1870 to 1871, Division Engineer in charge of exploratory surveys, C.P.R.; 1872 to 1890, City Engineer, Halifax, N.S., during which time he was also engaged in private practice, designing and constructing water works, sewerage works, etc., and also acted as Resident Engineer, Halifax graving dock; 1891 to 1892, City Engineer, Duluth, Minn.; 1892 to 1898, City Engineer, Toronto; 1898 to 1904, General Manager, Toronto Ry.; 1904 to 1905, Manager and Engineer for Mackenzie, Mann and Co. in Mexico, and since then in private practice in Toronto, latterly as senior partner of Keating and Breithaupt. He was appointed a member of the commission to deal with the proposed dry dock at Montreal, in 1903, and was responsible for several large municipal engineering works. He was a member of the Canadian Society of Civil Engineers, since May 23, 1895, and served as President in 1901, as Vice President in 1899 and 1900, and as a member of the council from 1896 to 1898. He was also a member of the Institute of Civil Engineers (Eng.), of which he was elected a member of the council in April, and was a member of the American Society of Civil Engineers.

Algoma Steel Corporation.—Under the Ontario Companies Act, supplementary letters patent have been issued changing the name of the Lake Superior Iron and Steel Co. to that of the Algoma Steel Corporation; increasing the capital from $1,000,000 to $30,000,000, of which $15,000,000 shall be preference stock, and authorizing it to take over the following companies:—Algoma Steel Co., Algoma Commercial Co., Algoma Iron Works, Lake Superior Power Co., Elborn Limestone Co., Cannelton Coal and Coke Co. The two latter companies are located in the U.S., the first in Michigan, and the second in West Virginia. This is a consolidation of a number of the subsidiary companies owned by the Lake Superior Corporation, and is being carried out in furtherance of the policy of consolidating the subsidiary companies in natural groups and arranging for the independent management and financing of each consolidated unit.

The Canadian Locomotive Co., Kingston, Ont., has increased its output from five locomotives a month to eight, and by the end of this year will be able to turn out 15 to 18 a month.

The General Improvement and Contracting Co., Ltd., has been incorporated under the Dominion Companies Act, with $100,000 capital and office at Montreal, to engage in river, lake, canal, and other dredging, and in connection therewith to own and operate vessels, wharves, piers, elevators, etc. The incorporators are E. Rainville, J. O. Gagnon, and others of Montreal.

The steamboat Frontier, operated by the People's Steamboat Co., Toronto, formerly known as the Argyle, and before that as the Empress of India, which is running between Toronto and the Niagara River, started Sunday trips on June 23, carrying about 400 people on the two round trips between Toronto and Lewiston.

Transportation Appointments Throughout Canada.

The information under this head, which is almost entirely gathered from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who may notice any error in our announcements will confer a favor by advising us.

Canadian Northern Ry.—JAS. MORRISON, heretofore chief rate clerk, C.P.R., Montreal, has been appointed Assistant General Passenger Agent, Eastern Division, C.N.R. lines east of Port Arthur in Ontario and Quebec. Office, Montreal. Agents east of Ottawa send correspondence and reports of passenger traffic to Mr. Morrison, instead of as formerly to Guy Tombs.

GUY TOMBS, heretofore General Freight and Passenger Agent, lines east of Ottawa in Ontario and Quebec, has been appointed General Freight Agent, lines east of and including Ottawa. Office, Montreal.

J. H. MCKINNON, heretofore Commercial Agent, St. Paul, Minn., has been appointed General Agent.

F. G. WOOD, heretofore Contracting Freight Agent, Pittsburgh, Pa., has been appointed Travelling Freight Agent,

Morley Donaldson,
Vice President and General Manager, Grand Trunk Pacific Ry.

there, vice A. E. Hodgins, appointed General Agent, as announced in our last issue.

A. J. ISBESTER, heretofore Assistant District Engineer, C.N.O.R., Port Arthur, Ont., has been appointed District Engineer, there, vice H. T. Hazen, resigned, to enter the Railways Department service.

Canadian Northern Steamships, Ltd.—JAS. MORRISON, who has been appointed Assistant General Passenger Agent, Eastern Division, C.N.R., as mentioned above, has also been appointed Assistant General Passenger Agent, Canadian Northern Steamships, Ltd.

J. B. HOSEASON, heretofore in General Freight and Passenger Agent's office, lines east of Ottawa in Ontario and Quebec, has been appointed General Agent, C.N. Steamships. Office, Montreal.

Canadian Pacific Ry.—D. L. JONES, heretofore District Master Mechanic and Trainmaster, District 2, Atlantic Division, Woodstock, N.B., has been appointed District Master Mechanic, Districts 1 and 2. The position of Trainmaster, District 2, has been abolished, and F. Grant, heretofore District Master Mechanic, District 1, Brownville Jct., Me., has resumed the position of locomotive driver. Office, McAdam Jct., N.B.

C. W. STACKHOUSE, heretofore Locomotive Foreman, Three Rivers, Que., has been appointed Locomotive Foreman, Sherbrooke, Que., vice G. Couture, transferred to Three Rivers. Que.

G. COUTURE, heretofore Locomotive Foreman, Sherbrooke, Que., has been appointed Locomotive Foreman, Three Rivers, Que., vice C. W. Stackhouse, transferred to Sherbrooke, Que.

L. G. ROGERS, heretofore Chief Dispatcher, District 1, Eastern Division, Farnham, Que., has been appointed acting Trainmaster, District 1, Eastern Division. Office, Farnham, Que.

J. J. MORGAN, heretofore trick dispatcher, Farnham, Que., has been appointed acting Chief Dispatcher, District 1, Eastern Division, vice L. G. Rogers, promoted. Office, Farnham, Que.

W. WOOD, heretofore Locomotive Foreman, Megantic, Que., has been appointed Locomotive Foreman, Sortin Yard, Montreal. This is a new position.

G. AITKEN, heretofore Assistant Foreman, Glen Yard, Montreal, has been appointed Locomotive Foreman, Megantic, Que., vice W. Wood, promoted.

C. A. DELANEY, heretofore fitter at North Bay, Ont., has been appointed assistant foreman, Glen Yard, Montreal, vice G. Aitken, promoted.

H. B. SPENCER, Superintendent, Ottawa, having returned to duty after absence through ill health, J. H. BOYLE, who has been acting Superintendent, has resumed the position of Assistant Superintendent there.

C. W. LOTT, heretofore Chief Dispatcher, Smiths Falls, Ont., has been appointed acting Assistant Superintendent, District 2, Eastern Division, Smiths Falls, vice T. Collins, promoted.

J. W. WANSBOROUGH, heretofore night chief dispatcher, Toronto, has been appointed Chief Dispatcher, Districts 3 and 4, Toronto.

J. B. CROSSETT, heretofore trick dispatcher, Toronto, has been appointed night chief dispatcher, there, vice J. W. Wansborough, promoted.

G. E. MURPHY has been appointed assistant foreman, West Toronto shops, vice J. H. Mitchell, resigned.

The Lake Superior Division was reorganized on June 1 into three districts, the territory of each, and the superintendents, being as follows:—

District 1 — Timiskaming, Kipawa, Webbwood, Algoma, Sudbury, North Bay and Cartier subdivisions, including all terminals connected therewith, except Cartier and Muskoka. G. SPENCER, Sudbury, Ont.

District 2—Chapleau and White River subdivisions, including Cartier terminal. T. COLLINS, Chapleau, Ont.

District 3—Schreiber and Nipigon subdivisions, including White River terminal. J. H. HUGHES, Schreiber, Ont.

In consequence of the reorganization of the Lake Superior Division the headquarters of the following officials, which were formerly at White River, have been moved to Schreiber:—R. V. NICHOLSON, Bridge and Building Master; W. MASCOE, Car Foreman; R. T. MORAN, Chief Dispatcher; F. NOWELL, District Master Mechanic; J. F. GILDEA, Locomotive Foreman; M. KELLY, Resident Engineer; M. J. SHERIDAN and J. CAUGHLIN, Roadmasters.

H. B. STEVENS, heretofore Chief Dispatcher, White River, Ont., has been transferred to Sudbury, Ont.

D. BURBIDGE has been appointed Car Foreman, White River, Ont., vice J. Baldwin.

A. J. WOLFE, heretofore Roadmaster, White River subdivision, Lake Superior Division, White River, Ont., has been appointed Roadmaster at Chapleau, Ont.

A. STURROCK has been appointed acting Locomotive Foreman, Fort William, Ont., on account of the serious illness of J. McArthur.

N. KEELAND has been appointed Travelling Freight Agent for Eastern Manitoba, vice J. H. Gordon, deceased. Headquarters, Winnipeg.

R. R. NEILD, General Foreman, Winnipeg shops, has resigned.

F. WALKER, heretofore Chief Dispatcher, Vancouver, B.C., has been appointed Car Service Agent, Winnipeg, vice G. B. Williams, resigned.

J. B. SHELTON, heretofore Car Foreman, G.T. Pacific Ry., Transcona, Man., has been appointed Car Foreman, C.P.R., Moose Jaw, Sask., vice C. H. Zerbach, transferred.

C. H. ZERBACH, heretofore Car Foreman, Moose Jaw, Sask., has been appointed car foreman, Estevan, Sask., This is a new position.

J. E. LETHBRIDGE, heretofore Auditor, Alberta Ry. and Irrigation Co., Lethbridge, Alta., has been appointed General Auditor, Department of Natural Resources, C.P.R., acting in a travelling capacity. Headquarters, Lethbridge, Alta.

W. W. NEELAND, heretofore Storekeeper, Alberta Ry. and Irrigation Co., Lethbridge, Alta., has been appointed Storekeeper, Department of Natural Resources, C.P.R. Office, Lethbridge, Alta.

R. SINCLAIR has been appointed Trainmaster between Laggan and Field, including Field terminals, vice A. W. G. Clark, transferred to Manitoba Division. Office, Field, B.C.

W. S. HALL, heretofore Yardmaster, Cranbrook, B.C., has been appointed Trainmaster, Macleod, Alta., vice P. F. Weisbrod, promoted.

D. G. MCDONALD has been appointed Locomotive Foreman, Red, Deer, Alta., vice J. A. Doig assigned to other duties.

J. H. JACKSON, heretofore acting Locomotive Foreman, Rogers Pass, B.C., has been appointed Locomotive Foreman there.

The Shuswap and Okanagan subdivisions, British Columbia Division, heretofore in charge of A. W. GRASS, Roadmaster, have been divided, and he has been appointed Roadmaster from Revelstoke to Sicamous on the Shuswap subdivision, and from Sicamous to Okanagan Landing on the Okanagan subdivision. Office, Revelstoke. W. LOFTUS, heretofore extra gang foreman, has been appointed Roadmaster from Sicamous to Kamloops, including Sicamous yard. Office, Sicamous.

H. A. KESWICK, shop foreman at Kamloops, B.C., has resigned.

J. E. BEATON, heretofore yard foreman, Cranbrook, B.C., has been appointed Yardmaster there, vice W. S. Hall, promoted.

T. MORE, heretofore trick dispatcher, Vancouver, B.C., has been appointed Chief Dispatcher, District 2, British Columbia Division, Vancouver, vice C. A. Cotterell, promoted.

Canadian Pacific Ry., Minneapolis, St. Paul and Sault Ste. Marie Ry., Duluth, South Shore and Atlantic Ry.—R. C. CLAYTON, heretofore Travelling Passenger Agent, Philadelphia, Pa., has been appointed City Passenger Agent, there, vice F. W. Huntington, deceased.

Dominion Atlantic Ry.—G. G. HARE, Engineer, Kingston and Pembroke Ry., Kingston, Ont., is reported to have been transferred to D.A.R. service.

Fort Garry Union Station, Winnipeg.—M. H. MACLEOD, General Manager and Chief Engineer, Canadian Northern Ry.; A. G. MACFARLANE, acting District Engineer, National Transcontinental Ry.; H. H. BREWER, General Superintendent, G.T. Pacific Ry., and J. R. CAMERON, Assistant General Manager, Canadian Northern Ry., Winnipeg, have been appointed members of the Terminals Board, controlling the Winnipeg Joint Terminals of the Canadian Northern, G.T. Pacific and National Transcontinental Rys. Mr. Brewer's appointment is as an acting member.

J. A. GLASFORD, formerly General Yardmaster, C.P.R., Winnipeg, has been appointed Terminals Manager.

G. A. TEMPLEMAN, heretofore Assistant Yardmaster, Canadian Northern Ry., Fort Rouge, Man., has been appointed General Yardmaster, Winnipeg Joint Terminals.

Grand Trunk Pacific Ry.—The practice of designating the several Vice Presidents by numbers has been discontinued.

W. WAINWRIGHT, heretofore First Vice President, has been appointed Vice President. Office, Montreal.

M. M. REYNOLDS, heretofore Second Vice President, has been appointed Vice President, in charge of Financial and Accounting Departments. Office, Montreal.

MORLEY DONALDSON, M. Can. Soc. C.E., heretofore Superintendent, Ottawa Division, G.T.R., Ottawa, has been appointed Vice President and General Manager, lines west of Fort William, Ont., in charge of Construction, Transportation and Maintenance Departments, vice E. J. Chamberlin, recently appointed President. Office, Winnipeg.

J. E. DALRYMPLE, heretofore Fourth Vice President, has been appointed Vice President, in charge of traffic. Office, Montreal.

H. H. HANSARD, Assistant Solicitor, is reported to have been appointed Solicitor, G.T.P.R., Winnipeg, vice D'Arcy Tate, who resigned in April.

The following agents have been appointed:—Cabot, Man., A. Jackson; Gregg, Man., D. W. Peters; Gerald, Sask., R. W. Gibson; Tate, Sask., G. V. Nowlan; Bradwell, Sask., T. W. Fleming; Biggar, Sask., J. O'Leary; Coblenz, Sask., H. E. Henshaw; Camrose, Alta., A. McRae.

Grand Trunk Ry.—J. W. FARRELL, Trainmaster, District 1, Island Pond, Vt., has had his jurisdiction extended to include District 2, and reports from that district hitherto sent to J. J. Connelly, are now sent to him. Office, Island Pond, Vt.

J. J. CONNELLY, heretofore Trainmaster, District 2, Eastern Division, Island Pond, Vt., has been appointed Assistant Superintendent, District 4, and in charge of Montreal terminals, vice H. F. Coyle, transferred. Office, Montreal.

J. W. CANATSY has been appointed General Yardmaster, Montreal Terminals, vice X. J. Schlatze.

L. G. COLEMAN, heretofore Assistant Superintendent, Districts 6 and 7, Eastern Division, Belleville, Ont., has been appointed Superintendent, Ottawa Division, vice M. Donaldson, promoted to G.T. Pacific Ry. service as Vice President and General Manager. Office, Ottawa.

H. F. COYLE, heretofore Assistant Superintendent, District 4 and Montreal Terminals, Montreal, has been appointed Assistant Superintendent, Districts 6 and 7, Eastern Division, vice L. G. Coleman, promoted. Office, Belleville, Ont.

W. KIRKWOOD, heretofore locomotive driver, Sarnia Tunnel, has been appointed Road Foreman of Engines, Stratford, Ont., vice G. Black, deceased.

The following agents have been appointed:—Lacadie, Que., J. A. Langlois; Huntingdon, Que., E. E. Bourdon; Beauharnois, Que., E. Rheaume; Keene, Ont., P. Stinson; Uhtoff, Ont., R. G. Winters; Kirkfield, Ont., G. Raymes; Alliston, Ont., E. M. Ellis; Everett, Ont., E. N. Marshall; Grimsby Beach, Ont., J. A. Mitchell; Winona, Ont., S. A. Fairweather; Hespeler, Ont., N. A. Walford; Owen Sound, Ont., J. G. Heyd; Whitechurch, Ont., R. M. Patten; Ripley, Ont., W. M. Salkeld; Vankleek Hill, Ont., G. A. Cass; Kinburn, Ont., O. B. Elliott, temporarily; Wilno, Ont., G. H. Bates; Brule Lake, Ont., P. F. Madden; Sprucedale, Ont., H. W. Otto; Rose Point, Ont., R. J. Hardy; Galt, Ont., outside, G. T. Misener.

Great Northern Ry.—L. W. HILL, heretofore President, has been appointed Chairman of the Board, vice J. J. Hill, retired.

K. J. BURNS, heretofore General Agent, Vancouver, B.C., has been appointed Assistant General Freight Agent, in direct charge of the company's freight traffic interests in British Columbia west of the 121st meridian, including Vancouver Island. Office, Vancouver.

Hudson Bay Ry.—Referring to the mention made in our last issue of a press report stating that C. J. BRUCE stated to be Chief Engineer of Surveys, had resigned, we are advised that he was an instrument man. As stated in the same paragraph, J. ARMSTRONG is Chief Engineer.

H. T. HAZEN, heretofore District Engineer, Canadian Northern Ontario Ry., Port Arthur, Ont., has received an appointment on the Dominion Government railway to Hudson Bay. It is said that he will be in charge of the railway terminals work in Hudson Bay.

Kingston and Pembroke Ry.—JAS. IRWIN, of Montreal, is reported to have been appointed Engineer, K. and P. Ry., vice G. G. Hare, transferred to Dominion Atlantic Ry. service.

Michigan Central Rd.—R. H. L'HOMMEDIEU, heretofore General Manager, has been appointed Assistant to the Operating Vice President, performing such duties as may be from time to time assigned to him. Office, Detroit, Mich.

W. H. FLYNN, heretofore Division Master Mechanic, St. Thomas, Ont., has been appointed Superintendent of Motive Power, vice E. D. Bronner, appointed General Manager, as announced in our last issue. Office, Detroit, Mich.

T. J. BURNS, heretofore Assistant to Superintendent of Motive Power, Detroit, Mich., has been appointed Assistant Superintendent of Motive Power. Office, Detroit, Mich.

E. R. WEBB, heretofore Division Master Mechanic, Michigan City, Ind., has been appointed Division Master Mechanic, St. Thomas, Ont., vice W. H. Flynn, promoted.

T. HALL, heretofore Division Foreman of Buildings, St. Thomas, Ont., has been appointed Assistant Superintendent of Buildings. Office, Jackson, Mich.

A. LESLIE, heretofore shop foreman, St. Thomas, Ont., has been appointed Division Foreman of Buildings, vice T. Hall, promoted. Office, St. Thomas, Ont.

Niagara Navigation Co.—See under "Richelieu and Ontario Navigation Co.'s absorption of three more steamboat lines" in Marine Department, further on in this issue.

Pere Marquette Rd.—E. E. CAIN, heretofore Superintendent, Cincinnati, Hamilton and Dayton Ry., Dayton, Ohio, has been appointed Superintendent, Toledo-Ludington District, P.M.R., vice A. R. Merrick, transferred. Office, Saginaw, Mich.

GLEN WARNER has been appointed Fuel Inspector, reporting to Assistant General Manager, Detroit, Mich.

Prince Edward Island Ry.—P. MCQUAID, heretofore roundhouse foreman, has been appointed Master Mechanic. Office, Charlottetown, P.E.I.

Reid Newfoundland Co.—A. C. GRAY has been appointed Superintendent of Motive Power, vice W. H. Turnbull, resigned. Office, St. John's, Nfld.

Richelieu and Ontario Navigation Co.—See under R. and O.N. Co.'s absorption of three more steamboat lines in Marine Department, further on in this issue.

St. Lawrence River Steamboat Co., Thousand Island Steamboat Co.—See under "Richelieu and Ontario Navigation Co.'s absorption of three more steamboat lines" in Marine Department, further on in this issue.

Union Station, Regina, for C.P.R. & C.N.R.

The Railway and Marine World for Oct., 1911, contained a preliminary description of the station being built at Regina, Sask., by the C.P.R. for joint use with the Canadian Northern Ry. Following are fuller details:—

The main building is fireproof throughout and the wings are of slow burning construction. The main building is reinforced concrete frame construction, the foundations being also reinforced. The ground floor of the main building is designed to carry a live load of 175 lbs. per square ft., and the first and second floors 75 lbs. per square ft. The wings are designed to carry 200 lbs. live load per square ft. The building has been designed so that an additional story can be added over the main building, if required for offices.

The main portion of the structure is 105 by 64 ft. The east wing is 105 ft. long and the west wing 107 ft. long. The cost of the whole structure, including track work, platforms, fittings, etc., will be about $200,000. The structure is being built of Bedford stone in the renaissance style. A special feature has been made of the deep stone reveals of the door and window openings.

The principal entrance is in the centre of the main building and faces Railway St., a subway is provided under the tracks at the east end of the building on Broad St. The track side has two entrances, one on each side of the ticket office, which is placed centrally in the general waiting room opposite the main entrance.

A steel and glass marquise, suspended on heavy iron chains from lions heads bolted through the wall, runs the entire length of the main building outside the general waiting room on the track side. This marquise has ornamental copper cresting and shields, and projects 12 ft. from face of stonework over the train platform. Similar protection is provided outside the baggage and express department both on the front and track sides, but the supports consist of steel trusses bolted into the walls. A clock chamber is provided over the main entrance with self-illuminating clock dials showing from the front of the building and also in the general waiting room. The vestibule and waiting room staircase and corridors are designed in the French renaissance style.

Entry is made from the main entrance through the vestibule to general waiting room by folding doors. This room, which is one of the features of the building, is 44 by 102 ft., and 19 ft. high. A marble terazza floor with dark marble border is provided around the room and between piers. The walls of the general waiting room are decorated with a panelled oak moulding 10 ft. high, supported on a verdantique marble base. The central piers and wall pilasters are finished in plaster supported on verdantique marble bases. The plaster caps of these piers are enriched with ornamental plaster shields. The piers and pilasters carry the plaster freize, architraves and modillion cornice under the ceiling. The light well, which is between the ticket office and vestibule, is finished in oak to match the interior trim of the general waiting room. The light shaft is carried through the first and second floors and is finished on the corridor side with a brass handrail. This light shaft also serves to ventilate and light the offices on the inside of the building.

The booking office is 9 ft high and the front is octagonal in plan; it is provided with two ticket cages, each 7 x 8 ft., with interlaced wire partitions and appropriate fittings. There are a number of counters, including information and ticket counters, with metal grills over them. Special fittings are provided at the back of counters to suit the requirements of the ticket agent, and a ticket room is provided in the basement for the storage of tickets.

A steel and marble staircase is provided from the general waiting room at the side of the ticket office to give access to the offices on the first and second floors. This staircase leads to the mezzanine floor over the booking office (which is finished as a gallery, with terazza floor and iron railings) with plaster newells supporting ornamental electric light fittings. The staircase, from the gallery to the first and second floors, is provided with wrought iron ornamental shields and oak handrails.

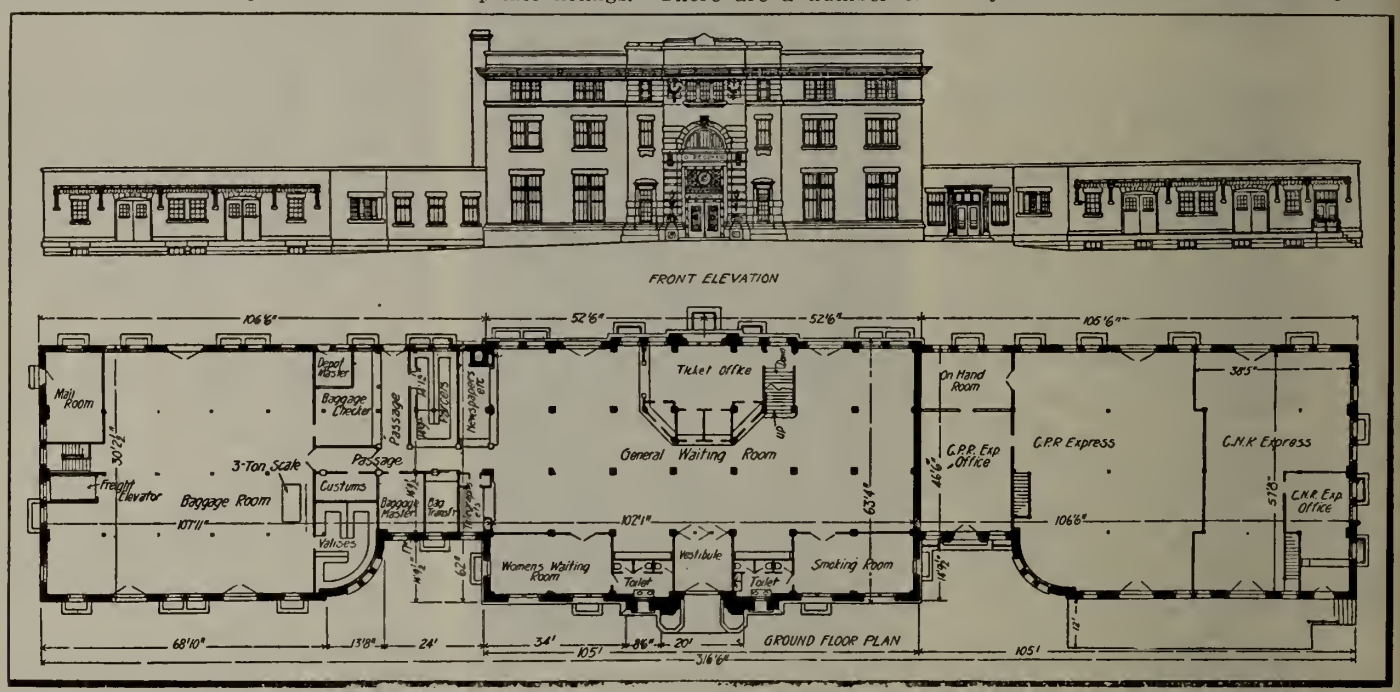
Ornamental plaster shields and enrichments are designed over the entrances of the general waiting room and above the pilasters of the doors and windows. The panelling of the waiting room door and windows, counters, pilasters, etc., is white oak, finished with a dull surface. The space outside the baggage department is finished to match. All the plaster work, with the ornamentation mentioned, is tinted to harmonize with oak finish and marble work, as is also the ceiling, the latter being a light buff.

The smoking and retiring rooms, toilets, news and telegraph offices are easy of access from the general waiting room. A 15 ft. space is provided at the west end in the baggage department to provide access to the counters of the parcels, baggage transfer and checking rooms, and there is a valise room at the rear of these. The baggage master's office is situated at the side of the checking room. An entrance from the platform is provided for the use of passengers. The telegraph department is placed at the west end of the general waiting room, where there are also two private telephone boxes. Opposite the telegraph department is the news agent's office with glass silent salesmen on both sides. Besides the accommodations mentioned above, the west wing has mail transfer and customs offices; the rest of the wing, including the basement, is for the storage of baggage. An electric elevator is provided for handling baggage.

The east wing is occupied by the Dominion Express Co. and the Canadian Northern Express Co. The public entrances to these offices are from Railway St. The offices will be fitted up with quarter sawed oak counter fittings, and cages to suit the companies' requirements. The basement of this wing is used for storage purposes. The boiler room for heating the building is in the basement in the centre of the main building.

The electrical work is done by the C.P.R. electrician, and all the wiring, fittings, etc., will be of the most up-to-date description. Lights are suspended from hanging chain pendants in the general waiting room, and are supported by brackets attached to wall pilasters and fittings in the gallery. Specially designed electric light standards will be provided over stone pedestals at the sides of the principal entrance. These will be finished to harmonize with the metal grillage at entrance. The first and second floors of the main building will be used for offices by the two railway companies, and will be subdivided to suit the requirements.

The building was designed in the C.P.R. Chief Engineer's office in Winnipeg. The work is being carried out under the supervision of the C.P.R. Division Engineer at Moose Jaw, T. Martin, the contractors being the J. McDiarmid Co., Winnipeg.



Elevation and Floor Plan of Union Station, Regina, Sask.

The Distribution of Heat Value in Coal.

By Sydney H. Pudney, Fuel Inspector, Eastern Lines, Canadian Pacific Railway.

The subject of how the heating value in coal is distributed, and why the proportionate distribution of such heating values affect the consumption and economy of fuel is very little understood by large numbers who use coal for the production of steam power. It is also a subject that is often lost sight of by those who construct steam boilers and their settings.

The many bylaws covering the smoke nuisance in various localities cause a need for a closer study into coal and its combustion which will also add to the economical use. The idea of putting in steam sprays at various parts of the combustion chamber or smoke stacks, to overcome the smoke nuisance, is no doubt a costly one, and detrimental in many ways, especially if by careless handling an excess of steam is used. What is needed to assist in the economical use of fuel and at the same time to abate the smoke nuisance is a closer study of fuel matters, following all subjects pertaining to them, such as the percentage of volatile combustible of fixed carbon and of ash. A knowledge of the action of fuels in the process of combustion in a furnace or firebox is essential to everyone who would understand the science of fuel economy. A careful study of the nature of the ash, and its action in forming clinker, or in other ways preventing a free circulation of air through the fuel bed, is also very beneficial in the use of fuel. An elementary analysis is of the utmost value in determining the heating power of a fuel, much more so than the "proximate analysis" that is so freely used, just because it gives one the exact percentage of combustible elements and non-combustible elements which a coal contains. The usual calorimetric test of fuel is a good reliable means of ascertaining the highest power of a coal which is burned in oxygen and is usually expressed in b.t.u.

When one gets all the above information, with the b.t.u. value in each case from standard calculations, his knowledge of fuel is yet very little assistance to him in pursuing a system of economy of fuel, or lessening the smoke trouble, in anything like a scientific or business like manner. And if he goes into it only armed with such knowledge the results of his efforts are likely to fall far below his expectations. The important knowledge which he must have is that of the combustion of fuel, a subject which is nearly worn threadbare.

It is to be presumed that most men in an official capacity already know that hydrogen combines with oxygen in combustion and forms water as a product of combustion, giving up 62,000 b.t.u. in so doing, and also that carbon will unite with one part of oxygen, forming monoxide of 4,500 b.t.u. value, or will combine with two parts of oxygen, forming carbon dioxide of 14,544 b.t.u. value, therefore it would appear that as far as they are concerned the combustion of fuel is old.

There are points in connection with the burning of fuel that the practical man never learns because of his lack of scientific knowledge; and the scientific man never knows because of his lack of practice. The whole of this subject takes years of study and observation to master, and even then there are new ideas coming up continually leading one into different channels of thought. What I want to do in this paper is to give a few examples of different coals and their actions, and the distribution of their heating value.

We will take up the case of volatile combustible matter first. It is usually considered by firemen and engineers, both of stationary engines and locomotives, that a coal that has plenty of flame and smoke is a good one to produce steam, and a great many people are influenced in the purchasing of such coals as have a high percentage of v.c.m. Nothing is farther from the truth than such ideas of enginemen. As a matter of fact the higher the percentage of v.c.m. the lower the heating value of the coal. The reason will be explained later on. I may mention here that as described in the U.S. Geological Survey Bulletin, 373, Messrs. Randall and Weeks made investigation of between 400 and 500 steam boiler plants, and in their summary state that they found that high volatile matter in coal gives low efficiency and vice versa. It is only reasonable to suppose they mean high volatile combustible matter, because all steam users know that a coal which might have 10% of moisture would mean that 10% of its volatile matter was of no use in raising steam in a boiler, and that this moisture would take up heat to vaporize it and drive it off at chimney or smoke box temperature, therefore it is most likely they mean v.c.m. and not v.m.

In an analysis we usually get the percentage of moisture of v.c.m. of fixed carbon, and of ash, with b.t.u. value. In arriving at these percentages a given weight of coal is dried at about 220° F. for an hour and weighed, the loss being the percentage of moisture. The sample is then heated at high temperature by a Bunsen burner for a few minutes and then at a higher temperature by a blast lamp for about the same length of time, and after cooling in a desiccator is weighed, the loss being v.c.m. or volatile combustible matter. This is where I take exception to the rule, because this does not give the v.c.m., but the total v.c.m. and non-combustible elements such as oxygen and nitrogen as well, therefore we find that the proximate analysis is incorrect and the exact percentage of v.c.m. is not given but the total v.m. minus water or moisture. We can easily see how this would mislead us in the purchase of coal. We might buy a coal with 40% v.c.m. shown and it might have 15% of oxygen, consequently only 25% out of this 40% v.c.m. as shown would be of any use to produce steam. Again we might purchase another fuel with 35% of v.c.m. shown, with only 5% of oxygen, and in this case, though the total percentage of v.c.m. dropped 5%, the fuel value increased 5%.

Prof. Phillips, in his work on the analysis and valuation of fuel says the more organic oxygen that is present in a fuel the less heat will be given out, owing to its already being in chemical combination with the carbon and hydrogen.

In the U.S. geological survey bulletin 382, "The effect of oxygen in coal," by David White, it is stated that the result of oxygen in coal, in relation to the heating value, is just about as detrimental as the same percentage of ash would be, that is to say that a coal having 7% of ash and 13% oxygen would give about the same heating value as if the figures were reversed, i.e., 13% ash and 7% oxygen. Two special cases are cited to prove their contention, and in table 1 of the ultimate analysis of 319 American coals there are two cases shown where the ash and oxygen about equal each other in qualities that are detrimental to the heating value. No. 1, having 4.02% o. and 18.80% ash, has 12,472 b.t.u.. no. 2, having 18.32% o. and 3.63% ash, has 12,5519 b.t.u. These cases show conclusively that a proximate analysis as previously mentioned does not give one much reliable information of his fuel.

The calorimetric determination of the heat value of fuel is obtained by its combustion in an enclosed bomb, under a measured quantity of water, and careful readings are taken of the raise in temperature. This, multiplied by the weight of water, gives the b.t.u. value, but this is all it does give, just the heat value only; and to be able to go forward with the subject of fuel economy and smoke prevention in steam boilers it is necessary to know not only the heating value of a coal, but also how such heat value is distributed in the coal and then to devise some means whereby the ultimate value produced by its combustion may be as near as possible to the initial value in the fuel. We shall then be as near to the economy of fuel as it will be possible to be in the combustion of it.

To get at the distribution of heat values it is not necessary to have an elementary analysis, the proximate will enable us to get this information, provided we also have a b.t.u. value from calorimetric test. Take for instance a coal of 35% v.c.m., 55% of f.c., 10% ash moisture, the b.t.u. value from calorimetric test shows it to be 13,700 b.t.u. which is distributed between the 55% f.c. and 35% v.c.m. As the value of carbon is always the same, namely, 14,500 b.t.u. per lb., we find that by multiplying 14,544 by 55% and dividing by 100 we get 7,999 b.t.u. in the fixed carbon, and this subtracted from 13,700 gives us 5,701 b.t..u in the 35% of v.c.m., this volatile combustible matter is only of 16,300 b.t.u. value per lb.

We will take two samples of coal mentioned in the U.S. Geological Survey Bulletin 402 on the utilization of fuel in locomotive practice, by W. F. M. Goss. Coal A has 31.94% v.c.m., 57.71% f.c., 14,047 b.t.u.; coal B has 15.23% v.c.m., 72.75% f.c., 14,347 b.t.u. Coal A from the above calculation has 14,544 x 57.71% f.c. ÷ 100 = 8,393 b.t.u. in fixed carbon and 5,654 in 31.94% of v.c.m. 5,654 x 100 ÷ 31.94% of v.c.m. gives 17,776 b.t.u. value per pound of v.c.m. Coal B, worked out on the same system, is as follows:—14,544 x 72.75% f.c. ÷ 100 = 10,580 bt.u. for fixed carbon and 3,767 b.t.u. for 15.25% v.c.m. Again we find the heating value of the v.c.m 3,767 b.t.u. x 100 ÷ 155.25% = 24,000 b.t.u. per pound.

These few examples are enough to show that the higher percentage of volatile combustible matter the lower the heating value of the coal, as the percentage of v.c.m. increases, the actual value of the heating equivalent decreases, and as the percentage of v.c.m. decreases the heating value increases. Not only this but the total heat value increases. Coal A has a total of 89.65% combustible 14,047 b.t.u. Coal B has a total of 87.98% combustible 14,347 b.t.u. We can easily see why the statement is made in U.S. Geological Survey Bulletin 373 that high v.c.m. gives low efficiency because the power is not there.

So far these points have brought out something definite in the distribution of heating values in fuels, but not enough to economize in fuel. As to the production of smoke we already know that the less percentage of v.c.m. the less smoke, until we may use anthracite with no smoke. But in the case of low efficiency and smoking plants and locomotives, due to high v.c.m. coals or long flame coals there are some very important facts to be considered. In all cases of smoke there is only one thing that can be said to be the reason, and that is incomplete combustion. Complete combustion produces carbonic oxide and water, and both are without color, so when volumes of smoke are

going out into the atmosphere it means loss of such fuel that makes the smoke.

There are several reasons for the incomplete combustion of the gaseous portion of coal, and it is due sometimes to th eclass of coal being used in a certain form of furnace. There is also a great difference, not only in the heat value of the v.c.m., but also how it is contained in the coal and how it will be evaporated or distilled from the fixed carbon in the furnace or firebox. We may take two coals having exactly the same percentage of composition, i.e., 35% v.c.m. and 55% f.c., and yet these two may be totally distinct from each other in the way they will act while going through the process of combustion, and it would be practically impossible to get the same ultimate results from both coals with the same furnace or locomotive. One will give up its volatile matter quickly while the other gives it up very slowly, usually making a dense coke, while the first kind makes no coke practically, and burns away quickly, having no body. The knowledge of the analysis or of their heat distributions does not give any intimation of their actions in the fire, and these are some of the most important things in connection with fuel combustion.

It is doubtful if any one furnace or firebox could be constructed that would give equally good results with both such fuel mentioned, without it were equipped with automatic appliances to regulate the flow of air through the fuel bed and to the combustion chamber. The free burning coal that gives off its gaseous content quickly must have a very large supply of air just at the time of the distillation, or setting free of these gases, and must have this air delivered in such a position that it will become well heated and mixed with the gases before they come near the heating surfaces of the boiler. If such a coal is used without the necessary amount of air delivered in this way, there will be large quantities of smoke and a great loss of heat value due to incomplete combustion of the v.c.m. And as far as the consumer is concerned he might have purchased his coal without an analysis on b.t.u. value except that he will have some idea as to the heat value he is losing through poor equipment.

In the case of stationary boilers that are built in brickwork it is very easy so to construct the bridge wall that there may be a supply of air distribution from it, which will be well heated and mix with the gases as they go over to the combustion chamber. If this is done it will ensure a full supply of air and perfect combustion of the gases of such free burning coal, which will mean less smoke and greater efficiency. To ensure a much greater efficiency it will be necessary to increase the travel of the hot gases over the heating surfaces. The arrangement sometimes used to assist in the combustion of quick burning coal by having holes direct from the atmosphere to a position above the fire is open to dispute, because the cold air rushing in amongst the gases being liberated does not have a chance to become heated and therefore has a cooling effect, lowering the temperature of the firebox. Such inlets are often detrimental to fuel economy. If the holes or inlets are in such a position that the air may be heated, by directing the air downwards to the fire, more benefit will be derived from them.

Poor firing is also a great drawback to good efficiency, with long flame, quick burning coal. If the fireman charges his fire by putting in large quantities at long intervals he will certainly lose a large percentage of the heating value, because it will be impossible to get sufficient air through the fuel bed to mix with the gases at the moment of their being set free from the coal.

In any plant where it is impossible to get the air arrangement in this way it is far more economical to use a slower burning coal, firing on to the dead plate and allowing the gasses to pass over the hot fuel bed while mixing with air and so ensure perfect combustion and less smoke. The only way to fire a free burning coal as described is to carry as light a body as possible, always taking care that there are no bare spots on the grates, and firing often with light charges at each time. As a rule the stationary boiler fireman is not so careful to keep his fire in condition. I remember once going to a boiler house where slack coal was being used, and asking the superintendent how they were progressing. He took me around a battery of four locomotive type boilers, and after opening the door I pointed out to him that there was a bare part of grate at each corner just inside the door fully two square feet at each corner. He promptly drew the fireman's attention to it, and told him to keep the grates covered. We found all four boilers in the same condition. I have repeatedly seen the same with all classes of hand fired stationary boilers, i.e., bare spots on the grates. If a locomotive fireman were to do this it would result in lost time for steam and leaky boiler.

The percentage of heat value in the fixed carbon can be controlled in a better manner than the gaseous content. Every effort should be made to have the coke burn to as near white heat as possible. This is a sure sign that enough air is coming in contact with it. In quick burning coal it is just as necessary to carry a very light body of coke to get the full heat value out of it as it is to carry a light fire for the perfect combustion of the gases. The coke is not solid and will combine very freely with the oxygen of the air. This is evidenced by its quick burning properties. The gases in leaving it make it very porous, so that the air can circulate through it as though it were a sponge, and if there is not sufficient air to form the CO_2 gas, CO will be formed and with only one-third of the heat production it should give.

Often quick burning coals give poor efficiency due to a lack of knowledge of their actions and properties because it is a very easy matter in both locomotive and stationary practice to lose a great deal of the initial heating value. If such coals are fired heavily, that is to say a large application at each time of firing, and the body of the fire is carried too heavy, there will be poor results and low efficiency. In the first place a large percentage of the gaseous content will escape with the chimney gases and smoke stack gases, without ever passing through the process of combustion, therefore a great loss occurs. The same thing occurs with the fixed carbon, owing to its burning so free, which, in other words, means combining with oxygen so freely. If a thick fuel bed is carried it will result in low efficiency due to the oxygen of the atmosphere combining with the lower portion of the fuel bed and forming CO_2, and in passing through the thick bed of fuel is again reduced to CO, consequently producing only 4,500 b.t.u. instead of 14,544 as it would have done if the fuel bed had been thinner.

Besides this there is another feature to be considered with this class of coal and that is its tendency to form clinkers if fired too heavily, sometimes so much so that a stop has to be made to clean the fire, whereas if fired lightly this never occurs, except slightly, causing no damage.

The subject of buying coal on a b.t.u. basis is of no use if no attempt is made to get the ultimate value as near as possible to the initial value as purchased, thereby getting the highest efficiency.

The Passenger Department of a Railway.

By W. P. Hinton, General Passenger Agent, Grand Trunk Pacific Railway.

In the beginning of rail transportation the lines were few, serving a limited territory where there was no competition and each passenger received a receipt, made out on a form duly provided and signed by the agent as his passage ticket. No general passenger agent was necessary then, but with the extension of these lines, connecting with others, forming through links in vast distances, and eventually transcontinental, a special organization was found necessary to provide means for through ticketing and making other arrangements necessary to the convenience and care of the traveller and his property and the protection of the railway and its passenger revenue. The paralleling of the lines and the growing competition eventually required enterprising specialists to arrange to secure and hold as much of the competitive business as possible to their respective lines, and to branch out into new fields and create new business wherever practicable. Thus we have tourist, colonization, transcontinental and round the world traffic promoted in volume, where, if left to itself, the business would not develop except on natural lines and very slowly. The passenger department, in short, while looking closely after the development of business along the line, must instill the desire for travel in the minds of the public and incite them to journey, even to the extent of their resources.

To maintain and supervise the different branches of good service (and there is a constant demand for improved service on the part of the public, and growing competition) there are many subdivisions of the general passenger department, such as the district passenger agents or general agents passenger department, who direct the work of ticket or passenger agents; travelling passenger agents, and on some lines certain of the train employes. They are held accountable for the business in their respective districts, and to promote local excursions, to conduct advertising of a local nature and to examine and report on the condition of cars, their ventilation and heating, the condition of stations and offices as far as they serve the travelling public, and suggest improvements and other changes which will be beneficial to passenger traffic. There are superintendents of dining, sleeping and parlor car service, general passenger agents, tourist and colonization agents and general advertising agents, all expected to be exceedingly thorough and alive to possibilities and who serve to focus results, reports and practical improvements which may be feasible, on the general head of the department for disposition or action.

The organization of a general passenger department may be comparatively simple, as it is on a small line, or very complex, but nevertheless firmly welded together and carefully shepherded, on a large line. The department proper may be divided into the following branches:—1. Tariffs, tickets, excursions. 2. Statistics and accounts. 3. Train schedules and equipment. 4. Advertising. 5. Tourist, immigration and colonization. 6. Baggage. 7. Dining, sleeping and parlor cars.

A brief summary of these varied branches of our work will naturally follow as pertaining to the systematic arrangement and the efficiency of our duties towards the traveller, who must be constantly studied in relation to his needs and desires, which are more or less flitting; so that the unit as well as the volume may be made to move without friction or complaint, while returning the maximum revenue to the transportation company with its enormous investment, for which a capacity business is always desirable.

It may appear to be a simple matter to compile and publish a tariff, and so it would be if a line served purely local

territory, but with many intersections by competing lines, making it advisable to adopt common fares at many points, which have their effect on the majority of fares over the entire system, also owing to the extension of through ticketing arrangements between all railway points on this continent, the problem is far from simple, the work heavy and wearisome, though interesting. One tariff alone may contain 10,000 fares, and any large system has literally scores of such tariffs prepared with utmost care, scrutiny and comparison. Tickets are of many classes, and reading over as many routes, rail, inland waters and ocean, as tariffs may provide for.

Excursions must be duly arranged for, as well as the several classes of traffic for which special tariffs and tickets are provided. As special train movements must be provided for in case of excursions, the closest attention is necessary to the correctness of advices to the different departments involved, with close supervision as to the carrying out of the arrangements, as any neglect of the smallest detail is almost sure to cause inconvenience and serious consequences.

Statistics must be kept of results of train operation, including the different departments, recording revenue or expenditure, which must be scrutinized perpetually to arrest any waste or to watch developments with a view to increased revenue. In like manner the handling of department accounts affords an opportunity for careful study of the expenditure.

Advertising, in which should be included the right kind of publicity, has become one of the most important branches of passenger department work. Not only must copy be supplied for advertising space contracted for in the daily and weekly newspapers and periodicals throughout the land, but news items and stories, keeping the name of the transportation company prominent and impressively before the public, must be prepared and insertion obtained. Through this latter medium it is possible to reach a score of millions of readers or more in the course of a few months. This also creates a better understanding of the railway aims by the public, who, as a rule, never come personally in contact with the higher officials of a railway, and their impressions are more readily formed from the more or less impersonal treatment they receive while travelling with hundreds of others and imbibing adverse criticism or theories by the way.

Display posters and bills are prepared and issued, together with tons of carefully prepared and arranged public time tables. Literature attractively prepared, tastefully printed, and profusely illustrated, must be supplied the soliciting staff for distribution and to drive home the statement that this particular route is the only popular one, or that the prospect needs a change of scene. All are familiar, however, with the nature and variety of these publications.

Tourist traffic is the business that the transportation companies must create, and it really requires more careful and patient tending than any other branch of passenger traffic. There would be little tourist traffic if it were left to develop by itself. The seeds of a desire for travel or change must be sown by the passenger department, and this is the impulse of tourist travel. There is a satisfaction, however, in knowing that once interested this business increases rapidly in volume to each particular section, it becomes a very valuable addition to the local traffic, and in many cases warrants an improvement in train service, from which a large community of regular travellers benefit, and which could not be provided without the through tourist.

Off to the west the mountains rear their snow and ice capped pinnacles, a very ocean of them, and for a long time were considered a never ending detriment to the development of the country. If a cash value were placed on scenery they would be very rich, but then capitalization from a national standpoint is established alone by the efficient work of the passenger department.

Nor are the millions spent in the mountain and other resorts of Canada the only national benefit received. The tourist from other lands becomes interested in Canadian institutions and investments and where he comes to play and rest he is easily induced to own and develop property and aid through his investments the development of Canadian manufactures and prosperity.

An illustration of the benefit to a community the railway activity produces in promoting tourist travel might be instanced to advantage in the business in one of the eastern states during the summer season. Maine is a prohibition state, but tourists leave there annually in the hotels and farmers' hands over $15,000,000. The railways glean besides a reasonable return for their efforts, while producing a satisfactory result to the tourist or health seeker and the local community. Corresponding results might be quoted in the development of travel to Florida and California

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in the winter, the Pacific Coast and mountain resorts at other seasons, and surely the railways have been largely misunderstood by the people whose best interests are at stake, while through legislative action and otherwise, every influence has been employed to curb and restrict their operations. Happily this attitude is passing, or is being directed more and more in other directions in favor of the square deal. Possibly the public will realize, as every student of transportation economics does, that unless this, the greatest business in the world, is made the business partner of the people, neither can prosper or develop.

Immigration and colonization are closely allied, and this branch also calls for specialized work in order to be effective. It is a very important work in its relation to the freight and other industrial traffic revenue of the line. In this work a place must be found where each settler will fit, so that a very wide knowledge of the country and its needs must be acquired, as it is necessary to talk intimately of conditions in sections of the country one, two or three thousand miles apart. Happily, in Canada, we have many talking points, as it is mostly good, and often I have said to a prospective agriculturist, which class is our chief concern, copying an old Chinese proverb: "If the farmer be diligent the soil will not be lazy."

Baggage and its care has received its share of study and attention in the last few years, and it is truly amazing to what perfection its transport has attained. Losses are very seldom experienced in the millions of pieces handled in the year, a result aimed at in the feeling that no matter how pleasant a journey, or what courtesies are received on the train, if baggage is not promptly produced at destination, the testimonial which the traveller has determined to insert in the newspapers on arrival is converted into a withering and sarcastic commentary of the rottenness prevailing on that particular line, and to the passenger official the missing article looks more precious and as difficult to redeem as the one mourned by the shepherd of the other ninety and nine.

Train schedules and equipment is a matter of almost daily study in the general passenger department. In the first place, the needs of the travelling public must be fairly provided for, while the trains operated must be confined to the number which will just suffice and leave terminals and important points at the most suitable hour, at the same time assuring ourselves that the revenue will be remunerative to the company. The public presents many problems in this connection, as varied almost as the number of would be travellers, and while numerous suggestions are furnished to meet peculiar personal needs, a decision must be reached which will please the majority, and the results are disastrous and expensive to the company if any mistake is made in the arrangement of these schedules. Further, when a new train is decided upon to take care of a particular traffic, while supplementing other trains, it should not impair their revenue to any extent. If poor judgment is shown, the expense is great, and it may be many months before a conclusion can be reached as to whether the train should or should not be continued.

In the meantime, expensive equipment is employed; for instance, the cost of equipment used on all railways last year exceeded $1 for each passenger carried; and as a train piles up mileage very fast, whether fully or only lightly patronized, the large expense involved is a fixture which must be grimly viewed. A particular knowledge of the physical features and conditions of the line, also the fitness of motive power for the service required, must be reckoned in dealing with the season's train service arrangements, and suitable equipment for all requirements must be figured on with much care, and requisitioned a year or more ahead, or at the critical time it will not be available. Naturally, it is far from desirable to have more equipment than required of an unsuitable class, an expense and deterioration which must be rigidly guarded against.

When, with other duties in the provision for and care of the travelling public, a passenger department must provide hotels and restaurants on wheels, and give service, too, in these cramped quarters equal to high class hotels, another specialty is introduced into the work which requires little comment on my part as to its difficulties, cares and triumphs, so that this is the only mention I will make of the sleeping, parlor and dining car service, where courtesy of employes, when cheerfully and helpfully given, shines like a precious gem and makes a traveller happy that his choice led him in such pleasant ways.

Passenger work must be different in different sections of the country. For instance, different methods must be employed in Canada, and especially in Western Canada, from, say, New England. In Massachusetts the population is 419 to the square mile, in Manitoba, the most densely populated province of

Western Canada, 6; in Alberta, 1½, and British Columbia, 1. It is apparent that the railway passenger revenue must be drawn to a considerable extent in Western Canada from the through passenger and new settler, whereas in Massachusetts the local traffic alone is very large. In the latter case the business originates at home and needs to be properly taken care of only, while in Canada we must go far afield, even across the seas, to secure sufficient business to cover the expense of operation of our trains, and the handsomely equipped services, the equal of any in America, which are provided for the public here, are only possible through procuring the greater part of our business from remote districts and countries.

In this connection, and as further illustrating the need of effective colonization work and attracting through business, Lieutenant Butler (later General Sir Wm. Butler), in his record of a journey in 1869-70, between Winnipeg and the Rockies, over the trail which the G.T.P. so closely skirts, in recording his thoughts in camp near Portage la Prairie, says:—"Between this little camp fire and the giant mountains to which my steps were turned, there stood in that long 1,200 miles but six houses. On the same day as I read this I saw a train of eight coaches leave the station at Winnipeg with its human freight for points along the self same trail, and this is a matter of daily occurrence on three railways now."

Needless to say, the passenger department must obtain the fullest co-operation of the transportation and mechanical departments, or it can only succeed to a certain degree in developing traffic. In train schedules and ensuring the on time habit for trains, the cleanliness and upkeep of cars and stations, the proper attitude of employes to the travelling public, all mean service and good returns as contrasted with slovenliness and failure without this active co-operation. In my observations, during many years in railway service, I am convinced that next to inefficiency of the traffic department itself, this lack of co-operation on the part of the transportation department is the most frequent cause of failure for that particular line to stand out prominently above other lines designated as railways, but with no particular features to commend them. This is, of course, deplorable and bears very seriously on the possible revenue of such a company.

Do you realize that failures on the part of any department of the railway to please the exacting traveller invariably lead to the injury of the passenger department in the results which it strives to obtain? A complaint for any cause drifts into the general passenger department, which must endeavor to perpetually smooth over the faults of others as well as its own, and its contact with the public is not always pleasant, however necessary. As a matter of fact, we frequently deplore that we do not receive enough complaints.

We do not render thanks for praise, but we invariably do to anyone who will offer us intelligent comment, criticism or complaint respecting our service, fully realizing the value of it and enabling us to remedy some defect, possibly so slight that it was not apparent to us. My experience has convinced me that good service is always cheaper in every way than only fair or poor service. Good service makes friends who are willing to tell their friends about it, the most valuable advertising results we can procure, and at the least cost; new friends are made in an endless chain. Poor service has the effect of making the once patron look around for another route, and he will not be slow in telling others of his preference.

The results achieved by the passenger department do not all directly contribute to the passenger revenue of a railway. No one has been able to accurately estimate the great benefit to the freight revenue from the large expenditure in advertising and publicity disbursed and charged to the passenger department revenue, nor has any claim been made by the railways on the government for the peopling of the lands with tax payers, the greatest of all national undertakings, for which the passenger department of a railway is responsible.

Under the Railway Act of Canada, transportation companies are permitted to give special fares and concessions to land settlers, agricultural exhibition managers, exhibitors and commercial travellers. The ultimate results are reaped by the freight department, owing to the settlement of the land, the improvement of crops and the additional sale and distribution of merchandise and supplies.

Effective advertising and good passenger service to the public has influenced the shipper and merchant to forward his merchandise by the same route as he travels. He finds that the route affording comfortable travelling conditions through smooth track and careful train handling does not damage his freight and leaves it in good saleable condition on delivery, as contrasted with the other line, which makes an expense in repairing damage to his goods, besides detracting from their appearance, freshness and other marketable qualities.

Frequent comparison of the two great branches of the traffic is made, and I am often asked if there is not a great similarity in the work of the freight and passenger departments of a railway. Speaking from an experience of twenty-five years, slightly more than half of which was spent in the freight department, possibly some remarks in this connection will be interesting. The freight department may be fairly compared to the wholesale mercantile warehouse, while the passenger department is the department store. The freight department is a seller of the wholesale merchandise branch of transportation, the passenger of the retail, and with this difference the similarity fairly ends. The freight department has the problem of developing and securing traffic which does not move of itself, and where certain fixed principles apply, the results being certain and quick, and in money revenue to the railway usually much greater in bulk than the passenger receipts.

The passenger department, on the other hand, has a new problem to consider in every community, in fact, frequently finds one in every passenger carried, whose prejudices and convenience, no matter how varied and generally fickle, must be carefully taken into consideration at every turn. A passenger has a mind and legs, freight has neither. A new train may be put on to develop and increase travel, but it takes at least six months or longer to demonstrate whether it is a success or otherwise. It may not suit the communities served just right, but a passenger department must take the responsibility for its enterprise and will be judged accordingly, both by the public and the executive heads of the line. Freight business can be handled by the service necessary from day to day. Passenger service must be maintained regularly under all circumstances, whether there be business or not. In fact, there are so many differences in the principles of conducting these respective departments, and so very few of a similar nature, that I am convinced that there is not a more striking likeness between these brothers than there is say, between the passenger and any other department of railway operation. In other words, they are both concerned in selling transportation, but the nature of their goods is so different that the similarity must cease with that general basis.

You have all heard, however, that the freight business is the backbone of a railway's revenue. Let us look into this. The revenue per train mile of all Canadian railways last year yielded for passenger $1.35, and $2.38 per mile for freight. The earnings of all trains were $2.10 per train mile, and the cost of operation $1.46. It is unfortunate that it is impracticable to separate the absolute cost of operation of freight and passenger trains. The passenger train mileage was 37,000,000, freight 52,500,000. The value of passenger rolling stock used was $36,000,000, of freight, $95,000,000, or, roughly speaking, about one-fourth passenger, three-quarters freight. The cost of maintenance and renewals of cars amounted to 9½c per passenger, and 16½c for freight per train mile. It cost $250,000 more to pay loss and damage claims for freight than the entire expenditure in advertising conducted by all Canadian lines.

Considering the roomy and expensive terminals necessary for receiving and delivering freight; the long crossing and other sidings necessary at each station, chiefly for freight purposes, also their upkeep; the large staff necessary in all principal terminal and transfer offices to handle freight business, as contrasted with the two or three ticket sellers at the same points; the large number of yard engines and crews for freight service, as contrasted with one or two for passenger service in even the largest yards; the larger use of the railway and greater liability to interruption of traffic with slowly moving as contrasted with express trains; additional crews and fuel necessary to move trains an equal distance to passenger trains and other minor considerations, and it will be readily seen that the earnings per mile of passenger and freight trains respectively are not at all out of proportion to the net results.

I hope, as the result of these few remarks, thorough co-operation with the work of the passenger department will be given, and its fitness allowed for a worthy place in each and every railway family in this great country. Lack of co-operation between departments, or the failure of any unit in the railway organization, is a disaster to the company we serve and a crime towards the country in which we live.

The foregoing paper was read before the Western Canada Railway Club recently.

Railway Conquests of the World.—F. A. Talbot, who wrote a recently published volume, "The Working of a Great Canadian Railway," has written another one, "Railway Conquests of the World." The latter deals with the romance of railway building, and when it is considered that there are now 700,000 miles of railways in the world, the author had ample material to work upon. Some of the difficulties of the early periods of railway building in the British Isles, the continent of Europe, and in the United States, are graphically told, and there are given such feats as the boring of the Gothard tunnel in Switzerland, the holy railway to Mecca, the highest line in the world, the Cape to Cairo Ry., the building of railways through the Rocky Mountains, the toy railways of Wales and Central Africa. In fact, Mr. Talbot has gathered together in one volume the most important features in the construction of railways in every part of the world, and tells of them in a most interesting manner. The volume is one of the Conquests of Science Series, issued by W. Heinemann, 21 Bedford st., London, Eng., and sold in Canada through the Methodist Book and Publishing House, at $1.50.

The Canadian Fish and Cold Storage Co., Prince Rupert, has awarded contracts for the construction of three steam trawlers in Selby, Eng., at an approximate cost of $40,000 each. The dimensions will be, length, between perpendiculars, 118 ft., beam 22 ft., depth of hold 12½ ft. Each vessel will be equipped with triple expansion engines, supplied with steam by Scotch boilers, and they will have a speed of about 10 knots. They are being built to special specification and in excess of classification requirements, 100 A1 at Lloyds. Two of them are to sail from England in Sept., and the third, with the possible addition of a fourth one, in October.

Orders by Board of Railway Commissioners.

Beginning with June, 1904, we have published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed our paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates given of orders, immediately following the numbers are those on which the hearings took place, and not those on which the orders were issued. In many cases orders are not issued for a considerable time after the dates assigned to them.

16548. May 20.—Authorizing C.P.R. to rebuild bridge 94.8, Moose Jaw subdivision, Sask., and rescinding order 15687, Dec. 27, 1911, giving similar authority.

16549, 16550. May 20.—Recommending to the Governor-in-council agreements between Canadian Northern Ry. and Midland Ry. of Manitoba (G.N.R.) for operation as joint section from International boundary to Woodward Ave., Winnipeg, and authorizing such operation for 30 days, when, if not approved by Governor-in-council, operation shall cease.

16551. May 20.—Approving location of Central Ry. of Canada from C.P.R. near McAlpine station, mileage 7.2, to G.T.R. near South Indian station, mileage 38.165, Russell county, Ont.

16552. May 21.—Authorizing J. Battle, Thorold, Ont., to build chute under G.T.R. Stuart St. station yard, Hamilton.

16553. May 20.—Ordering G.T.R. by Aug. 1 to install electric bell at crossing of con. 3, Stamford tp., Ont., 20% to be paid from the railway grade crossing fund.

16554. May 20.—Approving Kettle Valley Ry. location from mileage 4.80 to 38.99, west of Penticton, B.C.

16555. May 20.—Authorizing Vancouver and Lulu Island Ry. (C.P.R.) to build second track across 11 roads and streets in Point Grey municipality, B.C.

16556. May 17.—Dismissing application of Canadian Press, Ltd., requiring Great North West and Western Union Telegraph Cos. to provide special press service tolls similar to C.P.R. and ordering C.P.R., G.N.W. and Western Union Telegraph Cos. to restore rate of 25c per 100 words for press specials in Maritime Provinces, effective by June 17.

16557. May 21.—Authorizing G.T.R., Georgian Bay and Seaboard Ry. (C.P.R.) and C.N. Ontario Ry. to operate over interlocking plant at Atherley Jct. without previously stopping, interlocker being completed.

16558. May 20.—Approving express collection and delivery limits for Grand Falls, N.B.

16559. May 20.—Ordering G.T. Pacific Branch Lines Co. to place crossing on E. D. Sworder's property, Balcarres, Sask., in proper condition for tram traffic by June 30, under penalty of $25 a day.

16560. May 21.—Authorizing C.P.R. to divert Government road, mileage 9.92, on Waldo branch, B.C.

16561. May 20.—Authorizing C.P.R. to rebuild bridges 66.77, 19.7 and 6, Cartier and Havelock subdivisions, and Orford Mountain branch, Eastern Division.

16562. May 21.—Authorizing James Bay and Eastern Ry. (C.N.R.) to build bridge across River a l'Ours, Ashuapmouchouan tp., Que.

16563. May 20.—Approving location of C.N. Quebec Ry. station and baggage room at Sixteen Island Lake, Que.

16564, 16565. May 21.—Approving revised location of C.N. Ontario Ry. Toronto-Ottawa line, west of Newburgh, and authorizing it to cross public road between lots 20 and 21, con. 2, Thorah tp.

16566. May 21.—Authorizing G.T. Pacific Branch Lines Co. and C.P.R. to operate over interlocker at crossing of former's Melville-Regina branch and latter's Bulyea branch.

16567. May 21.—Authorizing C.N. Ontario Ry. to build bridge over Otter Creek, mileage 204 from Toronto.

16568. May 22.—Ordering C.P.R. to instal within 90 days electric bell at main trail near Hesperus, Alta., 20% to be paid from railway grade crossing fund.

16569. May 15.—Approving diversion and crossings of C.P.R. in Purdue rural municipality, 346, Sask.

16570. May 22.—General order re fire prevention on railways.

16571. May 21.—Authorizing Port Arthur and Fort William Electric Ry. to operate over C.P.R. crossing at Pacific avenue, Fort William, Ont.

16572. May 21.—Approving plan A for subway under C.P.R. at 9th avenue east, Calgary, Alta.

16573. May 21.—Authorizing C.P.R. to cross 25 highways with its Swift Current northwesterly branch, and approving location, mileage 78.00 to 111.14.

16574. May 21.—Authorizing C.P.R. to build extension to spur for Dominion Gypsum Co., Winnipeg.

16575. May 22.—General order re forged steel wheels on tender trucks.

16576. May 22.—Authorizing C.P.R. to build cement foot subway at George street, Smiths Falls, Ont.

16577. Mar. 8.—Ordering C.N. Ontario Ry. to erect and maintain a flag station at eastern extremity of Deaf and Dumb Institute grounds near Belleville, Ont.

16578. May 23.—Approving agreement between Bell Telephone Co. and Algoma Steel Co., Sault Ste. Marie, Ont.

16579. May 22.—Authorizing G.T.R. to use jointly with C.P.R., spur to Toronto Furniture Co., Toronto.

16580. May 23.—Authorizing C.P.R. to build second main track across five highways on its Kenora subdivision.

16581. May 23.—Authorizing C.P.R. to build spur for Western Foundry and Machine Co., Saskatoon, Sask.

16582. May 22.—Authorizing Dominion Atlantic Ry. to build its North Mountain branch across highways between Centreville and Weston, N.B.

16583, 16584. May 23.—Authorizing C.N. Ontario Ry. to build bridge over Riviere des Milles Isles, mileage 37.9 from Hawkesbury, Ont., and to cross three highways in Bristol tp., Que.

16585. May 9.—Authorizing C.N. Ontario Ry. to connect temporarily with siding of Canada Cooperage Co. Smiths Falls.

16586. May 23.—Approving C.N. Ontario Ry. revised location in Ross and Westmeath tps., mileage 69.15 to 71.08 from Ottawa.

16587. May 22.—Authorizing C.N. Ontario Ry. to build spur for Shevlin Clarke Lumber Co., Fort Frances.

16588. May 23.—Authorizing St. Cuthbert parish, Que., to build highway across C.P.R. two miles east of St. Cuthbert.

16589. May 20.—Approving G.T. Pacific Ry. location through Fort William, Ont., in accordance with agreement between the city and C.P.R., and rescinding order 8493, Oct. 6th, 1909, in the same connection.

16590. May 27.—Authorizing G.T.R. and C.P.R. to operate over interlocker at Nipissing Jct. without previously coming to a stop.

16591. May 27.—Approving Toronto Eastern Ry. revised location through Whitby and Whitby East tps., Ont.

16592. May 23.—Authorizing G.T. Pacific Ry. to build farm type of crossing over C.P.R. near dock in Vancouver, B.C.

16593. May 27.—Approving C.N. Ontario Ry. revised location through Gibbons and Crerar tps., mileage 267.2 to 271.4 from Ottawa.

16594. May 27.—Approving C.N. Quebec Ry. location through Two Mountains and Terrebonne counties, mileage 16.71 to 33.04.

16595 to 16597. May 27, 23.—Approving Canadian Northern Ry. location through tps. 39-42, r. 1, w. 3 m., to tp. 27 w 2 m., mileage 0 to 26.56 and location of its Alsask southeasterly line through tps. 25-26, r. 15-20, w. 3 m., mileage 49.59 to 85.24; and authorizing it to cross C.P.R. Calgary-Edmonton branch with its Strathcona-Camrose branch in n.w. ¼ sec. 16, tp. 52, r. 24, w. 4 m., Alta., interlocker to be installed.

16598, 16599. May 23, 27.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to connect with Ontario and Quebec Ry. (C.P.R.) at Glen Tay, and approving revised location at Glen Tay to mileage 2.08.

16600. May 23.—Authorizing C.P.R. to build three additional tracks across Wolever Ave. and public lane in Winnipeg.

16601. May 27.—Approving C.P.R. revised location from mileage 0 at Bassano for 35.38 miles, sec. 3, tp. 25 and 22, w. 4 m., Alta.

16602. May 23.—Authorizing C.P.R. to take certain Toronto belt line lands in connection with diversions of St. Clair Ave. and Scarlett Rd., Toronto.

16603. May 27.—Dismissing Bell Telephone Co.'s application re crossing C.P.R. and G.T.R., Brock Ave., Toronto.

16604. May 27.—Authorizing C.N. Ontario Ry. to cross public road on lot 21, r. 2, Clarendon tp., Que.

16605. May 28.—Authorizing Alberta Central Ry. (C.P.R.) to divert trail at Rocky Mountain House by overhead bridge.

16606. May 28.—Authorizing Esquimalt and Nanaimo Ry. to build bridge 4.5 near Victoria, B.C.

16607. May 27.—Dismissing application of Campbellford, Lake Ontario and Western Ry. (C.P.R.) for crossing of G.T.R. at mileage 70.74 from Glen Tay, Ont.

16608, 16609. May 27.—Authorizing C.P.R. to build spurs for W. Bannerman Co.'s ballast pit at mileage 2, Ignace subdivision, Ont., and for E. Hogg, near Agassiz, B.C.

16610. May 28.—Authorizing C.N. Ontario Ry. to cross temporarily concession road in Georgina tp., by agreement with township.

16611. May 28.—Authorizing C.P.R. to connect with G.T.R., take certain lands and divert lanes, etc., near Clarence Sq., Toronto, in connection with freight terminal enlargement.

16612. May 27.—Extending to July 1 time for completion of C.P.R. spur in West Oxford tp., Ont., as authorized by order 15542, Nov. 22, 1911.

16613. May 28.—Further extending to Dec. 1 C.P.R. Telegraph Tolls, C.R.C. 5.

16614 to 16617. May 28.—Authorizing C.P.R. to build two spurs for H. S. Gree, Kildonan parish, near Winnipeg, Man.; Canada Sand-Lime Pressed Brick Co., Symes Rd., Toronto.; British Columbia Brass, Ltd., New Westminster, B.C., and Argenteuil Granite Co., Chatham tp., Que.

16618. May 27.—Authorizing G.T. Pacific Ry. and Midland Ry. of Manitoba to operate trains without stopping over interlocker parish lot 55, St. Boniface, Man.

16619 to 16624. May 28.—Extending to Dec. 1 G.N.W., G.T.P., C.N.R. White Pass and Yukon and North American Telegraph and Bell Telephone Companies' tariff of tolls authorized by former orders or acts 7-8, Edward VII., chap. 61.

16625. May 29.—Extending to July 1, time for completion of fencing Great Northern Ry. from m.p. 63 to 77, as directed by order 16131, Mar. 13.

16626. May 23.—Ordering Canadian Northern Ry. to install improved type of electric bell at Bay Bridge Rd., Belleville, Ont.

16627. May 28.—Authorizing Vancouver, Victoria and Eastern Ry. (G.N.R.) to build dock and warehouse at Burrard Inlet, B.C., and rescinding order 15093, Oct. 16, 1911, to the same effect.

16628. May 29.—Approving C.N. Ontario Ry. revised location through Clarendon tp., Que., mileage 55 to 58 from Ottawa.

16629. May 29.—Authorizing Canadian Northern Ry. to divert public road on its Swift Current extension, Sask.

16630 to 16632. May 30.—Approving C.P.R. plans of bridge 61.51, Woodstock subdivision, N.B., and authorizing it to rebuild bridges 58.59, Cartier subdivision, Ont., and 57.1, Cascade subdivision, B.C.

16633. May 29.—Authorizing G.T.R. to rebuild bridge carrying highway in Caradoc tp., Ont.

16634 to 16636. May 30.—Dismissing application of city of Hamilton, Ont., to continue Lottridge St. across Toronto, Hamilton and Buffalo Ry., Hamilton Radial Ry. and G.T.R.

16637. May 29.—Relieving Great Northern Ry. from erecting and maintaining fences from International boundary to Brandon, Man.

16638. May 29.—Authorizing Essex Terminal Ry. and Michigan Central Rd. to operate trains over crossing at Windsor, Ont., without stopping.

16639. May 29.—Extending to July 1, time for installing derails by G.T.R. at Toronto Suburban Ry. crossing, Keele St. and St. Clair Ave., as ordered by order 16411, Apr. 19.

16640. May 28.—Authorizing city of Lethbridge, Alta., to build crossing over C.P.R. at 13th St., for one year, watchmen to be employed by city.

16641. May 29.—Extending to Aug. 31 time for completion of highway diversion and crossing of C.P.R. at Foam Lake by Saskatchewan Government as authorized by order 15770, Jan. 11.

16642. May 29.—Authorizing G.T.R. to build additional track across Bedford St., Brantford, Ont.

16643. May 30.—Authorizing Quebec Ry., Light, Heat and Power Co. to build spur for Beaupre Sand Co., Ste. Anne de Beaupre, Que.

16644. May 29.—Authorizing Michigan Central Rd. to build spur for Dominion Canners, Ltd., Niagara-on-the-Lake, Ont.

16645. May 29.—Approving location of Vancouver, Victoria and Eastern Ry. (G.N.R.) station at White Rock, B.C.

16646. May 28.—Authorizing C.N. Ontario Ry. to connect with C.P.R. at Meadowside, Nipissing District, for six months for construction purposes only.

16647. May 30.—Approving location of C.P.R. Kerrobert northeasterly branch from mileage 20 to 36.08, Sask.

16648. Apr. 23.—Approving location of C.P.R. freight shed at Saskatoon, Sask.

16649, 16650. May 29.—Authorizing Kettle Valley Ry. to cross highway at mileage 10.5, northwest of Penticton, and to cross six highways in Summerland municipality, B.C.

16651. June 1.—Authorizing C.P.R. to build three spurs for Union Stock Yards Co., Toronto.

16652. May 30.—Relieving Vancouver, Victoria and Eastern Ry (G.N.R.) from erecting fences along certain portion of its line.

16653. May 31.—Authorizing city of Ham-

ilton, Ont., to build subway under G.T.R. near Sherman Inlet (Birch Ave.).

16654. May 29.—Authorizing G.T. Pacific Ry. to build branch into secs. 18 and 7, tp. 53, r. 23, w. 4 m.

16655. May 31.—Authorizing C.N. Ontario Ry. to build spur from its joint section of C.P.R. spur in Parry Sound for Canada Chemical Co.'s smelter.

16656. May 31.—Extending to Oct. 1 time for installation of interlocker by C.N. Ontario Ry. at crossing of C.P.R. and G.T.R. near Ottawa, authorized by order 11386, Aug. 6. 1910.

16657, 16658. May 30, 31.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to cross C.N. Ontario Ry. in lot 27, con. 2, Pickering tp., and Pointe Anne Ry. Co. (Canada Cement Co.), in lot 15, con. 1, Thurlow tp., interlocking plants to be installed.

16659. May 30.—Approving location of Campbellford, Lake Ontario and Western Ry. (C.P.R.) from mileage 72 to 75.45, Ont.

16660. May 27.—Ordering C.P.R. to file within 90 days, plan showing location of junctions with Canadian Nortnern Ry., and interlocking signalling system to govern train movements.

16661 to 16663. May 31.—Dismissing C.P.R. applications to build its Lambton to Weston branch across certain highways in York and Etobicoke tps., and to connect with Toronto to Owen Sound line near Toronto, and to build branch from its Toronto to London line to connect with Toronto to Owen Sound line near Toronto.

16664, May 30.—Authorizing C.P.R. to take certain lands in St. Andrew's ward, Montreal.

16665. May 31.—Ordering that C.P.R. crossing at Dovercourt Rd., Toronto, be protected by day and night watchman, one-half wages to be paid by city of Toronto and one-half by C.P.R.

16666. June 4.—Authorizing G.T. Pacific Ry. to open for traffic its line from mileage 100 to 164 west of Prince Rupert, B.C., speed of trains limited to 25 miles an hour

16667. May 31.—Ordering C.P.R. to install standard gates at crossing in Hartland, N. B., within 60 days, to be operated between 7 a.m. and 6 p.m. daily, 20% of cost to be paid from railway grade crossing fund.

16668. June 1.—Authorizing Vancouver, Westminster and Yukon Ry. and C.P.R. to operate trains over crossing at Burrard Inlet, Vancouver, B.C., without stopping.

16669, 16670. May 30.—Approving location of Campbellford, Lake Ontario and Western Ry. (C.P.R.) from mileage 106.7 to 123 from Glen Tay, and authorizing it to cross Thurlow Ry. by overhead bridge to Canada Cement Co.

16671. June 1.—Ordering G.T.R. to compensate existing landowners on either side of Ferguson Ave., Hamilton, Ont., who were owners prior to establishment of Cannon St. yard, or who have option of purchasing same outright.

16672. June 5.—Authorizinz C.P.R. to open for traffic its double track from St. Martin's Jct. to St. Therese, Que., 7.22 miles.

16673. June 4.—Authorizing G.T. Pacific Ry. to build two spurs for Alsip Brick and Supply Co., Edmonton, Alta.

16674. June 7.—Authorizing G.T. Pacific Ry. to cross and divert highway at mileage 58.3, Alberta.

16675, 16676. June 7, 4.—Authorizing G.T. Pacific Branch Lines Co. to cross two highways on its Biggar-Calgary branch, and to divert road from mileage 36.4 to 36.8 on its Regina-Moose Jaw branch.

16677. June 5.—Authorizing G.T. Pacific Ry. to cross highway at mileage 193.5, r. 6, Cassiar District, B.C.

16678. June 4.—Approving location and plans of G.T. Pacific Branch Lines Co.'s station at Bardo, on its Tofield-Calgary branch.

16679. June 5.—Authorizing G.T.R. to build siding for Canada Brick Co., near Montreal.

16680. June 6.—Authorizing G.T.R. to rebuild bridge 4.90, District 16, near Waterdown, Ont.

16681. May 30.—Authorizing G.T.R. to build two additional tracks across Bay St., Kingston Ont.

16682, 16683. June 4.—Authorizing G.T.R. to build sidings for Bronson Co., Ottawa, and Dominion Flour Mills Co., Montreal.

16684. June 8.—Extending to July 15, time for completion of transfer track, between Brandon, Saskatchewan and Hudson Bay Ry. (G.N.R.) and Canadian Northern Ry., at Minto, Man., as authorized by order 16501, May 10.

16685. June 4.—Extending to Nov. 30, time for for construction by C.P.R. of spur to ballast pit near Marquette, Man., as authorized by order 16289, Apr. 10.

16686, 16687. June 7, 6.—Authorizing C.P.R. to build spurs for F. H. Wiley, Winnipeg, Man., and Hub Roofing and Cornice Works Co., Saskatoon, Sask.

16688. June 8.—Approving location of C.P.R. station at Yahk, B.C.

16689. June 5.—Authorizing C.P.R. to build spur for National Portland Cement Co. near Hanover, Ont.

16690. June 8.—Authorizing C.P.R. to rebuild bridges 86.1 and 57.9, Havelock and London subdivisions, Ont.

16691. May 4.—Authorizing C.P.R. to build spur for Winnipeg Supply Co., Winnipeg.

16692. June 6.—Authorizing C.P.R. to rebuild bridge 113.5, Cascade subdivision, B. C.

16693. June 4.—Authorizing C.N. Ontario Ry. to cross two highways in Ross tp.

16694, 16695. June 4, 7.—Autnorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to take portion of C.N. Ontario Ry. right of way at mileage 79.5, Sidney tp., and approving revised location from mileage 140.63 to 147.89 from Glen Tay.

16696. June 7.—Approving C.N. Ontario revised location through unsurveyed territory, Thunder Bay District, mileage 142.8 to 148.4 from Port Arthur.

16697, 16698. June 4, 6.—Authorizing Canadian Northern Ry. to cross with its Swift Current branch 23 highways in Saskatchewan, and with its Macleod-Calgary branch, 24 highways in Alberta.

16699. May 31.—Authorizing city of Hamilton, Ont., to carry Dunsmure road across Toronto, Hamilton and Buffalo Ry. spur.

16700, 16701. June 1, 4.—Authorizing Edmonton Radial Ry. to cross G.T. Pacific Ry. at Spruce Ave., Edmonton, Alta., and at intersection of 21st St. with Short and Nelson Aves; half interlockers to be installed.

16702. June 7.—Ordering Great Northern Ry. to fence its right of way from Elko, B. C., to international boundary, with exception of where it skirts the Kootenay River, etc.

16703. June 7.—Authorizing Alberta Government to build highway across C.P.R. on north boundary of n.e. ¼ sec. 3, tp. 39, r. 27, w. 4 m.

16704. May 31.—Authorizing Montreal Tramways Co. to rebuild bridge over C.P.R. near Blue Bonnets, Que.

16705. June 5.—Ordering that provision of order 16479, May 10, re classification of gramophones, etc., be put into effect not later than July 15. This order is given in full on another page.

16706. June 5.—Authorizing Peterboro' Radial Ry. to cross C.P.R. and G.T.R. at Park St., Peterboro', Ont.

16707. June 4.—Amending order 16453, of May 6, by substituting 40,000 lbs. for 30,000 lbs. Order 16453 is given in full on another page.

16708. May 31.—Ordering Toronto, Hamilton and Buffalo Ry. to protect Walnut St. crossing, Hamilton, Ont., by day and night watchman; gate question reserved.

16709. June 5.—Recommending to Governor-in-Council agreement between Atlantic Quebec and Western Ry. and Quebec Oriental Ry. for joint shops at New Carlisle, Que.

16710. June 4.—Approving revised rule relating to baggage of excess size as follows:—Commencing July 1, for any piece of baggage of any class, except immigrant baggage checked at port of lading, and whips in canvas or leather cases, the greatest dimension of which exceeds 45 ins., there will be an additional charge for each additional inch equal to the charge for 5 lbs. of excess baggage.

16711. June 7.—Authorizing G.T.R. to build additional team tracks along and across Esplanade St., Toronto.

16712. June 8.—Authorizing C.N. Ontario Ry. to cross public road on lot 11, r. 2, Clarendon tp., Que.

16713. June 8.—Authorizing C.P.R. to open for traffic its double track from mileage 92.4 to 105.7, at Carberry, Man.

16714 to 16717. June 6, 7.—Authorizing C.P.R. to build spur for T. D. Robinson and Sons, Winnipeg; M. Rumely Co., Saskatoon, Sask.; International Harvester Co., Lethbridge, Alta., and Harbor Commissioners, at Bureau Wharf, Three Rivers, Que.

16718. June 8.—Authorizing C.P.R. to cross Saskatchewan Ave., Edmonton, Alta., overhead, and Hardisty Ave., at grade.

16719. June 1.—Approving location of Lake Erie and Northern Ry., from Grand River to Colborne St., Brantford, Ont.

16720. June 10.—Approving change in location of C.P.R. at Vancouver, B.C.

16721. June 10.—Authorizing C.N. Ontario Ry. to open for traffic its line from Trenton to Deseronto and rescinding orders 15211, Oct. 28, 1911, and 15940, Feb. 13, covering same territory in two sections.

16722. June 14.—Ordering G.T.R. to relocate loading siding and to erect fruit shed east of Vineland station, Ont.

16723. June 11.—Approving Algoma Eastern Ry. location across Little Current channel, Ont., between mileage 79.80 and 80.69.

16724. June 4.—Approving G.T. Pacific Ry. plans for freight shed at mission terminals, Fort William, Ont.

16725. June 11.—Approving Georgian Bay and Seaboard Ry. (C.P.R.) plan for interlocker in swing bridge over Trent canal, mileage 44, Ont.

16726. June 13.—Approving Kettle Valley Ry. plan for 250 ft. deck span over Trout Creek, near Penticton, B.C.

16727. June 8.—Authorizing G.T. Pacific Branch Lines Co. to open for traffic its Tofield-Calgary branch from Red Deer, mileage 83.5, to Trouch, mileage 121.4, Alta.

16728. June 10.—Authorizing G.T.R. to build bridges 189, Northern Division, and 77, Ottawa Division, Ont., and approving stress sheets.

16729, 16730. June 10.—Relieving Vancouver, Victoria and Eastern Ry. from erecting fences from Blaine to Brownsville, B.C.

16731. June 11.—Extending to July 15, time for C.N.R. to put tracks at Saskatoon, Sask., in good shape.

16732 to 16735. June 11, 10.—Ordering Dominion Atlantic Ry. within 60 days to install improved electric bells at four street crossings in Windsor, N.S., 20% of cost to be paid from railway grade crossing fund.

16736. 16737. June 11, 13.—Approving C.N. Ontario Ry. revised location through Torbolton and Fitzroy tps., Ont., mileage 27 to 37.01 from Ottawa; and through Fitzroy, Onslow and Bristol tps., Que., mileage 36 to 40 from Ottawa.

16738. 16739. June 14, 12.—Authorizing C.N. Ontario Ry. to build across Leamy Creek, Nepean tp., and approving revised location through Barron and White tps., Nipissing district.

16740. June 14.—Authorizing Canadian Northern Ry. to cross with its Vonda northerly line, 11 highways in Saskatchewan.

16741. June 14.—Authorizing G.T. Pacific Ry. to build across highway at mileage 194.8, Cassiar district, B.C.

16742. June 13.—Approving location of G.T.R. new station at Stratford, Ont.

16743. June 14.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to cross two highways in East Whitby tp., Ont.

16744. June 13.—Authorizing C.P.R. to build additional track across highway at mileage 107.38, on Cascade subdivision, B.C.

16745, 16746. June 12, 14.—Authorizing C.P.R. to rebuild bridges 17 and 17.9, Swift Current subdivision, Sask., and relieving it from further protecting crossing of Main St., Walton, Ont.

16747. June 15.—Ordering Central Vermont Ry. to extend its siding at Stone, Que.

16748. June 17.—Authorizing G.T.R. to build two sidings across William St., Kingston, Ont.

16749. June 8.—Authorizing C.P.R. to take lands at Leaside Jct., for new station site, and approving location of site.

16750 to 16754. June 13, 11, 14.—Authorizing C.P.R. to build spurs for Alaska Bedding Co., Regina, Sask.; J. McDiarmid Co., Calgary, Alta.; American Lumber Co., Sumas Jct., B.C.; Canadian Sardine Co., Chamcook station, N.B., and Saskatoon Lumber Co., Saskatoon, Sask.

16755. June 14.—Authorizing C.P.R. to build two additional tracks across road allowance at mileage 176.57, Calgary subdivision, Alta.

16756. June 14.—Rescinding order 16713, June 8, and authorizing C.P.R. to open for traffic its double track from mileage 98 at Melbourne to Carberry, Man., mileage 106.

16757. June 10.—Extending to July 15, time for C.P.R. to complete fencing on its Moose Jaw southwesterly branch, ordered by 15864, Feb. 1.

16758. June 15.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to cross 12 highways in Bedford and Hinchinbrooke tps., Ont.

16759, 16760. June 8, 15.—Authorizing C.P.R. to build bridge 0.3 over Saskatchewan River, Calgary subdivision, Alta., and to rebuild bridge 124.4, Muskoka subdivision, Ont.

16761, 16762. June 13, 17.—Authorizing C.P.R. to build additional track across highway at Westminster Jct., New Westminster, and at Kyle St., Port Moody, B.C.

16763, 16764. June 14.—Approving changes in location of C.P.R. stations at Plaisance, Que., and Hammond, Ont.

16765 to 16768. June 15, 13, 10.—Authorizing G.T.R. to build spurs for British Canadian Canners, Cobourg, Ont.; Dain Manufacturing Co., Humberstone tp., Ont.; London Concrete Machinery Co., London, Ont., and Alaska Feather and Down Co., Montreal.

16769. June 11.—Authorizing G.T.R. to rebuild bridge at milepost 20.56, district 22, Waterloo tp., Ont.

16770, 16771. June 13, 15.—Authorizing G.T. Pacific Ry. to cross two highways in Cassiar and Coast districts, B.C.

16772, 16773. June 8, 15.—Authorizing G.T. Pacific Branch Lines Co. to build station at Prongua on its Cutknife branch, Sask., and approving location of station at Rowatt, Sask.

16774. June 13.—Authorizing G.T. Pacific Ry. to cross highway at mileage 90.5, North Alberta district.

16775. June 17.—Authorizing G.T. Pacific Branch Lines Co. to take possession of C.P.R. land for right of way of its Tofield-Calgary branch.

16776, 16777. June 10. 17.—Authorizing Algoma Eastern Ry. to build swing bridge at Little Current, between Goat and Manitoulin islands, and to connect with C.P.R. Sault branch and Canadian Copper Co.'s spur, Drury tp., Ont.

16778. June 11.—Authorizing Algoma Central and Hudson Bay Ry. to cross highway between Cathcart St. and Wilde Ave., Tagona, Ont.

16779. June 11.—Approving C.P.R. plans of subway at Jasper Ave., and bridges at McKay and Victoria Aves., Edmonton, Alta.

16780, 16781. June 10, 15.—Authorizing C.N.Ontario Ry. to cross eight highways in Ross and Westmeath tps., and to cross Nicholas Creek, Marlborough tp.

16782, 16783. June 17, 13.—Authorizing Canadian Northern Ry. to cross with its Alsask southerly extension, 13 highways, and with its Swift Current extension, six highways in Saskatchewan.

16784. June 8.—Approving British Yukon Ry. bylaw 12, authorizing O. L. Dickeson, President, to prepare and issue tariffs.

16785. June 15.—Approving clearances for Vancouver, Victoria and Eastern Ry. dock and warehouse at Burrard Inlet, B.C.

16786. June 14.—Authorizing Toronto, Hamilton and Buffalo Ry. to build spur for G. Frid Co., Hamilton, Ont.

16787. June 10.—Authorizing Vancouver-Nanaimo Coal Co. to use bridge across Esquimalt and Nanaimo Ry., Mountain district, Vancouver Island, B.C.

16788, 16789, June 15.—Authorizing C.P.R. to build spurs for Gorman, Clancy and Grindley, Edmonton, Alta., and O. Lemaire, Cabane Ronde, Que.

16790. June 10.—Authorizing C.P.R. to change location of tracks and make alterations in bridges across Mountain, Aqueduct and Guy Sts., Montreal.

16791. June 13.—Authorizing G.T.R. to build siding for Dominion Canners, Simcoe, Ont.

16792. June 15.—Authorizing C.N. Ontario Ry. to cross McCawley's Creek, Nepean tp.

16793. June 17.—Authorizing Canadian Northern Ry. to build bridge on land of T. Tall, Rosebud Creek, Alta., within 30 days.

16794. June 17.—Amending order 16061, Mar. 2, re newspaper rates from Winnipeg to Calgary, by striking out "minimum charge 10c." at end of par. 2 of clause (b), to points not over 300 miles distant.

16795. June 19.—Apointing F. Blois, mayor, New Carlisle. Que., and D. W. Mill, Q. L.S., as arbitrators between Quebec Oriental Ry. and L. J. Riopel, re payment for lands.

16796. June 18.—Authorizing Essex Terminal Ry. to open for freight traffic its line through Windsor, Sandwich West tp., and Sandwich, Ont.

16797. June 18.—Amending order 16706, June 5, which authorized Peterboro Radial Ry. to cross C.P.R. and G.T.R. at Park St., Peterboro', Ont.

16798. June 19.—Extending to Oct. 31, time for completion by Toronto Eastern Ry. of spur to Durham Rubber Co., Bowmanville, Ont.

Great Northern Railway Lines in Canada.

Port Arthur and Fort William, Ont.—Press reports are again current that the company has survey parties in the field locating lines to Port Arthur and Fort William, Ont., from the International boundary.

Brandon, Saskatchewan and Hudson Bay Ry.—The Board of Railway Commissioners has directed the company to build transfer tracks to connect with the Canadian Northern Ry. at Minto, Man.

Montana-Swift Current-Edmonton—A press report from Swift Current, Sask., states that G.N.R. engineers are making a survey for a line from the International boundary, north of Plentywood, Mont., passing through Swift Current, to Edmonton, Alta.

Vancouver, Victoria and Eastern Ry. and Navigation Co.—L. W. Hill, Chairman, G.N.R., on the occasion of his recent visit to Vancouver, B.C., is reported to have stated that the construction of the line across the Hope Mountains would be started just as soon as the question of the route had been disposed of by the Board of Railway Commissioners. The company was ready to build its own line, or to work jointly with the Kettle Valley Lines.

It is reported that the company proposes to establish car shops in the vicinity of Coquitlam, B.C. A new station is to be built at once at New Westminster.

Vancouver Terminals.—J. D. Mason, Chicago, Ill., and A. Stewart, of the G.N.R. engineering staff, Seattle, Wash., were in Vancouver, early in June, looking over the work in progress at the site of the new terminals, False Creek.

The work is being pushed along rapidly, and L. W. Hill is reported to have stated on his recent visit that as soon as sufficient filling had been done on the site of the proposed union station near the foot of Park Lane, the building of the station would be started, and that the cost of the building would be over $500,000.

Victoria and Sidney Ry.—L. W. Hill had an interview with the Premier at Victoria, B.C., June 7, at which it is reported that the question of the sale of the V. and S. Ry. to the Canadian Northern Pacific Ry. was discussed. (June, pg. 296.)

The Central Railway of Canada's Bond Issue.

At a recent meeting of bondholders of the Central Ry. of Canada, in London, Eng., called to deal with the proposed release of the land grant subsidy comprised in the trust deed from the security on the bonds being converted into bonds guaranteed by the Dominion, Ontario or Quebec governments; and the modification of the conditions under which the proceeds of the bonds are to be applied by the trustees, C. N. Armstrong, who presided, stated that owing to there not being a quorum present, no business could be done. He said that the whole object of the company was to get the bondholders' opinion as to whether they would prefer to get the bonds guaranteed by the Dominion Government or get what was expected in place of the bonds they now held. Ninety-five per cent. of those he had been able to see, or those he had heard from, were entirely in favor of exchanging the bond, worth, say 95%, for a bond which would be worth at least par. There were only four bondholders who would prefer to stick to their land. Members of the Stock Exchange only represented about 5% of the bondholders. The total amount of debentures issued was £600,000, and the balance of £400,000 was all ready to be taken up on certain conditions. The cash in hand was about £125,000, and there were ample funds to carry on the whole of the work to be done this year, which was going on satisfactorily. He gave a history of the original land grant, and read an opinion by Sir Charles Cripps, K.C., as to its validity.

The C.P.R. put in operation June 2, a solid sleeping car train between Winnipeg and Calgary. It runs an hour ahead of the regular trains between these cities.

J. G. SCOTT, ex-General Manager, Quebec and Lake St. John Ry., in remitting his renewal subscription, says: "The Railway and Marine World is the best value for $1 that I know of ."

Dominion Government Railway to Hudson Bay.

Hon. R. Rogers, Minister of the Interior, speaking at Regina, Sask., June 11, is reported to have said that much progress was being made with surveys, and he hoped that the Government would be in a position to call for tenders within 30 or 40 days for the remaining distance to the Bay. If the eastern railway companies, he added, did not make connection with the Government line, the Government itself would build the connections.

An advertisement has since been issued stating that tenders will be received to Aug. 1 for the construction of a section of the line, from Thicket Portage, where the J. D. McArthur contract ends, to Split Lake Jct., 68 miles.

A contract is reported let to E. M. Joyle and Co. for the supply of 170,000 ties for the mileage now under construction.

A party of engineers under H. T. Hazen, it is reported, left Montreal, June 8, for Port Nelson to make surveys in connection with the proposed terminals. (June, pg. 267.)

Protection of Railway Employes in Yards.

The Board of Railway Commissioners has notified railway companies to show cause by July 2 why an order should not be issued as follows:—

Re memorial of Trainmen's Association of Canada for the adoption of certain regulations by the Board, having in view the protection of employes of the railway companies, it is ordered:

Railway companies under the Board's jurisdiction shall file with the Board, on or before Oct. 1, 1912, a statement of its yards, limits of which are indicated by yard limit boards, showing the distance that these boards are located from the outer switches of such yards.

Before any company shall proceed to erect any yard limit board upon its right of way after the date of this order, it must first obtain the Board's approval to the location of such yard limit board.

After Oct. 1, 1912, rule 93 of the approved uniform rules for the operation of Canadian railways shall apply only to yards where locations of yard limit boards have been approved by the Board.

Probable Sale of Temiscouata Railway.

An Ottawa press report states that negotiations are in progress for the acquiring by the C.P.R. of the Temiscouata Ry., which is owned by the same interests in England, from whom the C.P.R. recently acquired the Quebec Central Ry.

The Temiscouata Ry. runs from Riviere du Loup, Que., on the Intercolonial Ry., to Connors, N.B., 113 miles. It connects at Edmundston, N.B., with the C.P.R. branch line from St. John, along the St. John River Valley, via Fredericton.

The Longest Metal Shaving.—A United States technical paper recently claimed that the longest metal shaving had been produced in the U.S., measuring 155 ft. A previous one produced by the same machinist measured 121 ft., while the best previous record ever reported was from the Santa Fe Ry. shops at Topeka, where a shaving of 110 ft. was turned out. These "records" were beaten before they were made, as there has been on exhibit for several years, in the museum attached to the Belle Vue Zoological Gardens, Manchester, Eng., a steel turning, 166 ft. long, taken from a 68 ton gun, at the works of Sir Joseph Whitworth and Co., Manchester.

Traffic Department Established by the Toronto Board of Trade.

The Toronto Board of Trade has established a traffic department under the supervision of its railway and transportation committee, and has appointed as Manager, T. Marshall, heretofore Chairman, Canadian Freight Association Eastern Lines.

A report from a special committee of the board's executive, submitting an outline of the work to be done by the traffic department, says it will embrace the adjustment of freight and express, the provision of facilities for freight handling, convenient train service, commutation and excursion rates. The department will keep on file a complete set of freight, passenger and express tariffs for the information of members.

Mr. Marshall entered railway service, Aug., 1882, since when he has been, to March, 1883, operator, Northern and North Western Ry., Elmdale, Ont.; Apr., 1883, to Dec. 1885, operator and ticket agent, same road, Allandale, Ont.; Jan., 1886, to Sept., 1887, relieving agent, same road; Mar., 1887, to June, 1899, chief clerk, Traffic Manager's office. Lake Erie and Detroit River Ry., Walkerville, Ont.; July, 1899, to Nov., 1901, Assistant General Freight and Passenger Agent, same road; Dec., 1901, to Jan., 1904, General Freight Agent, same road; Feb., 1904, to Jan., 1905, General Agent, Pere Marquette Rd., London, Ont.; Jan. to July, 1905, Division Freight Agent, same road, London, Ont., at which latter date he was apointed Secretary-Treasurer, Canadian Freight Association. On May 1, he was apointed Chairman of the Association.

Association of Railway Telegraph Superintendents.

The annual convention of this association was held at New York, June 4-6. Committee reports on various matters were read, and the committees continued. Papers were also read on construction materials and methods, handling of supplies, polarized sounder in telegraphy, telegraph and telephone facilities at St. Louis terminal, telegraph traffic, maintenance of telegraph lines, the portable telephone in railway service, etc.

In the discussion on construction materials and methods, W. J. Camp, Assistant Manager, C.P.R. Telegraphs, Montreal, described in detail the company's practice and experience regarding the size of poles, spacing of wires on cross arms, insulators, underground service, etc. He favored porcelain insulators, and showed samples as used on the C.P.R. He also stated that the company used nothing but tile conduit for underground service, and that the Board of ailway Commissioners required the use of double cross arms at crossings.

A letter was read from J. Kent, Manager, C.P.R. Telegraphs, giving an account of an experience in the use of dry batteries at Sudbury, Ont., during a flood which submerged the storage battery.

Among Canadians present in addition to Mr. Camp, were: T. Rodger, Inspector of Telephones, G.T.R., and A. Dwight Smith, Northern Electric and Manufacturing Co., Montreal; W. Marshall, Superintendent, and G. T. Rooke, Inspector of Transportation, C.P.R. Telegraphs, Toronto.

Telegraph and Cable Matters.

E. A. Stainton, night chief operator, Great North West Telegraph Co., Montreal, was presented with an electric reading lamp, by the operating staff, recently, on leaving the service.

W. F. Ryan, who has been connected with C.P.R. Telegraph service for 25 years, latterly as Assistant Manager of the Montreal office, resigned recently on his appointment as Secretary of the National Bond Co., Montreal.

The Boundary Creek Telegraph and Telephone Co. has been notified that it will be struck off the B.C. Companies register, unless cause be shown to the contrary, for failure to comply with the regulations as required by the Companies Act.

The Minister of Trade and Commerce, who is visiting England, will probably discuss the question of linking up the various islands comprising the British West Indies, by cable, following out the suggestions of the Dominion and West Indies delegates at the recent trade conference at Ottawa.

The Board of Railway Commissioners has further extended, to Dec. 1, the tariffs of telegraph tolls of the C.P.R., White Pass and Yukon Ry., and the G.T. Pacific, Canadian Northern, Great North West and North American Telegraph Cos., which have been authorized by previous orders, and 7 and 8, Ed. VII., chap. 61.

The Western Union Telegraph Co. has announced that it has entered into an agreement with the Marconi Wireless Telegraph Co., for general interchange of business to and from Europe. The agreement also provides for the extension of the service from the Pacific coast to Hawaii, China, Japan and the Philippine Islands.

The Toronto board of control has recommended that the city solicitor apply to the Board of Railway Commissioners for an order to compel all Dominion companies having overhead wires in Toronto, to place them underground in accordance with the Dominion acts. It was also suggested that a conference should be arranged between the authorities and the companies concerned, with a view to abolishing overhead wires.

The installation of the Dominion Government telegraph line between Vancouver and Powel River, B.C., is in progress. The line will run from North Vancouver to Point Atkinson and from there to Howe Sound. Several of the sections will necessitate the use of a cable, and it is expected that the work will be completed by August. The branch line from 150-mile House to Bella Coola, across the Chilcoten country, is being pushed forward.

The Board of Railway Commissioners recently dismissed the application of Canadian Press, Ltd., requiring the Great North West Telegraph Co., and the Western Union Telegraph Co., to provide special tolls for press service, similar to those provided by the C.P.R., and ordered the C.P.R., the Great North West and Western Union Telegraph Cos. to restore the rate of 25c per 100 words for press specials in the Maritime provinces. This order came into effect June 17.

Work has been recommenced on the extension of the St. Barbe telegraph line, Newfoundland. At the conclusion of last season's operations, the line had reached Griquet, where an office was opened, thus putting in operation 300 miles of line. During the winter, poles were cut and placed along the route from Griquet to Locks Cove in Hare Bay, to which latter point, 45 miles, the line will be completed as soon as possible. From Locks Cove the line is to be continued to Croc and Conche, and possibly to Englee, before the end of the season.

The C.P.R. has opened telegraph offices at Banff Hotel, Beiseker, Cluny, Czar, New Dayton, Parkland, Standard and Tilley, Alta.; Ainsworth, Chilliwack, Clayburn, Craigellachie, Galloway, Nicomen Quarry, Taft, Whonnock and Wycliffe, B.C.; Bergen Station, Tilston Station, Man.; Eau Claire, Grand Valley Station, Jeannettes, Port Burwell and Port McNicoll, Ont.; Chelsea Station, Hebert, Ivry, St. Guillaume and Val Morin, Que.; Aikins, Deviot, Denzil, Dilke, Druid, Forres, Holdfast, Penzance, Regina Beach, Silton and Simpson, Sask.

At the annual meeting of the Marconi Wireless Telegraph Co., in London, Eng., June 10, the net profits for 1911 were shown to be $708,585, against $307,565 for the previous year. A final dlvidend of 1% on both classes of shares was declared, making 17% for the year on the preference and 20% on the ordinary stock, and for the current year, first interim dividends of 7% on the preference and 10% on the ordinary stock were declared. G. Marconi stated that the amount due to the company from the Canadian company was reduced in 1911 from $819,330 to $392,940, but this would probably be increased during the current year, as financial assistance was being given the Canadian company for further development.

Railway and Allied Associations, Clubs, Etc.

The names of persons given below are those of the secretaries.

CANADIAN CAR SERVICE BUREAU, J. E. Duval, 401 St. Nicholas Building, Montreal.

CANADIAN FREIGHT ASSOCIATION (Eastern Lines), T. Marshall, Canadian Express Bldg., Montreal.

CANADIAN FREIGHT ASSOCIATION (Western Lines), W. E. Campbell, 502 Canada Building, Winnipeg.

CANADIAN RAILWAY CLUB, J. Powell, St. Lambert, Que. Meetings at Montreal 2nd Tuesday each month, 8.30 p.m., except June, July and August.

CANADIAN SOCIETY OF CIVIL ENGINEERS, C. H. McLeod, 413 Dorchester St. West, Montreal.

CANADIAN STREET RAILWAY ASSOCIATION, Acton Burrows, 70 Bond Street, Toronto.

CANADIAN TICKET AGENTS' ASSOCIATION, E. de la Hooke, London, Ont.

CENTRAL RAILWAY AND ENGINEERING Club of Canada, C. L. Worth, 409 Union Station, Toronto. Meetings at Toronto 3rd Tuesday each month, except June, July and August.

EASTERN CANADIAN PASSENGER ASSOCIATION, G. H. Webster, 54 Beaver Hall Hill, Montreal.

ENGINEERS' CLUB OF MONTREAL, R. W. H. Smith, 9 Beaver Hall Square, Montreal.

ENGINEERS' CLUB OF TORONTO, R. B. Wolsey, 94 King St. West, Toronto.

NOVA SCOTIA SOCIETY OF ENGINEERS, A. R. McCleave, Halifax, N.S.

QUEBEC TRANSPORTATION CLUB, J. S. Blanchet, Quebec.

WESTERN CANADA RAILWAY CLUB, W. H. Rosevear, 25½ Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month except June, July and August.

Dominion Express Company.

J. A. Boswell, Superintendent Eastern Division, retired from active service June 30.

Effective July 1, lines east of Port Arthur will be subdivided as follows:—

Atlantic Division—All offices in New Brunswick, Nova Scotia and Quebec (except C.P.R. Mattawa and Temiskaming branch). V. G. R. Vickers, Superintendent. Office, Montreal.

Eastern Division.—All offices in Ontario east of Port Arthur, including C.P.R. Mattawa and Temiskaming branch. J. J. Murray, Superintendent. Office, Toronto, Ont. The Southern Division, of which J. J. Murray has been Superintendent, is abolished and offices are now included in Eastern Division.

Electric Railway Department

The Ottawa Electric Railway and its Employes.

The conciliation board, consisting of Judge McDougall, chairman; Travers Lewis, K.C., representing the company, and P. M. Draper, on behalf of the employes, recently appointed under the Industrial Disputes Investigation Act, to hear the complaints of the Ottawa Electric Ry. employes, submitted a unanimous report to the Department of Labor, June 12.

The demands of the men were embodied in the form of an agreement, which they asked to be entered into by the company and the Amalgamated Association of Street and Electric Railway Employes of America, Division 279, and covered the following points—the discussion of questions with a duly accredited committee of the association; the division of runs into regular and relief runs, conforming, as nearly as possible to a 9 hour day; priority of runs according to seniority; preference in leave of absence for employes who are officers of the association for transacting association's business; clothing for conductors and motormen to consist of, full suit, coat, vest and trousers for summer, and for winter, trousers every year and overcoat every second year, the company to pay full cost for all men over one year service, and half cost for those in the first year; caps and badges to be supplied without charge; the right of appeal, in case of suspension or discharge, to the President in person, or through the officers of the association; running of cars for conveying employes to their work; provision of suitable seats for motormen and conductors on all cars; cleaning of cars to be done by shed men; free transportation at all times on all company's lines; double time for extra work in excess of regular day's schedule; six days to constitute a week's work; canopy switches in all cars over or near controller; time and a half to be paid for working on statutory holidays; permission to post notices of association's meetings on office bulletin board; one year leave of absence in the case of an employe being elected business agent for the employes, to be renewed in case of re-election; wages to be paid as follows:—30c an hour for week days, work to be performed between 6 a.m. and 12 midnight; 32c an hour for Sundays; 34c an hour between 12 midnight and 6 a.m.; for shop, shed and line men, nine hours to constitute a day's work, with one hour off for dinner; time and a half for overtime; double time for Sundays; double time between 6 p.m. and 6 a.m., if required to work all night; time and a half for statutory holidays; 5c an hour increase for all men employed in shop, shed and line work; no discrimination against members of the association; agreement to remain in force to May 1, 1913, and from year to year thereafter, unless changed, each party desiring a change to notify the other 30 days prior to the expiry of each year.

In response to these demands, the company replied to the effect that it declined to enter into an agreement with a union on matters relating to the conduct or management of its business, this reply affecting 14 of the 22 requests involving that principle. Six of the remaining requests were already in force, and the remainder, covering the rates of wages and the hours of work the company stated that it was prepared to discuss with a committee of its motormen and conductors. The conciliation board held 12 sittings, at which the company's side was given by J. E. Hutcheson, Superintendent, and J. D. Fraser, Secretary-Treasurer, and the men's by M. Sinclair, C. Ryan and J. O'Brien. The board's report classified the demands as follows:—(a) increases of pay; (b) hours of work; (c) recognition of the association; (d) other rules and conditions of employment not included in the foregoing, and it was agreed that the items coming within (d) should continue in force, that those under (b) and (c) be waived, and that the following scale of wages take effect July 1, lasting until, at least, July 1, 1914:—

For conductors and motormen—first year, 21½c an hour for week days, 23½c for Sundays; second year, 22½c for week days, 24½c for Sundays; third year, 25c for week days and 27c for Sundays. For shop and line men, an increase of 1½c an hour throughout.

The old rates of pay were as follows—for first year men, 20c an hour week days, 22c Sundays; second year, 23c an hour weekdays, 25c Sundays; third year, 23c an hour weekdays, 25c Sundays; the rates for shop and shed men now range from 22½c to 36c an hour, according to the class of work, and for line men, from 20c to 23c an hour.

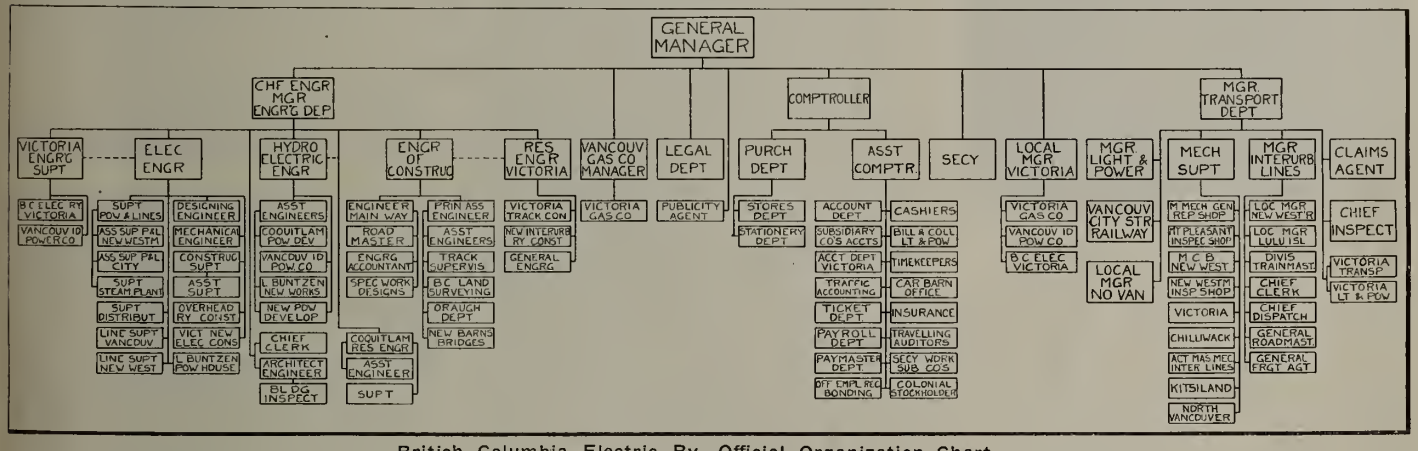
The company also agreed, as heretofore, except in cases of personal dishonesty, to meet and treat individual employes, or a committee of such employes, on grievances or disputes which may arise between them and the company.

The report states, that, as mentioned in the report of a like board in 1908, from the observations of this board and statements made at its sittings, it is evident that the Ottawa Electric Ry. takes much interest in its employes and provides for their comfort and convenience in a very generous manner, and that consequently it has an exceptionally capable and well set up body of men, who provide an excellent public service. Although not convinced of the justice of any advance in wages, T. Ahearn, President, on behalf of the company, ultimately agreed to the proposition in a very generous spirit, thus enabling the board to make a unanimous report.

It was subsequently stated that the employes had accepted the report, with the exception of one of the conditions of employment which prohibits the wearing of any badge or emblem on the uniforms supplied by the company, when on duty. In order to participate in the increased wages they will also have to accept the decision re badges, etc.

The British Columbia Electric Ry. Co.'s Official Organization

The B.C.E.R. Co. with 182.6 miles of line, has much the largest mileage of any electric railway in Canada, the Toronto Ry., including the Toronto and York Radial Ry., coming second with 126.49 miles, and the Montreal Tramways Co. third with 124.26 miles.



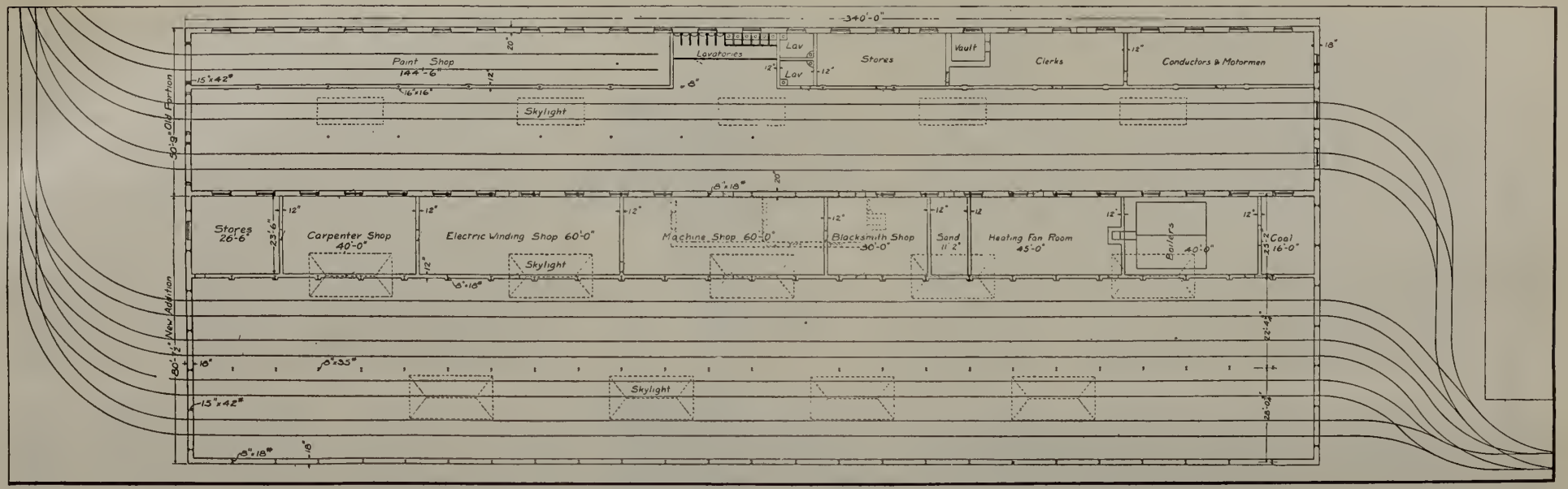
British Columbia Electric Ry. Official Organization Chart.

The B.C.E.R. operates three city railways in Vancouver, New Westminster and Victoria. It has alternative interurban lines between Vancouver and New Westminster, the longest suburban line in Canada, between Vancouver and Chilliwack, 64 miles, and several other suburban lines in the vicinity of Vancouver, New Westminster and Victoria. It also carries on a large lighting and power business, and has invested a tremendous amount of British capital in a magnificent system, including some remarkable water power developments.

Necessarily, on account of its varied interests and the territory covered by its activities, it has a large official organization, the arrangement of which cannot fail to be of interest to electric railway officials generally, and we therefore give herewith a chart of the organization, for which we are indebted to R. H. Sperling, General Manager.

The Canadian Electrical Association's 22nd annual convention was held at Ottawa, June 19-21.

The action of the Winnipeg Electric Ry. against the city of Winnipeg, to obtain an order for the removal of the city poles and overhead wires, where they are in proximity to the company's system, and for relief on other points, came before the court June 10.



The Quebec Railway, Light and Power Co's New Car Shed and Repair Shops.

To meet the requirements of the increasing rolling stock which needed greatly increased accommodation, the Quebec Railway, Light and Power Co. has built an addition to its car storage shed at St. Sauveur, a suburb of Quebec city, in the lower part of the town near the St. Charles River. For some years the company has had a storage shed on the site of the present structure, where the summer cars were stored in winter, and vice versa; the shed was used for no other purpose, being closed for the season on the storage of the particular series of cars that were not required. The car sheds in the upper part of the town, where the cars in daily service were stored and where the car repair shops were also located, were rapidly overcrowding, and in addition, the repair shop facilities were not of the best under the cramped conditions that prevailed, the heavier repairs being confined to one corner of the car shed, with the lighter repairs removed to the more spacious basement, where a number of the machine tools were located.

On the decision to remove the repair shop and to increase the daily storage space, attention was turned to the old storage shed in the lower part of the town, especially as it was not advantageous to have to bring all the rolling stock up on to the hill each night, as the heavy traffic in the morning and evening hours is in the lower part of the town, where the working classes reside. In consequence, the old storage shops were taken as a base and a new addition added, which has made the commodious arrangement as outlined in the accompanying plan of the complete shop, accommodating 70 cars.

The old shed was 340 by 50¾ ft., and is the upper portion of the structure shown in the illustration. Originally, this portion had three through tracks the length of the shed, and in addition, a couple of lean-to buildings along the lower side for the heating plant, etc., which are shown about the centre of the plan of the new shops. These were first of all removed to provide space for an addition 80 ft. 7½ ins. wide the full length of the old portion along the lower side. The part adjoining the old structure is divided along the full length into the various shops and auxiliary departments, and the part below that has four through tracks, each one with a repair pit running half the length of the shed at the front end.

The new shed is of a different type of construction from that of the old building. The latter is a brick structure, with the roof supported on 8 in. cast iron columns in two intermediate rows down the centre of the shop, while the newer portion has a more lightly constructed brick wall built around 8 in. by 18 lb. I beams at a 13 ft. spacing along the side wall, with the entrances at both ends constructed of unsupported 15 in. by 42 lb. I beams, one between each of the tracks. Down the centre of the four track space there is a row of 8 in. by 35 lb. I beams spaced the same as the side wall columns. In the new wall partitioning off the central shops, similar columns to those in the outside wall are employed.

Parallel with the top wall of the old section of the shops there is a wall running nearly all the way down that side of the shop, dividing off a third of the shop. The front section of the divided off portion, 144½ ft. in length, is used for a paint shop, the car entrance being from the front of the building. To the rear of this large room the general and private lavatories are located. Back of this is the store room communicating with the clerks' room to the rear. The room furthest to the rear is the rest room for conductors and motormen. Other than the addition of these dividing walls, the old shop is the same as formerly.

The various shops in the new addition are midway between the storage tracks in both the old and new parts, along the centre of the complete building, with doors communicating with both parts. This provides a flexible arrangement that may be increased in the future by the addition of further tracks along the lower wall. Beginning at the front end, the four repair shops are in the order given, all 25 ft. 2 in. wide; carpenter shop with track down centre, 66½ ft. deep; electric winding shop, 60 ft. deep; machine shop, 60 ft. deep; and blacksmith shop, 30 ft. deep. Behind this there is a sand room 11 ft. 2 ins. deep, adjoining a 45 ft. heating fan room containing a complete heating installation. To the rear of this are the boilers in a 40 ft. room with a 16 ft. coal bin at the extreme rear.

This heating apparatus is of the hot air blast type, the air passing through heating coils and by means of fans the air is distributed to shop by pipes, ventilators being placed along these at convenient places to ensure a regular heating of the shops and sheds.

In the various shops the machinery and equipment from the upper town shops is installed, along with considerable new machinery, that make the shops in every sense an up-to-date repair plant to handle all the repairs of the city section of the company's lines. The new machinery installed is as follows:—Carpenter shop, circular and band saws, wood lathe and a wood planer; electric winding shop, armature banding machine; machine shop, new shafting and belting, air compressor with long hose for cleaning cars; and blacksmith shop, new forge and blower, anvil and water tank.

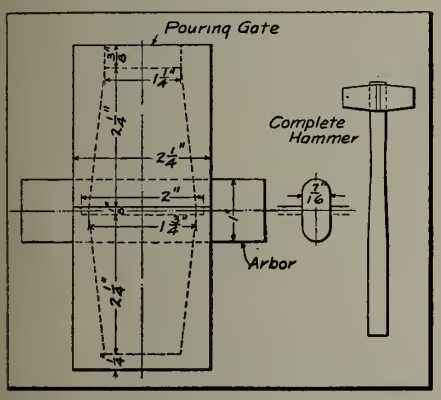
The sheds are not located on a regular car line, but are about two blocks distant, connecting with a through line by means of a single track loop, which leads into the sheds from the left end, the cars passing out through the other end, a track on another street leading to the through line. The entrance to the shed are through rolling metal doors, which roll up into a cage over each.

The completed shops are now in service and will help in the handling of the heavy summer traffic that comes to such a historic old town as Quebec.

Lead Hammer Mould at Halifax Electric Tramway Co.'s Shops.

The use of a lead hammer on an assembling job where parts that are more or less completely finished are to be handled, is almost an absolutely indispensable tool. It will be found in the majority of repair shops, whether they be on steam or electric lines.

At the Halifax Electric Tramway Co.'s shops, D. B. Logan, Foreman Machinist, has made up a simple mould for casting these hammer heads. As all who have had occasion to use them know their life is very short, requiring frequent replacing. The construction of the mould is shown in the accompanying illustration. The body of the hammer head is made in the form of a double frustum of a cone, tapering from the centre towards the ends as the sketch of the completed hammer indicates. In consequence, the mould is made in two sections, each



Mould for Casting Lead Hammer Heads.

part containing the form for an end, the taper allowing for the draw. A recessed ring at the centre in the upper face of the lower section, receives a corresponding protecting ring on the lower face of the upper mould form, aligning the two sections. An arbor, contained half in each contact face of the two parts, leaves a hole through the centre of the cast head the shape of a standard hammer handle end. The mould, held together in the position shown, is poured from a gate in the upper end, a small settling space being left in the upper end for shrinkage.

The hammer thus made is simple in construction and at the same time it is quite shapely. It is ready for removal shortly after pouring, so that several may be made up with one heat of lead, with little intervening loss of time from delay in cooling. The steel body of the mould forms a very good heat absorbing medium for quickly cooling the hammer head in the mould.

Sunday Operation on the London and Lake Erie Railway.

At the Toronto Assizes, June 4, the Chancellor heard the case of W. Kerley, of St. Thomas, Ont., against the London and Lake Erie Ry, claiming three penalties of $400 each for operating the line on three Sundays in Dec., 1911, or, as an alternative, an order to restrain the railway from operating on Sunday, the case having been entered by the Ontario Railway and Municipal Board's consent.

The plaintiff relied on the section of the Ontario Railway Act which provides that "no company operating an electric railway shall operate the same or employ any person thereon on the first day of the week, commonly called Sunday, except for the purpose of keeping the track clear of snow or ice or for the purpose of doing other work of necessity."

Counsel for defendants repudiate the jurisdiction of the Province, claiming that the company was incorporated by the Dominion Parliament, that the line is run in conjunction with the G.T.R. and other transportation companies, and is amenable only to the Dominion. It is also claimed that, as the late J. P. Mabee, sitting as chairman of the Board of Railway Commissioners, refused to adjudicate or authorize action, the court has no jurisdiction.

Defendant also relies on that part of the Railway Act which gives exemption to a system running in a continuous line between points in different provinces or to a foreign country or which lies between ports on the great lakes.

Chancellor Boyd gave judgment, June 25, as follows:—The simple question here is whether the defendants are liable to pay penalties for running their cars on Sunday. The answer is far from simple and involves difficulties in the application of constitutional law not covered by previous authority. I find as facts that the road has always been strictly a local concern with no such connection as would constitute it part of a continuous route or system and that the traffic of the company was in no sense through traffic within the meaning of the Dominion Railway Act, 1906, c. 37, s. 9, so that the road as operated at the time of the alleged offences was not within any of the exceptions expressed in such section of the Dominion Railway Act; wherefore the net result is that the defendant company, though it be an undertaking which has been declared to be for the public benefit of Canada, is yet by virtue of the Canada Railway Act, and the proclamation of December, 1906, subject to section 193 of the Ontario Railway Act, which prohibits the operation of electric railway cars on Sunday. The Parliament of Canada by the agency of the Governor General in Council undertakes to confirm any act of the Ontario Legislature within the legislative authority of the province, etc. In the present case the Parliament of Canada has ratified and confirmed sec. 193 of the Ontario Railway Act and made it as valid and effectual as if it had been enacted by the Parliament of Canada. This law is not, therefore, a general law, extending to the public at large, and all classes and conditions of men, but to a corporate body over which the local legislature has inherently or by delegation from the Dominion legislation plenary power as to its control, governance and operation. The late decision of the Supreme Court on Sunday law is not in point for the present case. It is distinguishable both because it purports to be a general law framed for all persons, and the case did not involve the question of local corporations over which the province has constitutional power and competence. The legislation is not to be regarded as a section of the criminal law of Canada, but as a particular penal law intended for the regulation of local electric railways within the province. So viewed I would uphold the impeached legislation as intravires and would award to the plaintiff the penalties claimed. There should be no exemption as to the day on which the mail was carried. The cars were not run for the purpose of carrying the mail, but the mail was carried as a favor because the cars ran that Sunday. Costs to plaintiff.

It is said that the case will be appealed.

The Berlin and Waterloo Electric Ry has decided to furnish its motormen and conductors with new uniforms, and has increased their pay to the following scale:—For first six months, 16c an hour; second six months, 17c.; second year, 17½c.; third year, 19½c.; fourth year, 20½c.

An Unsuccessful Roadbed Experiment at Moncton N.B.

In The Railway and Marine World for Nov., 1911, reference was made to a departure in roadbed construction adopted by the Moncton Tramways, Electricity and Gas Co., which the engineer believed would eliminate difficulty from frost.

The accompanying illustration shows the method adopted: The street was trenched to a depth of 15 ins. Two

Tracklaying on Moncton Tramways, Electricity and Gas Co.'s Line.

inch creosoted planks were laid in this trench, and 6 x 8 ins. x 8 ft. ties were then placed with 2 ft. centres, on which were spiked the rails, 6 ins. grooved and 2 ins. of concrete poured between ties, i.e., on planking. The track was then filled in with gravel and rails were lined up. The present track was completed in November last. We are advised that this spring it was found that the frost had heaved the track work to a considerable extent, and the presence of the planking made the work of lining up the track more difficult than had the ties been laid directly on the ground.

London and Lake Erie Railway Co's Car Barns.

In connection with the information as to these new barns at St. Thomas, Ont., contained in our last issue, we are advised that the boiler and coal storage room will be under the inspector's office and conductor's room. The floor of the west half of the building will be flush with the rails, and this section will be used only for car storage. The operating pits are located in the east half adjacent to the machine shop, etc. The barn will have accommodation for 16 of the company's 50 ft. cars. The building, as well as the freight house and substation, which are located about 20 ft. to the west, will be heated by steam from one boiler. The whole of the equipment will be thoroughly modern.

S. D. Egan, of Toronto, is reported to have been appointed Superintendent of the municipal street railway of Regina, Sask.

Change of Control of International Traction Co.

With the completion of the purchase of $5,000,000 of the common stock of the International Traction Co. of Buffalo, N.Y., that property becomes one of a group of operating public utility corporations controlled by a central holding organization. The United Gas and Electric Corporation, which has been organized under the laws of Connecticut by Bertron, Griscom and Jenks, of New York, although not securing a majority of the stock of the International Traction Co., has bought half of the common stock, leaving the $5,000,000 of preferred stock outstanding. This ownership of stock, of course, is large enough to dominate the property and to direct its operation in accordance with the general plan followed by the other subsidiary properties of the new holding organization. Among the properties that will be included in the control of the group are, in addition to the International system, a number of lighting and power companies, the Susquehanna Ry. and Light Co., the Elmira Water, Light and Rd. Co., and the Lancaster County Ry. and Light Co., which controls the Conestoga Traction Co. and other properties. The principal lines of urban and interurban railways are owned and operated by the International Ry. Co., which also owns the capital stock of several other small operating companies. The entire capital stock of the International Ry. is owned by the International Traction Co. About one-half of the common stock of the International Traction Co. has been owned heretofore by the Tractional Company, a New Jersey holding company. It is this stock which is understood now to have been acquired by the United Gas and Electric Corporation.

The International Traction Co. controls the Niagara Falls Park and River Ry. between Queenston, Niagara Falls and Chippewa, Ont.

Rumored Sale of Dominion Power and Transmission Company.

It was stated in Hamilton, Ont., June 25, that the Mackenzie, Mann and Co. interests had secured control of the Dominion Power and Transmission Co., which, in addition to controlling the Cataract Power Co., which generates electric power at De Cew Falls, near St. Catharines, and transmits it to Hamilton, etc., also controls the Cataract Power Co.'s various subsidiary companies and other companies generating and transmitting electric energy and operating electric railways, including the Hamilton St. Ry., the Hamilton Radial Ry., the Hamilton and Dundas Ry., the Hamilton, Grimsby and Beamsville Ry. and the Hamilton and Brantford Ry.

The President of the Dominion P. and T. Co., J. R. Moodie, according to press reports, admitted that negotiations were in progress and said that a directors' meeting would be held June 26.

The Dominion P. and T. Co. has the following capitalization:—Bonds, $6,488,000 preference stock, $3,673,100; limited preference stock, $5,100,000; common stock, $2,608,000.

Installation of Manually Operated Signal System.

The Indianapolis and Cincinnati Traction Co. has just put into service a manually operated, remotely controlled interlocking signal system designed by P. J. Simmen and installed by Northey-Plummer, Ltd., Toronto, Ont., and Indianapolis, Ind. This system affords means by which the dispatcher as a train approaches, passes or leaves a siding can display stop or proceed signals to the motorman. These signals are displayed by red and green lamps inside the cab, placed directly in the motorman's view. The signal-transmitting apparatus is interlocked so that it is mechanically and electrically impossible for the dispatcher to give signals corresponding to a lap order. Another strong feature of this system is that a permanent graphic record is continually being made in front of the dispatcher, showing at all times the position and direction of movement of all trains. This system of signalling has been in satisfactory operation for some time past on the Toronto and York Radial Ry.'s Mimico Division between Toronto and Port Credit, and has given excellent results.

The Indianapolis and Cincinnati Traction Co. installation includes protection for nine blocks and ten sidings, each block extending from siding to siding and averaging about two miles in length.

Electric Railway Finance, Meetings, Etc.

British Columbia Electric Ry.—Gross earnings for April, $476,058; operating expenses, $302,135; net operating earnings, $173,923; renewal funds, $37,935; net earnings, $135,988; approximate income from investments, $25,000; net income, $160,988, against $368,233 gross earnings; $243,097 operating expenses; $125,136 net operating earnings; $29,770 renewal funds; $95,366 net earnings; $20,000 approximate income from investments; $115,366 net income for April, 1911. Aggregate gross earnings for ten months ended Apr. 30, $4,759,517; net earnings, $1,671,408, against $3,440,733 aggregate gross earnings; $1,336,479 net earnings for same period 1910-11.

Calgary Municipal Ry. — Passenger earnings for May, $48,467.86; miscellaneous earnings, $636.60; total earnings, $49,104.46; operating expenses, maintenance, etc., $26,250.91; net earnings, $22,853.55; contingent account, 5% gross receipts, $2,455.22; interest and sinking fund, $5,263.33; net profits, $15,135, against $28,293.40 passenger earnings; $438.25 miscellaneous earnings; $28,731.65 total earnings; $13,568.35 operating expenses, maintenance, etc.; $1,436.58 contingent account; $2,715.88 interest and sinking fund; $11,010.84 net profit for May, 1911. The revenue per car mile for May was 31.403c; operating expenses per car mile. 16.787c; gross surplus per car mile. 14.616c; cost of power per car mile, 4.651c.

Cape Breton Electric Co.—Gross earnings for April, $26,558.86; operating expenses and taxes, $16,064; net earnings, $10,494.86; interest charges, $4,495.83; balance, $5,999.03; sinking and improvement funds, $1,206.67; balance for reserves, etc., $4,792.36, against $23,331.50 gross earnings; $12,810.47 operating expenses and taxes; $10,521.03 net earnings; $4,512.50 interest charges; $6,008.53 balance; $1.141.67 sinking and improvement funds: $4.866.86 balance for reserves, etc., for April, 1911. The construction charges during April were $4.528.06.

Grand Valley Ry.—The Trust and Guarantee Co., Toronto, are in charge of the affairs of this company, and its allied company, the Brantford St. Ry., and certain legal proceedings have been taken to secure the interests of bondholders. The National Trust Co., Toronto, is seeking to secure a sale of the Brantford St. Ry. in order to settle with the Canadian General Electric Co., which holds $140,000, the original bonded indebtedness of the company. Nothing has been said of the position of tse Woodstock, Thames Valley and Ingersoll Electric Ry., which is owned by the same interests.

Halifax Electric Tramway.—The regular quarterly dividend of 2% will be paid on and after July 1, to shareholders of record at the close of business June 19.

Receipts for March, $17,995.42; April, $17,585.96; May, $18,678.30, against $16,129.49 for March, $17,285.67 for April, and $17,158.82 for May, 1911.

London St. Ry.—Gross earnings for May, $24,620.46; expenses, $18,371.45; net earnings, $6,249.01; deductions, $2,450; net income, $3,799.01. Aggregate gross earnings for five months ended May 31, $116,053.02; expenses, $83,749.70; net earnings, $32,303.23; deductions, $11,997.25; net income, $20,305.98.

Nelson St. Ry.—The city council of Nelson, B.C., decided, June 3, to acquire the street railway from the present company, buying out the shareholders in 20 years. It was reported by the City Auditor that the company was $16,000 in debt, and that there was a present loss of $4,000 a year.

Toronto Ry., Toronto and York Radial Ry., Toronto Power Co., Etc.—Gross earnings for April, $658,174; operating expenses, $296,286; net earnings, $361,888, against $576,685 gross earnings; $293,080 operating expenses; $283,695 net earnings for April, 1911. Aggregate gross earnings for four months ended Apr. 30, $2,622,723; net earnings, $1,345,987, against $2,311,821 aggregate gross earnings; $1,153,462 net earnings for same period, 1911. The traffic receipts of the Toronto Ry. for May were $446,371, against $406,884.92 for May, 1911. The company has forwarded a cheque to the city for $89,724.20, as its percentage of the receipts for May, the amount for May, 1911, being $81,376.99.

Winnipeg Electric Ry.—Gross earnings for April, $292,037; operating expenses, $152,938; net earnings, $139,099, against $308,113 gross earnings; $148,096 operating expenses; $160,017 net earnings for April, 1911. Aggregate gross earnings for four months ended Apr. 30, $1,209,577; net earnings, $554,437, against $1,280,472 aggregate gross earnings; $615.367 net earnings for same period 1911.

With reference to the negotiations for the sale of the property to a New York syndicate, as noted in our last issue, it was rumored in Winnipeg, during June, that the sale to the syndicate, of which E. B. Reese is the head, has been concluded, but no confirmation has been made. It is stated that the decision of the city in agreeing to come under the jurisdiction of the Public Utility Commission, so far as its light and power plant is concerned, has cleared the air considerably. The rumor also declares that the syndicate had a $500,000 option on the property before the company commenced negotiations with the city some time ago, and that the price paid is in the neighborhood of $25,000,000.

Electric Railway Notes.

W. T. Woodroofe, who was formerly in the British Columbia Electric Ry. service, has been appointed Superintendent of the municipal street railway at Edmonton, Alta.

The Grand Valley Ry. has not been running its cars into Galt, Ont., for some months, and the Galt city council is considering the advisability of cancelling the franchise.

The Calgary, Alta., city council has under consideration a proposition for the abolition of transfers and the reduction of fares to 2½ cents, on its municipal electric railway.

The Port Arthur, Ont., city council, at a meeting, June 5, authorized the street railway commissioner to call for

tenders for two pay-as-you-enter cars, for delivery as soon as possible.

The Niagara, St. Catharines and Toronto Ry. is building an electric locomotive, with a weight of 33 tons, 36 ft. long over platform, with steel under framing and steel cab. The cab is to be 29 ft. long over all, length of operating room in cab 9 ft., height of cab, 10 ft., equipped with four Westinghouse 119 motors, Westinghouse straight and automatic air brakes for train control. The locomotive is of the electrical control type, 161 contactors and C-74-A master controller. The new locomotive is to be practically a duplicate of the last one, which was built at St. Catharines last year, this making six locomotives in use on the line.

The following companies have been notified that they will be struck off the British Columbia Companies register, unless they show cause to the contrary, for failure to comply with the regulations required by the act:—Vancouver Street Ry.; Vancouver Electric Ry. and Light Co.; Vancouver and Lulu Island Electrical Ry. and Improvement Co., incorporated under the Imperial Companies Acts, 1862-69; National Electric Tramway and Lighting Co.; Chilliwack Tramway Co.; Vancouver and Westminster Electric Tramway and Light Co.; Nelson Electric Tramway Co.; Canadian Territories Railways Syndicate, incorporated under the Companies Act, 1890.

In the case of Wood vs. The Grand Valley Ry. and A. J. Pattison, at Toronto, June 7, the plaintiff was awarded $10,000 damages and costs for breach of contract by the defendants, in not building an extension of the railway to connect the village of St. George with the C.P.R. at Galt, Ont. The plaintiff also claimed repayment of $10,000 for bonds of the company, and other relief. Justice Middleton, in delivering judgment, said:—"I find on both document and oral evidence that both defendants are liable. The promise for the construction of the road has not been performed, and the only remedy is damages for its breach. If the award is paid, the bonds are to be assigned to the party paying, and any money received by plaintiff on account of the bonds in the meantime, is to be credited on the judgment."

Electric Railway Projects, Construction, Betterments, Etc.

Brandon, Man.—The city council decided, May 22, to take over the project for the building of an electric railway in the city, J. D. McGregor consenting to relinquish the franchise which the council had agreed to give him. The feeling of the ratepayers against the proposed franchise, and the question of the company's position under the Public Utilities Act, were the principal factors in bringing this arrangement about. The council proposes to ask the ratepayers to approve of the raising of $300,000 for the construction and equipment of the line as a public utility. The City Engineer was instructed to order 100 tons of 70 lb. steel rails and 500 tons of 60 lb. steel rails. The council started work in 1912, grading and preparing the road bed on certain streets in connection with the franchise proposed to be given Mr. McGregor. This work is being continued, and it is hoped to have several miles of line in operation this year.

The bylaw authorizing the expenditure of $300,000 upon the building of an electric railway in the city as a municipal undertaking was passed June 14. (June, pg. 308.)

British Columbia Electric Ry.—The question of the company's franchises in the various municipalities which are included in what is called Greater Vancouver, continues to be the subject of considerable discussion between the municipalities, the company and the Provincial Government.

Tracklaying has been completed on the Millside extension, and it was expected to have the line in operation by June 30. It has been arranged to build a second track on the Eberne line, and application has been made to the Board of Railway Commissioners for the approval of plans for the work. Rapid progress is being made on the Highland Park cutoff.

The company is building a line from Port Moody to the Coquitlam dam, upon which it is proposed to use light steam engines. The line will only be used for freight.

A contract has recently been let to C. C. Moore and Co., Seattle, Wash., for the building of a steam auxiliary power plant on Saanich Inlet, Vancouver Island.

The equipment, in addition to a complete steam generating plant, will consist of two Allis-Chalmers turbo-generators, each having a capacity of 2,000 kilowatts, the entire production giving the plant an output equivalent to 6,000 h.p. The B.C.E.R. Co had already purchased five steam turbo-alternators aggregating over 18,000 from Allis-Chalmers-Bullock, Ltd.

One of the features of the new plant will be the construction of the huge stack, which will be of reinforced concrete and will be 248 ft. high. Its inside diameter at the top will be 11 ft., while the inside diameter at the base will be 18½ ft.

The addition of this plant to the working plants, and the others under construction, will bring the total supply of electrical energy controlled by the company up to 128,000 h.p.

At the Jordan River power plant, the original plans have been extended to make the proposition more ambitious, and the ultimate possibilities of the plant have been placed at 36,000 h.p., instead of 24,000, which was first taken to be the maximum of production. The industrial plans also include the development of power on the Lillooet River and the development of hydro-electric projects at Jones and Chilliwack Lakes, which will advance the total output of electrical energy to over 200,000 h.p.

Galt, Preston and Hespeler St. Ry.—We are officially advised that an extension of the line is under construction to the factory district on the west side of the river in Galt, Ont. (May, pg. 257.)

Halifax Electric Tramway Co.—We are officially advised besides building a second track on the loop line mentioned in our April issue, pg. 196, the company is going to extend its Gottingen St. line about a mile to Yong St., provided the city widens Cunard St. The company is now about two weeks ahead of its schedule on the second track work, and is waiting on the city to complete the work in other places. In connection with the power equipment, orders have been given for a General Electric Co., 1,500 k.w. turbo generator with 33% over load capacity, this equalling a 2,000 k.w. turbo generator; a Worthington surface condensing outfit, and a 25 k.w. turbine exciter set. This contract calls for a complete installation, also one spare arc board panel for 2.100 lamp circuit and one spare a.c. fender panel.

The construction programme for 1913 is also under consideration. It is proposed to extend the track from Quinpool Road and Oxford St. to the head of the northwest arm, 15 miles. (June, pg. 308.)

Lake Erie and Northern Ry.—J. Muir, President, made the announcement in Brantford, Ont., recently, that $1,000,000 of the company's bonds had been placed, subject to the subscription locally of $500,000 of debenture stock. Of this $275,000 had been subscribed by H. Cockshutt, J. Marr, L. Harris, J. Sanderson and R. Thompson, and it was proposed to ask the municipalities to subscribe for the balance in the following proportions:—Brantford, $125,000; Paris, Galt, Simcoe, and Port Dover, $25,000 each. The men named above, with W. P. Kellett, are directors of the company. The taxpayers of Brantford voted, June 25, on a bylaw to borrow the sum necessary to purchase the debenture stock at 90, the price at which it has been offered. The councils of the other towns have the matter of subscribing for the stock under consideration.

A meeting of shareholders to complete organization and to authorize the issue of first mortgage and other securities has been called to be held in Brantford July 9.

The Board of Railway Commissioners has approved location plans for the line from the Grand River to Colborne St., Brantford. (May, pg. 251.)

London and Lake Erie Ry and Transportation Co.—In connection with the proposal to build a line from St. Thomas to Port Burwell, via Aylmer, the city of St. Thomas and the municipalities of Yarmouth and Malahide have agreed, provided Aylmer joins them, in guaranteeing the company's bonds for $15,000 a mile, an amount which the London and Lake Erie Ry. and Transportation Co. will accept. At present Aylmer has offered to guarantee its share of the bonds up to $10,000 a mile. (June, pg. 309.)

Levis County Ry.—Press reports state that the company is preparing to award contracts to build an extension of 1.5 miles from the present terminus of its St. Romauld line to the site of the bridge under construction over the St. Lawrence. A. K. McCarthy, Levis, Que., is manager.

We were officially advised, June 14, that the extension from the present terminus of the St. Romnald line will be for 1.5 miles, to Garneau's bridge. and that the work was expected to be started at once.

London, Aylmer and North Shore Ry.—The city of London, which owns the London and Port Stanley Ry., has made a suggestion that it would be willing to guarantee the bonds of a company to build a line from London to Port Burwell, via Aylmer, to the amount of $100,000; to grant running rights over the L. and P.S. Ry., and to provide terminal facilities at the Michigan Central Rd. station in London. The lease of the station by the M.C.R. expires in 1914. It is stated that application will be made for a new charter, and to abandon any efforts to revive the L. A. and N.S. Ry. charter. (June, pg. 309.)

London St. Ry.—Considerable improvements are being made on the lines in London, Ont. Arrangements are being made for the building of second tracks, and the question of the north end extension and that of bricking certain crossings, are being considered. (June, pg. 309.)

Moncton Tramways, Electricity and Gas Co.—We are officially advised that the company is laying a 300 ft. extension to the new I.R.C. shops at Moncton, N.B. No decision has been reached as to other extensions in the city or suburbs.

Moncton Tramways, Electricity and Gas Co.—E. B. Reeson, Vice President, is quoted as stating, June 6, that an early start will be made on projected extensions of the street railway. (June, pg. 309.)

Montreal and Southern Counties Ry.—Considerable progress has been made with the electrification on the line to Chambly, and on the other works which the company is carrying out in St. Lambert, Que. Granby taxpayers on June 15 carried a bylaw granting a 25 year fran-

chise for a line in that city. It is said that the surveys for the Granby St. Cesaire line will be started at once. (June, pg. 309.)

Moose Jaw Electric Ry.—We are officially advised that the land acquired by the company for park purposes is situated about 2.5 miles from the post office in Moose Jaw, Sask. A line is to be built from the corner of Coteau St and Sixth Ave,, South Hill, west along Coteau St. to Third Ave., then south, crossing the river and to the park on the southern boundary of sec. 39. It is expected that the development and construction work will be started in the near future. A. H. Dion is manager. (June, pg. 309.)

Nanaimo, B.C.—A resolution was adopted by the Nanaimo, B.C., city council, May 22, granting the right to M. Yates to build an electric railway on the city streets, upon terms to be agreed upon. A vote of the taxpayers will be taken at an early date, and application will be made next session of the Legislature for the incorporation of a company to build the line. (Mar., pg. 148.)

Niagara, St. Catharines and Toronto Ry.—Work was started June 11 on the company's new station and freight sheds at Port Dalhousie, Ont. J. T. Rebstock, President, Welland board of trade, is quoted as stating June 10, that he had been informed by D. B. Hanna, President, N., St. C. and T. Ry., that all financial arrangements had been completed for extending the railway from Port Colborne to Fort Erie, and that the only obstacle in the way of work being started at once was the opposition of certain residents along the route.

Enquiry of the management shows that Mr. Rebstock was either misreported or that he misunderstood what he was told in the interview referred to. It is not considered likely that the extension will be gone on with this year. (June, pg. 309.)

Niagara, Welland and Lake Erie Ry.—We are officially advised that further construction on this line cannot be proceeded with until the plans have been approved by the Board of Railway Commissioners. (June, pg. 309.)

Ottawa and St. Lawrence Ry.—J. A. Morden and Co., Toronto, advise that they have acquired the charter and all assets of the O. and St. L. Ry. and of the North Lanark Ry. They say that the company is being reorganized, but that officers have not yet been appointed; also that surveys have been completed from Ottawa to Arnprior and from Arnprior to Perth, Ont. Negotiations are said to be in progress for financing construction. No contracts have been let. (May, pg. 252.)

Port Arthur and Fort William Electric Ry.—Bylaws have been passed by the taxpayers of Port Arthur, Ont., to provide funds for the purchase of steel rails for Cumberland St. and Fort William road, and to provide iron poles for use on the line. Plans are under consideration for the building of a belt line which will serve the outlying points of the city. (June, pg. 310.)

St. Thomas St. Ry.—The city council of St. Thomas, Ont., has accepted the tender of the Michigan Central Rd for 60 lb. rails at $26.50 per ton, for the street railway. (June, pg. 310.)

Saskatoon Electric Ry. and Power Co.—The taxpayers voted June 18 on a bylaw authorizing the Saskatoon, Sask., city council to raise $500,000 on debentures for the construction and equipment of a municipal street railway. (June, pg. 310.)

Stratford St. Ry.—At a special meeting of the Stratford, Ont., city council, May 29, the bylaw granting a franchise to the company was finally settled. The bylaw provides that the company shall obtain its power from the Hydro-Electric Commission of Ontario, provided that the rates charged by the commission are not greater than can be obtained from other corporations guaranteeing power, or by other means. The city authorities undertake to secure legislative sanction to the amendments made in the bylaw of 1910. It is said that construction will be started at an early date, and that surveys will be made at once for an extension of the line to Grand Bend on Lake Huron. The charter is controlled by Mackenzie, Mann and Co., and J. E. Rothery, Toronto, is in charge of the project. (June, pg. 310.)

Toronto.—The city council passed a resolution, May 28, authorizing the corporation counsel to appoint a permanent railway expert as an official to be attached to his department for street railway traffic purposes, and appropriating $35,000 for the securing of expert assistance required in connection with transportation matters. This was the recommendation of the board of control, but in passing the council an amendment was added as follows:—"Such expert or experts to be residents of Canada if such can be found satisfactory to the corporation counsel." B. J. Arnold, Chicago, Ill., and J. W. Moyes, Toronto, have been engaged for the purpose. (April, pg. 198.)

Toronto Eastern Ry.—The Board of Railway Commissioners has approved location plans for this projected line through the townships of Whitby and Whitby East. A contract has been let to Ewen Mackenzie, Toronto, for the building of the line from Bowmanville to Toronto, or to some point near Toronto. The route of the line into Toronto has not yet been announced, but it is probable that at first, at least, it will connect with the Canadian Northern Ontario Ry. line outside Toronto. (June, pg. 310.)

Toronto and York Radial Ry.—Surveys are reported to have been made for a line to connect the Scarboro and Metropolitan divisions with the Canadian Northern Ontario Ry. in the Don Valley near where the Toronto Eastern Ry. will connect. This will enable a connection to be made round north Toronto with the Toronto Suburban Ry. in the north west end of the city, which line is owned by the same interests.

The Ontario Railway and Municipal Board, June 17, made an order authorizing the Metropolitan Ry., one of the component companies, to deviate its line from Yonge St. to a private right of way from Farnham Ave. to a new terminal 800 ft. west, and north of the C.P.R. The line will cross several streets on the level, but the speed is not to exceed six miles an hour, the Board holding that it was not reasonable to compel the line, with its small earnings, to spend $500,000 in grade separation, more especially as the municipalities refused to contribute anything. Very strong objection has developed in Toronto to the Board's order and steps are being taken to upset it. (Mar., pg. 149.)

Toronto Suburban Ry.—Application is being made for permission to build a second track on certain of the lines in West Toronto, and to alter the gauge in others to standard. Construction of the line from Weston to Woodbridge, Ont., is being proceeded with, but nothing had been done to June 18 on the line from Lambton west. Purchasing agents are negotiating for right of way between Islington and Meadowvale. (June, pg. 310.)

Windsor, Essex and Lake Shore Rapid Ry.—Location plans have been approved by the Board of Railway Commissioners for a new siding, freight shed and station at Essex, Ont. (Dec., 1911, pg. 1173.)

Among the Express Companies.

The Canadian Ex. Co. has extended its service on the G.T. Pacific Ry. to Mirton, 56 miles west of Edson, Alta. New offices will be established at Bickerdike and Makanum.

The Pacific Parcels Delivery and Express Co., and the White Pass and Yukon Express Co., have been notified that they will be struck off the B.C. Companies register unless cause be shown to the contrary, for failing to comply with the regulations as required by the act.

The Dominion Express Co.'s annual meeting was held at Montreal, June 14, when the report for the past year was presented and the usual dividends declared. The directors for the current year are—President, W. S. Stout; Vice President, R. Paton McLea: Sir Thos. G. Shaughnessy, R. B. Angus, C. R. Hosmer.

The Canadian Northern Ex. Co. commences operating over the Bay of Quinte Ry., July 1, superseding the Dominion Ex. Co. Following is a list of the offices on the line:—Actinolite, Allens, Bannockburn, Camden East, Deseronto, Enterprise, Erinsville, Larkins, Marlbank, Moscow, Napanee, Newburgh, Queensboro, Strathcona, Sydenham, Stoco, Tamworth and Yarker, Ont.

The American Ex. Co., which has been operating over the Quebec Central Ry. for the past 15 years, withdrew from the service, June 30, and closed its offices on the line between Quebec and Sherbrooke. The company retains an office at Montreal. The control of the Quebec Central Ry. having passed into the hands of the C.P.R., the Dominion Ex. Co. will in future operate over the line.

The Dominion Ex. Co. advised that it withdrew its service from the Bay of Quinte Ry., June 30, being superseded by the Canadian Northern Ex. Co., the Bay of Quinte Ry. having passed under the control of the C.N.R. Hereafter shipments by Dominion Ex. Co. will be waybilled to destination through Tweed, Ont., and business from its offices on the Kingston and Pembroke Ry. south of Sharbot Lake will be routed through Harrowsmith, Ont.

The Dominion Ex. Co. advises that on account of the Canadian Northern Ex. Co.'s service not having yet been put into operation over the C.N.R., west of Hawkesbury to and including Ottawa, also west of Port Arthur to North Lake, Ont., shipments for Addie Lake, Cumberland, Cyrville, Evanturel, Gravel Lake, Hiawatha Park, Hymers, Jessop Falls, La Framboise, L'Orignal, Nilalu, Clarence, Orleans, Rideau Jct., Rock Lake, Rockland, Sandstone, Silver Creek, Silver Mountain, Slate River, Stanley Jct., Treadwell, Wall Bridge, Wendover, Whitefish and North Lake, must not be accepted until further advised.

The Dominion Ex. Co. calls the attention of its agents to conditions of carriage 10 of Express Classification 2, covering carriage by two or more companies, providing that unless otherwise specifically stated, where a shipment cannot be carried through to destination by one company and is necessarily carried by two or more companies, each company's charge will be assessed separately and not on the through rate made by combining the locals, except that when the shipment comes within the table of graduated charges, one through charge shall be assessed thereon, as in Condition of Carriage 9. For example, when the local merchandise rates are $1 and $2, the scale N rate through is $2.30, that is, the sum of the local scale N rates, not $2.10 based on the combined merchandise rate of $3. This does not apply when a specific minimum charge or a joint through rate is in effect.

Marine Department

The Richelieu and Ontario Navigation Co. Absorbs Three More Steamboat Lines.

Following on its acquisition last year of the Northern Navigation Co., the Richelieu and Ontario Navigation Co. has recently made considerable further progress with its scheme for the absorption of lake vessel lines, by adding the Niagara Navigation Co., the St. Lawrence River Steamboat Co. and the Thousand Island Steamboat Co.

The whole of the Niagara Navigation Co.'s issued stock, $998,600, out of an authorized issue of $1,000,000, there being 14 shares in the treasury, was secured before the end of May, all the shareholders having transferred their holdings. A very large majority of them took payment in cash at $200 a share, the balance taking R. and O.N. stock in exchange at 120, that is five R. and O.N. shares for three Niagara shares. In addition to this the Niagara shareholders received a bonus of $13.72 for each share held, this being the advance in value of 1981 shares of stock which were taken over some months ago from J. C. Eaton of Toronto, and which he received in part payment for the Hamilton Steamboat Co. and the Turbine Steamship Co.'s properties. In other words, the sale to the R. and O.N. Co. netted the Niagara shareholders $213.72 per $100 share. The Niagara Navigation Co. had 4½% debentures outstanding for $227,000, thus bringing the total purchase price up to $2,224,200.

The transfer of stock having been effected, the directors of the Niagara Navigation Co., headed by Sir Edmund Osler, retired early in June, the following being elected to succeed them:—Sir Rodolphe Forget, President; W. Wainwright, Vice President; C. J. Smith, Vice President and General Manager; Sir Henry M. Pellatt, W. Manson, G. Caverhill and A. H. Sims. F. Percy Smith, Secretary, R. and O.N. Co., was also appointed Secretary of the Niagara Navigation Co., vice J. M. Sullivan, who has been appointed Assistant Secretary.

B. W. Folger, who has been General Manager of the Niagara Navigation Co. for a number of years, since the retirement of the late John Foy from that position to take the presidency, resigned at the same time as the old board. He has not decided on his future activities, but will probably remain in Toronto for this summer at least.

The St. Lawrence River Steamboat Co. and the Thousand Island Steamboat Co. with headquarters at Kingston, Ont., and Clayton, N.Y., respectively, were owned by a syndicate headed by Sir Edmund Osler, W. D. Matthews and B. W. Folger of Toronto, Robt. Crawford of Kingston being President. The St. Lawrence River Steamboat Co. has a capitalization of $60,000 and the Thousand Islands Steamboat Co. of $100,000, in addition to which there is certain bonded indebtedness. The prices paid by the R. and O.N. Co. for these properties have not been made public, but it is generally believed that the syndicate above mentioned, which obtained control a little over a year ago, made a good profit on the sale. The stock of both companies having been purchased by the R. and O.N. Co., Mr. Crawford and his co-directors retired June 11 and the following were elected:

St. Lawrence River Steamboat Co.—President, Sir Rodolphe Forget; Vice President, W. Wainright; Vice President and General Manager, C. J. Smith; other directors, F. P. Smith, J. V. O'Donahoe.

Thousand Island Steamboat Co.—President, Sir Rodolphe Forget, Vice President, C. J. Smith; other directors, W. Wainwright, A. H. Sims, Montreal; B. L. Jones, H. Parry, Buffalo, N.Y.; F. K. Force, Watertown, N.Y.

F. Percy Smith, Secretary, R. and O.N. Co., was appointed Secretary of both these acquired companies.

At Dec. 31, 1911, the R. and O.N. Co. had capital stock issued for $5,311,875 and 5% bonds for $1,233,633.33 outstanding. On May 28 notice was given of the issue of new stock for $1,908,500, which was offered to shareholders at par, one share of new for each four shares of old held.

The following appointments, etc., have been announced:—

C. J. Smith, as Vice President and General Manager, will have full charge of the properties of the Niagara Navigation Co., the St. Lawrence River Steamboat Co. and the Thousand Island Steamboat Co.

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General Manager, Richelieu and Ontario Navigation Co.

H. Foster Chaffee, heretofore Assistant General Passenger Agent, R. and O.N. Co., Toronto, has been appointed General Passenger Agent, R. and O.N. Co. lines west of Prescott, Ont., including Niagara Navigation Co., Thousand Island Steamboat Co., and St. Lawrence River Steamboat Co. Office, Toronto.

The jurisdiction of the following R. and O.N. Co.'s officials has been extended over the Niagara Navigation Co.:—T. Henry, Traffic Manager; H. Foster Chaffee, General Passenger Agent Western Lines; J. Ritchie, General Agent; J. A. Villeneuve, Comptroller and Treasurer; M. Cussen, Auditor Freight and Passenger Receipts; J. V. O'Donahoe, Manager's Assistant; G. Johnston, Mechanical Superintendent; A. Angstrom, Naval Architect; J. Phelan, Assistant to Mechanical Superintendent; A. A. Barry, Chief Culinary Steward; J H. Bouchard, Chief Equipment Steward. The jurisdiction of all these officers except J. Ritchie, has also been extended over the St. Lawrence River Steamboat Co. and Thousand Island Steamboat Co.

Jas. Ritchie, heretofore General Agent, R. and O.N. Co., Toronto, as General Agent representing the General Manager's office, has been given general supervision of the Toronto, Hamilton, Lewiston, Youngstown and Niagara terminals, and the operation of the steamboats and handling of traffic in connection therewith. Officers, agents, captains, engineers, pursers, stewards and employes of the mechanical department report to his office in connection with operation, maintenance, repairs and supplies.

J. V. Foy, heretofore General Passenger Agent, Niagara Navigation Co., has been appointed District Passenger Agent, R. and O.N. Co. Office, Toronto.

R. H. McBride, heretofore Treasurer, Niagara Navigation Co., has been appointed Assistant Treasurer, N.N. Co.

S. J. Murphy, heretofore Travelling Passenger Agent, Niagara Navigation Co., has been appointed Excursion Agent, Niagara Navigation Co. Office, Toronto.

J. A. Goodearle, General Freight Agent, and J. P. McConnell, Assistant Freight Agent, Niagara Navigation Co., Toronto, and W. E. Bishop, General Agent, Niagara Navigation Co., Hamilton, Ont., remain in the same positions.

H. D. Patterson, heretofore Travelling Passenger Agent, R. and O.N. Co., Toronto, has been appointed Travelling Passenger Agent lines west of Prescott, including affiliated lines.

G. Price, ticket agent, R. and O.N. Co., 46 Yonge St., Toronto, has also been appointed ticket agent for the Niagara Navigation Co., and other affiliated lines.

H. E. Weller, heretofore ticket agent, Niagara Navigation Co., 63 Yonge St., Toronto, has been appointed terminal ticket agent, R. and O.N. Co., at the Yonge St. wharf, Toronto. The business heretofore transacted at 63 Yonge St. has been removed to 46 Yonge St.

W. F. Cloney, District Passenger Agent, R. and O.N. Co., Buffalo, N.Y., has also been given jurisdiction over the Niagara Navigation Co.'s line.

The jurisdiction of T. Henry, Traffic Manager, R and O.N. Co., has been extended over Thousand Island Steamboat Co. and St. Lawrence River Steamboat Co.

H. B. Mills, heretofore General Passenger Agent, St. Lawrence River Steamboat Co. and Thousand Island Steamboat Co. at Kingston, Ont., has been appointed General Agent at Clayton, N.Y.

G. Bowden, heretofore Secretary Treasurer, St. Lawrence River Steamboat Co. and Thousand Island Steamboat Co., has been appointed Assistant Secretary Treasurer of those companies.

J. W. Canvin, District Passenger Agent, R. and O.N. Co., Alexandria Bay, N.Y., has had his jurisdiction extended over the St. Lawrence River Steamboat Co., and the Thousand Island Steamboat Co.

The Niagara Navigation Co.'s general offices in the Traders Bank Building, Toronto, will be retained by the R. and O.N. Co.

With the exception of its ferryboat

Ongiara on the Niagara River, the Niagara Navigation Co. has not operated on Sunday, but the R. and O.N. Co. intends to run its Niagara River Line on that day, commencing July 7. The official notice say "that as a matter of public necessity and in order to provide through service for the travelling public it will establish a Sunday service to and from Toronto connecting with other transportation companies, leaving Toronto at 7.30 and 11 a.m., 2 and 5.15 p.m., conecting with New York Central Lines and Niagara Gorge Rd. for Buffalo, and at Buffalo with all rail and water lines. From Lewiston, N.Y., steamboats will leave at 8 and 10.30 a.m., and 2 and 6 p.m., making through rail and water connections at Toronto."

The R. and O.N. boats on the Prescott-Toronto run have heretofore arrived at and departed from Toronto on Sundays, so that the change above mentioned will merely be an extension of the service through to Lewiston, N.Y. The boats will not call at Niagara-on-the-Lake or Queenston, Ont. The line between Toronto and Olcott, N.Y., will also run on Sundays. There will be no Sunday service between Toronto and Hamilton. On the Toronto-Lewiston and Toronto-Olcott routes passengers will be carried at regular rates only, book tickets will not be honored and there will be no excursion rates.

The combined fleet of the R. and O.N. Co. and the companies which it has acquired is now as follows:—

R. and O.N. Co., 13 steamboats and 18 market line steamboats and ferries.

Northern Navigation Co., 9 steamboats.

Niagara Navigation Co. (including acquired from Hamilton Steamboat Co. and Turbine Steamship Co.), 8 steamboats.

St. Lawrence Steamboat Co., 3 steamboats.

Thousand Islands Steamboat Co., 3 steamboats.

This makes a total fleet of 54.

A large passenger steamboat is being built for the Northern Navigation Co. at Port Arthur. The Thousand Islander, the Thousand Island Steamboat Co.'s new boat, was delivered on June 16 and the R. and O.N. Co. announces that it will build a large ferry for service at Montreal. Some months ago it was announced that the Niagara Navigation Co. had decided to build another boat and that plans were being prepared by F. E. Kirby, of Detroit, Mich. Only some preliminary work was done in this connection, the Niagara Co.'s management dropping the matter in consequence of the negotiations for the sale of the company's interest. The R. and O.N. Co. will probably take this up.

Up to June 20, when this was written, the Island Navigation Co. had not been taken over by the R. and O.N. Co., but we were officially advised that the basis on which it was to be taken over had been approved of.

Dominion Government Hydrographic Steamship for Atlantic Coast.

The specification for the building of a single screw steamship for the hydrographic branch naval service department for use in the Atlantic coast service, tenders for which were received up to June 30, call for a vessel of the following principal dimensions:—Length, over all, 177¾ ft.; length, between perpendiculars, 165 ft. beam moulded, 33½ ft.; depth, 13½ ft.; displacement to mean draught of 11 ft., above bottom of keel angles amidships, about 950 tons, with 250 tons of coal on board and 60 tons of stores and water. The vessel and fittings are to conform to all the requirements of the rules and regulations prescribed by the Dominion Board of Steamboat Inspection, and to equal the requirements of British Lloyds to class 100 A 1.

She is to be built of steel throughout except where otherwise specified, with

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Traffic Manager, Richelieu and Ontario Navigation Co.

straight stem, elliptical stern and two pole masts of wood with necessary sails and rigging; one spar deck of steel covered with wood deck to Lloyds' requirements, the forward end being stiffened

P288 H. Foster Chaffee,
General Passenger Agent, Western Lines, Richelieu and Ontario Navigation Co.

from the stem back to the breakwater. The main deck to be plated amidships over the machinery space and bunker, and covered with wood deck; double bottom extending from aft engine room bulkhead to forward bunker bulkhead, and a water tight flat forward and aft of same, there being six water tight bulkheads extending to main deck; nine hatchways in spar deck, on which deck will be located the deck house and pilot house. The equipment is to include a steam winch with all necessary fair leads for handling boats and warping ship, one steam anchor windlass forward for handling anchors and fitted with gypsey heads for warping ship, one sounding winch, and a sounding machine, which will be provided by the department. The steam steering gear is to consist of a two-cylinder, 4 by 5 in. engine of approved make, operated by means of a telemotor located in the pilot house. Two 27 ft. gasoline launches, each fitted with 15 h.p., or 4-cycle engines, two 27-ft. cutters and one 18-ft dinghy are to be supplied. The electric lighting plant is to consist of a generating set of one steam-turbo generator of steam economy equal to that of a compound engine, or a compound engine, to be directly connected to a generator of not less than 13.2 kw., capable of supplying all lights on the vessel, including a search light at the same time at 110 volts pressure.

The propelling machinery to consist of vertical inverted three cylinder triple expansion engines with cylinders 17½, 27½, and 47½ ins. diar., by 28 ins. stroke, driving a three blade propeller 10 ft. diar. 9 ft. pitch, at about 150 revs. per minute, giving a speed of 12 knots an hour, with steam pressure of 185 lbs. The steam will be supplied by two Scotch boilers, each 11½ ft. long by 11¼ ft. mean diar., fitted with corrugated furnaces, with a combined grate surface of 90 sq. ft., and total heating surface of 2,800 sq. ft., and with forced draught equipment. The auxiliary machinery will include, steam dynamo, one independent bilge pump, one fire pump, one auxiliary feed pump, one main feed pump, one sanitary pump and one 10-ton evaporator and a distiller with capacity for 1,600 gallons in each 24 hours.

Reid Newfoundland Co.'s New Steamship for Canadian Service.

As noted in our last issue, the Reid Newfoundland Co. has ordered in Newcastle, Eng., two steamships, one of which will be operated in the daily service between Port aux Basques and North Sydney, N.S., with the company's new steamship Bruce, replacing the s.s. Invermore, and the other being run in the Labrador service. Both vessels are being built to class 100 A1 at Lloyds, with special strengthening for ice.

The first vessel, that for the Port aux Basques-North Sydney service, will have accommodation for 78 first and 160 second class passengers, and will have the following dimensions—Length between perpendiculars, 255 ft.; breadth, 37 ft.; depth, moulded to shade deck, 24¾ ft. She has been designed to carry about 800 tons on a 17¼ ft. mean draught, with a speed of 15 knots an hour. She will be equipped with four boilers, 15 ft. diar., by 11½ ft. long, fitted with forced draught, supplying steam at 180 lbs. pressure. The contract calls for delivery by Jan. 31, 1913.

The vessel for the Labrador service will have accommodation for 68 first, and 140 second class passengers, with extra accommodation for 18 persons in hospital. Her dimensions will be, length between perpendiculars, 220 ft.; breadth. 32 ft.; depth moulded, 20½ ft. She will have a speed of 13 knots an hour, and will be equipped with two boilers 13¾ ft. outside diar., by 11 ft. long, fitted with forced draught. The contract calls for delivery by Apr. 15, 1913.

The Board of Railway Commissioners has defined the express collection and delivery limits for Grand Falls, N.B.

The Dominion Canals Statistics for 1911.

The canal statistics of the year 1911 have been issued by the Railways and Canals Department.

The aggregate volume of freight moved through all the canals was 38,030,353 tons, a decrease of 4,960,255 tons from 1910. This is more than accounted for by the decline in traffic at Sault Ste. Marie, applicable almost wholly to United States ore. An increase of 211,339 tons through the Welland canal, and of 344,956 tons through the St. Lawrence canals, would point to satisfactory growth as far as strictly Canadian business was concerned.

The freight traffic was distributed among the various canals as follows:—

	Tons.	Inc.	Dec.
Sault Ste. Marie	30,951,709	.....	5,443,978
Welland	2,537,629	211,339	.....
St. Lawrence	3,105,708	344,956	.....
Chambly	599,829	.....	69,470
St. Peter's	75,298	.....	10,653
Murray	163,457	.....	14,484
Ottawa	320,071	.....	65,190
Rideau	172,227	37,346	.....
Trent	57,290	11,027	.....
St. Andrew's	47,135	38,852	.....
Total	38,030,353	643,520	5,603,775

The expansion for the ten year period between 1902 and 1911 was equal to 406%, the tonnage in 1902 having been 7,513,197 tons.

The following comparative statement shows on what canals the growth has taken place during the past four years:—

	1908.	1911.
Sault Ste. Marie	12,759,216	30,951,709
Welland	1,703,453	2,537,629
St. Lawrence	2,009,102	3,105,708
Chambly	503,276	599,829
St. Peter's	72,015	75,298
Murray	25,901	163,457
Ottawa	258,527	320,071
Rideau	89,640	172,227
Trent	81,690	57,290
St. Andrew's	.....	47,135

The percentage of traffic in 1911 was as follows:—Vegetable products, 14.2%; animal products, 0.1%; manufactures, 6.2%; produce of forests, 4%; produce of mines, 75.5%.

CANADIAN AND UNITED STATES TRAFFIC.

Prior to 1908 the statistical methods in use did not provide for a separation of Canadian and United States business passing through the canals. Since that date a record has been kept of the country of origin, and the facts with respect to the traffic of all the canals are given in the following statement:—

Year.	Canadian Vessels.		U. S. Vessels.		Freight Tonnage.		
	No.	Tonnage.	No.	Tonnage.	Canadian.	United States.	Total.
1908	29,040	6,780,789	7,149	4,835,320	5,012,147	12,490,673	17,502,820
1909	22,507	7,811,578	9,996	16,459,322	7,378,057	26,342,691	33,720,748
1910	25,337	8,931,790	11,462	21,777,297	7,883,614	35,106,994	42,990,608
1911	25,585	9,172,192	10,370	18,231,622	7,792,907	30,237,446	38,030,353

Of all the commodities transported through Canadian canals in 1911, the proportion originating in the U.S. was 79.5%. In 1910 the proportion was 81.6%. This large difference in favor of the U.S. is almost wholly accounted for in the volume of ore passed through the Sault Ste. Marie canal.

With regard to vessel tonnage, the proportions in 1911 stood as follows:—Canadian, 33.5%; United States, 66.5%.

TRANSPORTATION OF CANADIAN WHEAT.

With the development of the western provinces there has been a steady growth in the volume of waterborne wheat. Since 1895 the quantities annually brought down through the Sault Ste. Marie canal are as follows:—

	Bush.
1895	4,518,334
1896	19,314,234
1897	17,925,834
1898	9,746,600
1899	12,759,634
1900	9,292,034
1901	9,639,534
1902	27,912,500
1903	32,233,934
1904	29,794,100
1905	25,983,100
1906	34,389,300
1907	49,399,967
1908	58,574,034
1909	48,047,833
1910	51,774,833
1911	63,641,000

The figures for the years anterior to 1909 include U.S. wheat. The increase in 1911 over 1909, applicable only to Canadian wheat, was 15,593,167 bush., or 32.4%.

In addition to the 63,641,000 bush. of Canadian wheat which passed through the Canadian canal at Sault Ste. Marie, 1,981,481 bush. of Canadian wheat passed through the U.S. canal there. These figures combined show that the volume of waterborne Canadian wheat in 1911 was 65,622,481 bush. Account is not taken of the relatively small quantity of wheat which was moved through any of the other canals. However, 183,449 barrels of Canadian flour were carried through the Canadian canal at Sault Ste. Marie in 1911, and 841,733 barrels of Canadian flour through the U.S. canal. Calculating this Canadian flour into wheat makes an addition of 4,100,728 bush. to the volume already indicated, bringing the total up to 69,723,209 bush.

Last year, for the first time, a careful study was made of the distribution of Canadian wheat after it had passed through the canal at Sault Ste. Marie, and this year the same analytical methods have been applied to the traffic of 1911. The record is as follows:—

	1909. Bush.	1910. Bush.	1911. Bush.
Fort William to Montreal	10,517,266	13,185,370	12,761,666
Fort William to Georgian bay	13,384,400	12,753,200	9,881,234
Fort William to other Canadian ports	10,149,633	9,603,400	11,880,666
Fort William to Buffalo	12,841,334	15,693,363	27,945,600
Duluth to Montreal	520,000	315,000	.....
Duluth to Buffalo	528,200	224,500	710,334
Duluth to Georgian bay	28,000	.....	461,500
Duluth to other Can. ports	79,000	.....	.....
Total	48,047,833	51,774,833	63,641,000
Through U.S. canal	9,117,328	5,321,446	1,981,481
Grand total	57,165,161	57,096,279	65,622,481

The "other Canadian ports" indicated above are ports west of Lake Erie, but not on the Georgian bay.

It is quite impracticable to follow the course of the small volume of Canadian wheat which passed through the U.S. canal at Sault Ste. Marie. With respect to that which passed through the Canadian canal, however, the figures work out in the following percentages:—

	1909.	1910.	1911.
Fort William to Montreal	21.9	25.5	20.1
Fort William to Georgian bay	27.9	24.6	15.6
Fort William to other Canadian ports	21.1	18.5	18.7
Fort William to Buffalo	26.7	30.3	43.8
Duluth to Canadian ports	1.3	.6	.7
Duluth to American ports	1.1	.5	1.1

In commenting on these figures the Comptroller of Statistics, J. L. Payne, says:—"It will be seen that 54.4% of all the Canadian wheat which came down in 1911 through the Canadian canal at Sault Ste. Marie clung exclusively to Canadian channels. The proportion in 1910 was 68.6%; so that the diversion to U.S. channels was considerably greater in 1911.

"Of the 63,641,000 bush. of Canadian wheat which were transported through the Canadian canal at Sault Ste. Marie during 1911, 43.8% went to Buffalo, N.Y. Wheat is supposed to follow the channel offering the lowest freight rates, other things being equal. In this instance, however, distance and freight rates were substantially in favor of Montreal; and yet other considerations caused nearly half of the wheat which came down last year from the Canadian west to find its outlet to the ocean through Buffalo.

"The course of the wheat trade during Nov., 1911, may be taken as illustrating the situation. In that month 18,021,300 bush. of Canadian wheat were passed through the Canadian canal at Sault Ste. Marie, or nearly one-third of the total volume for the year. The all-water freight rate from Fort William to Montreal in November was 4½c. per bush. The water rate from Fort William to Buffalo was 3½c. per bush., plus 5½c. by rail from Buffalo to New York. Montreal and New York are the essential points of comparison. Thus in November the freight rate from Fort William to Montreal was 4½c., as compared with 9c. to New York. This would seem to establish a controlling advantage in favor of Montreal, and, other things being equal, it would be; yet in that month 48.3% of all the Canadian wheat which came down from the west, including that which passed through the U.S. canal, went out by way of Buffalo-New York.

"Careful inquiries were made as to the conditions which operated in November last, and which in some degree operate in all seasons, as a countervail to the lake freight rates in favor of Montreal. They were ascertained to be: First, availability of ocean tonnage at New York; second, lower ocean rates between New York and foreign ports; and, third, lower ocean insurance rates from New York. These factors were obviously sufficient to divert, in November last, nearly half of all the Canadian wheat from the west into U.S. channels.

"November is the rush month in the wheat trade. Market considerations may, under such circumstances, rise above the immediate question of rates. Delivery at a foreign port within a specified time may depend upon the choice of the dearest available channel, rather than the cheapest, and it is probable that this very situation caused the diversion of millions of bushels from the port of Montreal in 1911. Under such conditions, mere uncertainty as to ocean tonnage may turn the scale.

"Marine insurance rates remained unchanged during the year. In November they ran from 65c. to $1.10 per $100 from Montreal, as compared with 12½ to 15c. from New York.

FREIGHT RATES BY WATER.

"The department has very frequently been asked the question: What are the transportation rates per ton per mile on Canadian canals? It has always been impossible to give an answer. The information upon which to base an accurate calculation, so as to make, for example, a comparison between freight rates by water and freight rates by rail, has never been available. Carriers by water have not at any time been asked to disclose their freight charges. There is no good reason, however, why they should not be. Such carriers enjoy rather extraordinary privileges, and the whole question of transportation rates by land and water is manifestly of deep public interest. Railway corporations are required by law to give an exceedingly analytical statement of their operations, and carriers by water should at

least be asked to give such information as will enable the important question of freight rates to be definitely determined. Acting upon instructions, I propose to inaugurate for 1912 such changes in our statistical methods as will fully and definitely ascertain the freight charges per ton per mile by vessels operating on the inland waters of the Dominion.

"Meanwhile, careful study has been given to the data in hand in order to estimate the rate per ton per mile charged by carriers using the canals. For this purpose three factors are required: First, the number of tons moved; second, the length of the haul in miles; and, third, the freight charges. Not one of them is definitely available at present. It is not known, for example, how many tons were transported through the canals. It is accurately known how many tons passed through each particular canal; but it has been found impracticable under the system which has long been in vogue to prevent some measure of duplication in making up the total. Under the methods to be adopted hereafter the tonnage will be absolutely accurate. The length of the haul in each instance has not been made a matter of record up to this moment. This will be corrected hereafter. The schedules in use have not taken cognizance of freight rates, and that, too, will be taken care of in the plan to be given effect in 1912.

"In this situation, it has been found necessary to select one of the gateways of our inland water system, and apply certain tests to the traffic flowing through it. The Welland canal was chosen. All through business between the lower and upper lakes, moving up or down, must pass that point. Here, then, is the first factor—the volume of traffic. The total number of tons which passed through the Welland canal during 1912 was 2,537,629. Of this aggregate, 842,919 were moved up, or westward; while 1,694,710 were moved down, or eastward. The relative proportions were 34% and 66% respectively. It is assumed that all the business which passed through the Welland canal was moved the whole distance between Montreal and Fort William—1,223 miles—or vice versa. This gives the second factor—the length of the haul.

"In an effort to ascertain the freight charges which prevailed in 1911, it was found that the rate on only one commodity, wheat, was definitely known. That is put down at $1.50 a ton for carriage between Fort William and Montreal. It is probably the lowest rate at which any commodity is carried through the canals. The total volume of wheat transported through the Welland canal in 1911 was 562,282 tons, or a little over 22% of the total volume of traffic. Among the 32 commodities moved, there were 187,411 tons of general merchandise, on which a rate two or three times as high as $1.50 a ton was probably charged. Having regard to the whole list, it is thought fair to assume, for the purposes of this estimate, that an average rate of at least $2 a ton was levied. This is probably a low figure, in view of the fact that the average rate on the Erie canal in the last year for which information was obtainable, was equal to $2.45 a ton for the distance between Fort William and Montreal; and the Erie canal is a barge canal, which provides the cheapest known form of transportation by water. This, then, gives the third factor—the freight charge.

"It will be seen that 2,537,629 tons carried 1,223 miles, would be equal to 3,103,520,267 tons carried one mile. The freight bill on 2,537,629 tons, at $2 a ton, would be $5,075,258. Dividing the ton miles into the freight earnings gives the quotient of 0.163c. a ton per mile. The rail rate from Fort William to Montreal on wheat is $4 a ton, or 0.421c. a mile, so that the water rate is, by comparison, quite low. But in comparing the rail and water rates between these two points, it must be remembered that the railway has to maintain its right-of-way, pay interest on capital invested, and meet all incidental operating expenses. In the case of transportation by water, the Government keeps up the right of way, pays the cost of operating the canals, and makes no charge of any kind to the vessel owner or shipper. The question at once suggested is: What is the contribution of Government toward the reduction of the freight rate by water?

"To answer this question, the first item to be taken into account is interest on capital invested. Without going into details, let it be said that the Government has expended $80,000,000 in constructing the canals between Fort William and Montreal, and in providing otherwise for the navigation of that chain of waterways. In this $80,000,000 is not included the very considerable cost of harbors and lighthouses. It represents practically the direct cost of the canal system by itself. The interest charges on that capital outlay, at 3½%, would amount to $2,800,000 a year. This would be equal to a contribution of 0.090 a ton per mile on account of interest on capital. To this must be added the expenditure for maintenance and operation, which represents an average of $1,400,000 a year. The contribution of Government on that account is equal to 0.045 a ton per mile. The account would thus stand, per ton per mile, as follows:—

Freight charges	0.163c.
Government contribution, interest	0.090c.
Government contribution, maintenance, etc.	0.045c.
Total	0.298c.

"I am quite confident that when all the facts are positively ascertained for 1912, it will be found that the foregoing estimate is quite too low. It is below the results on the Erie canal, and not more than about one-third of the rate per ton per mile charged by European canals. However that may be, it will be observed that the contribution of Government in 1911 was equal to 0.135c. a ton per mile, or 83% of the freight rate charged by vessel owners.

"There is still another important and vital aspect of this matter. Of the 2,537,629 tons of freight which passed through the Welland Canal in 1911, only 1,296,480 tons, or 51% of the whole, consisted of Canadian products. The remaining 49% was composed of U.S. commodities, most of which passed from a U.S. port to a U.S. port. This would not in any way affect the freight rate; but it may be worth while to show what was the contribution of Government toward the transportation of exclusively Canadian business through the canals between Fort William and Montreal in 1911. The number of tons carried one mile in that case would be 1,585,595,040. Without going into the details of the calculation, as was done in a preceding paragraph, let it be said that on Canadian traffic only the account per ton per mile would stand as follows:—

Freight charges	.163c
Government contribution, interest	.177c.
Government contribution, maintenance, etc.	.088c.
Total	.428c.

"It will be seen that the Government contribution amounted to 0.265c. a ton per mile, as compared with 0.163c charged by the vessel owners. Of course, as has been said, the actual freight rate is probably higher than 0.163c per ton mile. Be that as it may, the calculation which has been made shows the probable freight rate by water, between Fort William and Montreal, to be slightly higher than the actual rate by rail between those points."

(There will probably be considerable divergence of opinion in regard to the Comptroller's calculations respecting the comparative cost of water and rail carriage as above quoted. We will be pleased to hear from any of our readers on this subject, which is a most important one and worthy of very full discussion.—Editor.)

B.C. Joint Stock Companies' Non-compliance with Regulations.

The following companies have been officially notified that they will be struck off the register of British Columbia companies unless they show cause to the contrary, having failed to comply with the regulations:—Vancouver Improvement Co.; Esquimalt Marine Railway Co.; British Columbia Towing and Transportation Co.; Victoria Towing Co.; Victoria Sealing and Trading Co.; People's Steam Navigation Co.; Westminster Steam Navigation Co.; British Columbia Deep Sea Fishing Co.; Fraser River Fish Co.; American Fish Co.; Imperial Steamship Co.; Burrard Inlet Sealing and Trading Co.; Pacific Traders and Navigation Co.; British Columbia Fishing and Trading Co.; Vancouver Steamship Co.; Slocan Trading and Navigation Co.; San Juan Fishing, Canning and Trading Co.; Northern Shipping Co.; Pacific Fish Co.; Western Dredging Co.; Clayoquot Fishing and Trading Co.; British Columbia Tug Co.; Victoria Fishing and Trading Co.; Lower Fraser River Navigation Co.; Vancouver Marine Ry.; Kelowna Shippers Union Co.; North British Columbia Navigation Co.; Rothesay Shipping Co.; Yukon Hootalinkwa Navigation Co.; Teslin Transportation Co.; Stikine Navigation Co.; Glenora Steamship Co.; Teslin Yukon Steam Navigation Co.; Casca Trading and Transportation Co.; Victoria, Bennett and Dawson Transportation Co.; Big Bend Transportation Co.; Dominion Steamboat Line Co.; Fraser River and Coast Navigation Co.; Card Steamship and Trading Co.; Yukon Flyer Line; Atlin Transportation Co.; Sandon Forwardwarding Co.; Vancouver Coast Line Steamship Co.; British Yukon Navigation Co.; British Columbia Fish Co.; Western Steamboat Co.; Pacific Barge Co.; Western Canadian Fish Co.; Victoria Steamship Co.; Coutli Shipping Co.; Venture Steamship Co.; British Pacific Fishing and Canning Co.; Vancouver Skeena River Navigation Co.; Everett G. Griggs Ship Co.; Skeena River Navigation Co.; C. Gardiner Johnson Shipping, Insurance and Wharfage Co.; British Columbia Transportation and Commercial Co.; G. H. Trench Tug Boat Co.; Virginia Dredging Co.; Greer, Courtney and Skene; Steamer H. C. Henry; Twin City Transportation Co.; North British Columbia Navigation Co.; Skeena River Transportation Co.; Cariboo Navigation and Development Co.; Island Dock and Warehouse Co.; Queen Charlotte Whaling Co.

A new steel yacht, costing $11,500, with capacity for about 150 passengers, was launched from Polson Iron Works, Toronto, early in June, for the Royal Canadian Yacht Club. The hull is divided into five watertight compartments with steel transverse bulkheads between. Her dimensions are, length 70 ft., breadth 15 ft., depth 6 ft. 2 in., with a draught of four feet. She is equipped with compound jet condensing engines, with cylinders 7 and 14 ins. diar. by 10 ft. stroke, and is lighted by electricity.

The U.S. Senate recently passed a bill making it unlawful for any ocean or lake steamer of the U.S., or any foreign country, carrying 50 or more persons, whether passengers or crew, to leave any U.S. port unless equipped with an efficient apparatus for radio communication, in good working order, in charge of two or more skilled operators, one of whom must be on duty at all hours of the day or night, the apparatus to be capable of transmitting at least 100 miles. An auxiliary plant, independent of the vessel's main electric plant, must be provided, which will enable the operator for at least two hours to transmit messages 100 miles under all conditions of atmospheric disturbance, when it is safe for the operator to work.

Atlantic and Pacific Ocean Marine.

The arrivals of ocean going steamships at Montreal, for May, were 73, with an aggregate gross tonnage of 478,073.

The Elder Dempster Co.'s s.s. Canada Cape, from St. John, N.B., to Cape Town, South Africa, which was reported beached after a fire on board, has been floated and docked at Cape Town.

The Thomson Line s.s. Cairn Dhu sailed from Newcastle, Eng., June 13, on her maiden trip, and arrived at Montreal, June 25, being the first vessel by the Belle Isle route this season.

The Canadian Brazilian Shipping Co., Ltd., has been incorporated under the Dominion Companies Act, with $300,000 capital, and office at Toronto, to carry on a general ship owning and navigation business.

A Montreal press dispatch of June 8 stated that the Canadian Northern Steamships, Ltd., would probably add another steamship to its fleet this year. Enquiry of the management fails to confirm this, and it is not probable that there will be any addition to the fleet during this year.

The British steamship Fishpool, which loaded grain at Montreal, early in June, for European ports, is a new vessel, having just been built at West Hartlepool, Eng., this being her maiden trip. Her dimensions are, length, 399 ft.; beam, 56 ft.; depth 26¾ ft.; tonnage, 4,552 gross, with cargo capacity of 8,200 tons.

The Dominion Government is calling for tenders for a fast steamship service between Canadian ports and British Guiana, calling at islands in the British West Indies, which have signed trade agreements with the Dominion, and for a second steamship service between the Maritime Provinces and Jamaica, calling at Bermuda.

E. J. Chamberlin, President, G.T.R. and G.T. Pacific Ry., is reported to have stated, June 20, in Montreal that a line of steamships would be placed on the Pacific by the company as soon as the railway was completed. The sailings will take place from Prince Rupert, from which port to the Orient, it is said, there will be a saving of two days.

It is reported at Victoria, B.C., that the underwriters have declined the offer of a Japanese syndicate for the purchase of the wrecked s.s. Empress of China, the sum not being high enough, and that they will take the vessel to Hong Kong, where temporary repairs will be carried out, sufficient to allow of her being taken to England, where she will again be offered for sale.

Holt and Co., operating the Blue Funnel Line, are reported to have withdrawn from the North Pacific conference, and notice is stated to have been given for shippers in the Orient that any consignment of freight given to that line will invalidate any claim to participate in the deferred rebates payable by the lines constituting the conference, amongst which is the C.P.R.

A press report from London, Eng., June 11, states that the Cunard Line has declined the offer of the White Star Line to pay the company for its services in connection with the saving of life in the Titanic disaster, but it will allow the crew of the s.s. Carpathia to receive gifts from the White Star Line as follows:—To the captain, 100 guineas; to the surgeon, purser and chief steward. 50 guineas each, and to each of the crew, one month's pay.

Sir Thomas Shaughnessy, on his recent return from Great Britain, is reported to have stated in Montreal, June 10, that no doubt the matter of new vessels for the Atlantic service, so constructed that they could be converted into auxiliary cruisers, would be discussed with the Britsh Government, in the course of the Dominion Premier's visit to England. He is also reported to have stated that he could not say whether the C.P.R. would tender in connection with the proposed West Indies service.

J. H. Welsford and Co., Liverpool, Eng., who control the Union Steamship Co., and who recently acquired the Canadian Mexican Pacific Steamship Co., and the Boscowitz Steamship Co., have made an offer to inaugurate a steamship service between Canada and Australia, if the Dominion Government will allow an adequate subsidy for three years. The matter is being discussed by the Vancouver board of trade, and probably a resolution urging the Government to take up the matter will be passed.

In connection with the report that the White Star-Dominion Line was having two steamships built for the St. Lawrence service, to replace the Teutonic and Canada, the company has issued a statement to the effect that no new vessels are being built at present for this route, nor is the construction of any contemplated in the immediate future, but the company intends to keep abreast of its competitors by adding to its tonnage on the St. Lawrence and other routes, as occasion may require.

Maritime Provinces and Newfoundland.

The Department of Public Works received tenders, June 27, for the construction of a breakwater wharf at Carrs Brook, N.S.

The Dominion Atlantic Ry., at the end of May, commenced a new steamship service between St. John, N.B, and Halifax, N.S., by way of Digby, making two trips each day, with the steamships Prince Rupert and Yarmouth.

Work is proceeding on the construction of the wharf on the west side of St. John Harbor. The crib work is being pushed forward as quickly as possible, and the complete concrete construction plant arrived on the site, June 12.

The Reid Newfoundland Co. commenced a daily express steamship service between Port aux Basques and North Sydney, N.S., June 3, replacing the old tri-weekly service. The steamships Bruce and Invermore are being operated on the route.

The Island Tug Co., Charlottetown, P.E.I., has appointed the following officers for its vessels for the current year:—Fred M. Batt, captain W. P. Bourke, chief engineer W. McEachern; Harland, captain J. T. McLaine, chief engineer A. Roebuck; Islander, captain G. Batt, chief engineer J. Stewart.

Following the submission of Prof. Kirkpatrick's report on ice floes and currents between the main land and Prince Edward Island, the Minister of Railways and Canals has decided that Cape Tormentine, N.B., and Carleton Point, P.E.I., shall be the points between which the proposed car ferry service between the main land and the island shall be operated. The distance is given as 10 miles, and it is stated that not only is the route selected the shortest, but it offers the least difficulty to navigation at all seasons. Tenders will be asked shortly for the vessels, as soon as the type to be adopted is decided on.

Province of Quebec Marine.

Capt. L. A. Demers, heretofore Dominion Wreck Commissioner, has been appointed harbor master at Montreal.

W. S. Jackson is reported to have been appointed Superintendent of the Government shipyard at Sorel vice L. J. Papineau, resigned.

A resolution was adopted by the Quebec board of trade, June 11, urging the Dominion Government to put the law respecting the reduction of the Quebec Harbor Commission to three members, in force, so that they could devote their whole attention to the many questions affecting the port.

The Minister of Railways and Canals, accompanied by the Ministers of Customs and Agriculture, inspected the canals between Prescott and Montreal, early in June, arriving at Montreal, June 6, where they were met by the Harbor Commissioners, and proceeded to Viauville, inspecting the harbor works en route.

The Quebec board of trade on June 11, again discussed the matter of the carrying of transatlantic freight intended for Quebec, to Montreal, and returning it to Quebec by rail. It was suggested that European shippers should be advised only to ship Quebec freight by those vessels which would land same at Quebec.

The Montreal Harbor Commissioners have added a bylaw to their regulations, requiring that the agent of every vessel arriving in the harbor, the cargo of which is subject to wharfage rates, shall within four days after arrival deposit in the Commissioners' office a certified copy of the manifest, giving names of consignees, description of goods, and weight, or measurement, according as the goods were carried by ton weight or ton measurement.

The steamboat Iona, owned by F. E. Hall and Co., Montreal, was burned recently on Lake Ontario, near Oswego, N.Y., while bound from Sodus Point, N. Y., to Quebec, with coal. She was a wooden vessel, and was built at Trenton in 1892. Her dimensions were, length, 123 ft.; breadth, 24.2 ft.; depth, 10.2 ft.; tonnage, 232 gross, 157 register, and she was equipped with engine of 10 n.h.p., driving a screw. The loss is stated as $20,000, which is covered by insurance.

Plans for the improvement of the harbor at Quebec are in course of preparation, and it was expected that they would be submitted to the Public Works Department for approval, towards the end of June. It is reported that they provide for the commencement of a deep water dockage along the St. Lawrence River front from the west end of the Allan Line property in the direction of Sillery, and the erection of a grain elevator of considerable capacity. The plans for pier 2 have been approved, and it is stated that tenders will be invited shortly.

Ontario and the Great Lakes.

Capt. T. Lundy, a well known lake mariner, died at Toronto, June 14, aged 83. He was born in England, but lived in Canada for 70 years.

The vessel Toiler, which grounded recently near Cardinal, was released May 31, with very little damage, and proceeded to Montreal under her own power.

The North West Steamship Co. is reported to have decided to have built at Port Arthur a full size lake freighter, for trading between Port Arthur, Port Colborne, Georgian Bay ports and Buffalo.

A survey party is engaged in taking levels, etc., for the construction of the dock at New Liskeard, by the Dominion Government, at a cost of about $15,000. The site selected for the dock is stated to be south of the old dock facing the lake.

The Ontario and Quebec Navigation Co.'s plans for 1913 include the construction of an additional steamboat for the Toronto and Quebec route. She will probably be 217 ft. long, with 43 ft. beam, and will be of similar type to its steamboat Geronia.

The Richelieu and Ontario Navigation

Co. is stated to have decided to build, for operation in the Montreal service, at the opening of navigation in 1913, a ferry steamboat, 200 ft. long, capable of carrying about 3,000 passengers. The cost is estimated at $150,000.

The Richelieu and Ontario Navigation Co.'s steamboats Rapids Prince and Rapids Queen, recently completed their first trips, using oil as fuel, and C. J. Smith, General Manager, is reported to have stated that the change from coal to oil had proved a success.

The steam tug Home Rule, owned in Amherstburg, is reported to have been sold to Jas. Whalen, Port Arthur. She was built at Thorold in 1890, and is screw driven, with engine of 50 n.h.p. Her dimensions are: Length 74.9 ft., breadth 17 ft., depth 9.4 ft., tonnage 81 gross, 45 register.

The steamboat Ella Ross, which was burned at Parry Sound, June 5, was built at Deseronto in 1879, and was at one time named Gipsy. Her dimensions were: length 99.2 ft., breadth 27.8 ft., depth 6.4 ft.; tonnage, 228 gross, 125 register, and she was equipped with engine of 85 n.h.p., driving a paddle wheel.

The Canadian Interlake Line steamboat Hamiltonian was launched at Port Arthur, June 1. It was expected that she would be ready for service before the end of June. The company's freighter Indian, equipped with Diesel engines, was expected to arrive on the lakes, from Newcastle, Eng., by the end of June.

The Minister of the Interior, in speaking at Regina, Sask., June 11, stated that the Government had acquired 68 acres of water frontage at Port Arthur, on which would be built a terminal elevator, which, he stated, would, with the expected keeping open of navigation a month longer than customary, considerably minimize the chances of future grain blockades.

The Canadian Lake and Ocean Navigation Co. is reported to have withdrawn its abandonment of the wrecked steamboat Turret Cape, to have accepted $35,000 from the underwriters in settlement of its claims, and to have resumed possession of the vessel. She was taken to Collingwood for overhauling and repairs, and it was expected that she would again be ready for service by the end of June.

The U.S. Lake Survey reports the levels of the Great Lakes in feet above tide water, for May, as follows:—Superior, 602; Michigan and Huron, 579.93; Erie, 572.54; Ontario, 246.82. Compared with the average May levels for the past 10 years, Superior was 0.07 ft. below; Michigan and Huron, 0.81 ft. below; Erie, 0.15 ft. below, and Ontario, 0.12 ft. above. It was anticipated that, during June, there would be a rise in Superior, Michigan and Huron, of 0.3 ft., in Erie, 0.2 ft., and in Ontario, 0.1 ft.

G. J. Guy, chairman of the Hamilton Harbor Commission, on his recent return from Ottawa, was reported to have stated that the commission's scheme for harbor improvements, covering the construction of a new landing dock, extension of the revetment wall, warehouses and railway switches, had been approved, and the work would be proceeded with at once. It was stated that the Government would spend about $300,000 on the revetment wall this season, and that tenders would be asked shortly.

The District Engineer, Public Works Department, reports that soundings recently taken at Port Stanley indicate that the water has shoaled in a tongue from the westward outside the end of the new breakwater, and that soundings of less than 18 ft. extend 300 ft. outside the end of the breakwater and 225 ft. to the eastward of the alignment of the two lights. By approaching the outer light on a course 311 deg., the shoal will be cleared. Soundings taken inside the breakwater indicate that vessels may draw 18 ft. as far in as the inner end of the east Government pier, from that point inward, 16 ft. only is available.

Manitoba, Saskatchewan and Alberta.

The Lake Winnipeg Shipping Co., Ltd., is applying for supplementary letters patent varying the provisions as to the number and amount of the shares of capital stock, and confirming a bylaw changing the number of shares from 5,000 to 100,000, and the amount of each share from $100 to $5.

The Department of Public Works has authorized the construction of a 40 ft. canal at Lacalle Falls, on the Saskatchewan River, where the city of Prince Albert, Sask., has a power plant. The settlement of this matter has been somewhat delayed, owing to the demand for a 50 ft. canal, but it is now considered that one of 40 ft. will be sufficient to carry any craft operating on the Saskatchewan River.

British Columbia and Pacific Coast Marine.

The G.T. Pacific Coast Steamship Co.'s s.s. Prince John was recently docked at Esquimalt for examination and repairs after stranding on Masset bar. She returned to service early in June.

The Board of Railway Commissioners has authorized the Vancouver, Victoria and Eastern Ry and Navigation Co. to build a dock and warehouse at Burrard Inlet, and has rescinded order 15093, Oct. 16, 1911, which authorized similar work.

The B.C. Marine Association has advanced the wages of longshoremen on the Vancouver waterfront from 35 to 40c an hour for day work, and from 40 to 50c an hour for night work and overtime. The wages of dockers and truckers are still under consideration.

The report of the Canadian North Pacific Fisheries, Ltd., for 1911, shows net earning from operation for the year of $478,073, of which $100,000 is required for interest on debenture stock, leaving a surplus for sinking fund, reserves and dividend on ordinary shares of $378,073.

The Union Steamship Co.'s s.s. Chelohsin, which was recently damaged in the Skeena River, has had her repairs completed at North Vancouver, at a cost of about $25,000, and has returned to service. The report that she was being equipped with oil burning apparatus is denied.

The steamship companies operating between Vancouver and Prince Rupert have increased their passenger rates between these two points, including intermediate ports. No change has been made in the rates to the south, and nothing is contemplated in regard to freight rates.

The Dominion Government has granted permission to the Victoria Sealing Co. to sell its fleet of sealing schooners, without prejudice to its claim for compensation advanced as a result of being deprived of its rights under the sealing treaty of last year, between Canada, the United States, Japan and Russia.

The Point Grey, South Vancouver, Burnaby and Richmond boards of trade have passed a joint resolution calling upon the municipalities to engage the services of an engineer to report on the dredging of the North Arm to 20 ft. at low water, and to build a suitable wing dam and protection works at the mouth.

Capt. H. G. Jarvis, Secretary-Treasurer of the Merchant Service Guild of British Columbia, has sent a complaint to the Marine Department, that U.S. vessels when navigating British Columbia waters, consistently ignore the International Rules of the Road, which are in force there, and use the U.S. Inland Rule of the Road.

E. J. Fader, New Westminster, has applied to the city council for approval of plans for the extension of his wharf and for building a large warehouse, making the wharf 400 by 50 ft., the new warehouse being 42 by 200 ft. He stated that his business had been acquired by an English company with a capital of £250,000, and registration under the B.C. Companies Act would shortly be asked. It is said to be the intention to operate a steamboat service between New Westminster and Victoria.

The West Vancouver Transportation Co. has offered to transfer the whole of its ferry equipment to a new company for $65,000, stipulating that an adequate ferry service be maintained between Hollyburn and Vancouver. The West Vancouver council has recommended the ferry company in course of formation to accept the offer of the ferry steamboats Sea Foam and West Vancouver, with all equipment, the same to be taken over and paid for as soon as the money bylaw for that purpose has been carried and the municipality authorized to subscribe for shares in the company. A bylaw is being prepared authorizing the issue of debentures for $30,000 to purchase 300 shares of $100 each in the company.

Department of Railways and Canals, Canada.

WELLAND CANAL.

NOTICE TO CONTRACTORS.

SEALED TENDERS, addressed to the undersigned, and endorsed "Tender for Port Colborne Entrance Improvements," will be received at this office until 16 o'clock on Wednesday, the 9th July, 1912.

Plans, specifications and form of contract, to be entered into can be seen on and after this date at the office of the Chief Engineer of the Department of Railways and Canals Ottawa, and at the office of the Superintending Engineer of the Welland Canal, St. Catharines, Ont., at which places forms of tender may be obtained.

Parties tendering will be required to accept the fair wage schedule prepared, or to be prepared by the Department of Labor, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $20,000, made payable to the order of the Minister of Railways and Canals, must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work at the rates stated in the offer submitted.

The cheque thus sent will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security or part security, for the due fulfilment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,

L. K. JONES, Secretary.

Department of Railways and Canals,
Otawa, June 25, 1912.

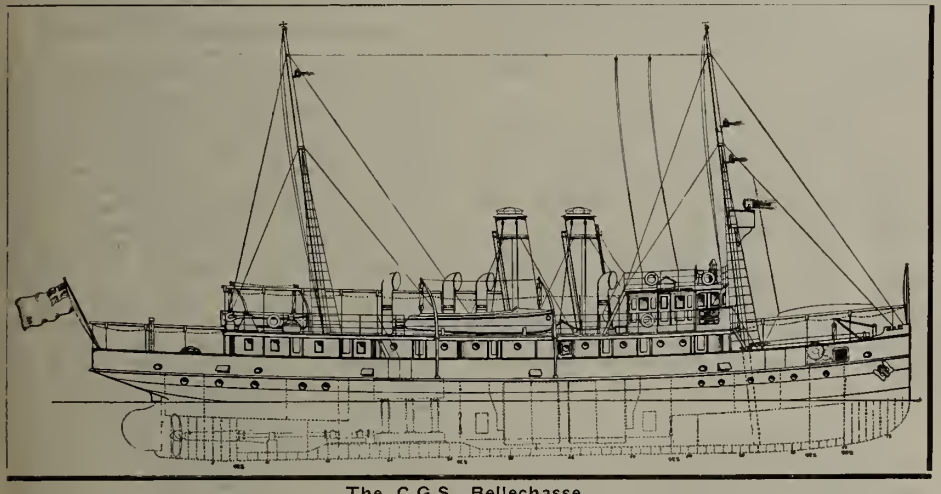
Newspapers inserting this advertisement without authority from the Department will not be paid for it.—25029.

Dominion Government Steamship for St. Lawrence Ship Channel.

The C. G. S. Bellechasse, the launching of which at Kingston, Ont., was mentioned in our last issue, has the following dimensions:—Length over all, 140 ft.; length b.p., 130 ft.; breadth, moulded, 27 ft.; depth, moulded, 13½ ft.; draught mean, 9½ ft.; i.h.p. maximum, 1,300.

The Bellechasse has been specially designed as a survey and inspection steamer for the St. Lawrence ship channel service and will be used by the Superintending Engineer to the Government, V. W. Forneret, for the furtherance of the schemes below Quebec.

The vessel is built of steel throughout to Lloyds 100 A1 class and has a straight stem, elliptical stern, and five main watertight bulkheads. The hull has been specially strengthened forward and along the vicinity of the water line, as it is intended to utilize the vessel in light ice work during certain periods. Duplicate electric generating plants are installed on board, of 9½ k.w. capacity, each unit being capable of running the complete lighting of the ship, and in addition a set of Edison accumulators is provided capable of running 25 lamps for 10 hours. The search light, of 16,000 c.p., is placed on the foremast. The deck auxiliaries include the usual windlass, capstan, steering gear and boat hoisting winch, the former being specially designed for channel sweeping operations.



The C.G.S. Bellechasse.

Accommodation has been provided for a total complement of 22, including staff, officers and men. The crew's quarters are placed forward on the lower deck, the staff's quarters on the lower deck aft, and on the main deck are the staff dining saloon, officers' cabins, mess room, galley, pantries, baths and wash houses. A special draughting room is provided in a large teak deck-house on the boat deck adjacent to the lower navigating position. Throughout the accommodation a complete service of hot and cold water is supplied, the pumps for this installation being placed in the engine room. In addition to the usual ship's boats there is provided on the boat deck a motor launch having a speed of about 10 miles. The cold storage chambers are fitted on the lower deck forward of the crew's quarters.

The bunkers are placed longitudinally on each side of the boiler room and have a capacity of about 100 tons, providing a radius of action under reduced power of about 2,000 knots. The propelling machinery consists of two sets of triple expansion surface condensing engines having cylinders 12½, 21 and 34 ins. diam. by 21 ins. stroke, and working under a pressure of 180 lbs. per sq. in. The motive power is supplied from two cylindrical boilers fitted with Morison furnaces and working under a system of air pressure, the fan and engine being placed in the engine room. Each boiler is fitted with a patent temperature balance The condensers are of the uniflux type and all the auxiliaries, circulating pumps, air pumps, feed pumps, bilge pumps, general service pumps, fresh water and sanitary pumps are independent of the main engines.

On completion the Bellechasse will undergo a series of exhaustive trials. In addition to the usual dock trials progressive trials from six knots upwards will be held, after which the full power trials will take place.

The Bellechasse has been designed by and built under the superintendence of Chas. F. M. Duguid, Naval Constructor to the Marine and Fisheries Department.

The Proposed Dry Dock at Quebec.

The Dominion Government, which recently asked for tenders for the construction of a dry dock and ship building plant for Quebec or Levis, has received a report, from M. F. G. Wilson, C.E., of England, who was specially engaged for the purpose, on the merits of the various sites suggested for the construction. In conversation with a representative of the local press, June 5, Mr. Wilson is reported to have stated that he had made a careful examination of all the plans submitted for plants at St. Joseph de Levis and Beauport, and had taken information from practical shipping men on ice conditions, etc., and learned their opinions as to the most desirable site. The opinions he had gathered from others would in no way influence his personal judgment, and his recommendation as to the site to be chosen would be discovered from his report.

It was stated in Ottawa, June 14, that the report submitted recommended the site at St. Joseph de Levis, it being stated to be the easiest of approach and less difficult for the proposed construction.

Capt. J. J. Riley, heretofore Superintendent of Pilots, has been appointed Dominion Wreck Commissioner, vice Capt. L. A. Demers, appointed harbor master at Montreal.

The investigation which is being undertaken by the Department of Trade and Commerce, with a view to the adoption of a strong policy for the development of Dominion trade channels, will cover the question of insurance rates generally, and also the proposal to establish a Canadian Lloyd's, which is now deemed to be essential.

Wireless Telegraphy on the Great Lakes.

We were officially advised, June 8, by the Naval Service Department's Radio Telegraph branch that the wireless telegraph stations at Sault Ste. Marie, Tobermory and Midland were practically completed, and would be in operation in a week or ten days thereafter. They are equipped with the latest type of wireless apparatus, and are up to date in every way.

These stations, and also the one at Port Arthur, which was put in operation in Dec., 1910, are owned and controlled by the Government, and will be operated under contract by the Marconi Wireless Telegraph Co. of Canada.

Tenders have been invited for the erection of a wireless station at Point Edward, near Sarnia, Ont., on which construction will be started as soon as possible. It is also intended to establish stations at Port Stanley, Port Colborne, Toronto and Kingston, Ont., and it is expected to have them ready by the opening of navigation next year.

The Marconi Wireless Telegraph Co. is operating wireless telegraph apparatus on all the C.P.R. upper lake vessels, Alberta, Assiniboia, Athabasca, Keewatin and Manitoba, on three of the Northern Navigation Co.'s vessels, Hamonic, Huronic and Saronic, and on the Canadian Towing and Wrecking Co.'s barges, Empire, Imperial and Provence. These vessels are fitted with the 1½ k.w. apparatus, their range depending on the height of their masts and the distance between them, but it is generally in the neighborhood of 200 miles.

There are a large number of vessels on the great lakes operated by the Marconi Wireless Telegraph Co. of America, some of which are, 5 of the G. and M. Line, 10 of the Goodrich Line, 3 of the Northern Michigan S.S. Line, 5 of the P. and M. Rd. car ferries, 4 of the A.A. Rd. ferries, 5 steamboats of the Schenango S.S. and Rd. Co., 5 of the Detroit and Cleveland Navigation Co., 9 of the United States Naval Militia, 4 of the Chicago and Duluth Transportation Co., and between 10 and 20 belonging to companies of lesser importance. Of course a large number of these vessels ply in Lake Michigan and will not communicate with the Canadian stations.

Dry Dock and Shipbuilding Plant for Sydney, N.S.

The ratepayers of Sydney, N.S., on June 4, decided by a vote of 1,041 to 172, to grant a bonus of $1,000,000 to the British Canadian Shipbuilding and Dry Dock Co., for the construction of a dry dock and shipbuilding plant there. The bonus will be paid in four instalments of $250,000, on a minimum expenditure of $6,000,000. The site selected is on what is known as the Brookdale property, just below the International pier, and within the city limits.

A. C. Ross, who is interested in the project, is reported to have stated, June 4, that work would probably be under way by the early fall, and that it is the intention to form a Canadian construction company to build the plant, but a large portion of the work, such as dredging, excavation, etc., would be sublet to local contractors. In order to carry out the Government requirements in regard to dry dock of the first class, the work will occupy about five years, but the marine railway and shipbuilding yards should be ready for operation within two years, and the first vessel should be launched within three years. A wrecking and salvage plant will also be operated.

Sir Henry M. Pellatt, Toronto, is one of the promoters of the company.

New Freighter for Ottawa Forwarding Company.

The steamboat which is under construction at Kingston, Ont., for the Ottawa Forwarding Co., has the keel plate of steel, with keelson 18 by 6 ins., 70 lbs., of I beam type, with steel stem forging from keel turn, rivetted to keelson, and extending above the forward deckhouse to form support for the railing. The stern post is a steel casting with bulb for stern tube and shoe, all in one casting. The frames are 2½ by 3 by 5-16 in. angles, and the floor plates are 10 by 5-16 in. The frames throughout are spaced 18 ins. centres, and the deck beams 5 by 3 ins. steel angles are spaced 18 ins. centres and bent to 6 ins. in 25 ft. Deck stringers are 48 by 5-16 in., and side sheeting is formed up with a 48 by ⅜ in. sheer strake and a 41 by 9-16 in. sheeting bolted below, from the bilge to the shear line. The sides are protected by 2½ by 3 ins. angles, fitted with heavy oak wales, and the bottom is planked with 3 ins. oak planking securely bolted to the frames.

The deck house forward is of steel 24 ft. long, and provides quarters for the captain, first and second officers and quarters below deck for the crew in the fore peak of the hull. A collision bulkhead separates this section from the main hold of the vessel. On the top of the deck house is the wheel house, equipped with steam steerer and fresh water tanks. The after deck house is also of steel, 40 ft. long, forming enclosures for machinery and quarters for the engineers and cook. The galley and mess rooms are arranged aft of the engine room. The vessel's dimensions are, length over all, 113 ft.; beam, 25 ft.; depth, 9 ft. The machinery consists of a compound engine with cylinders 11, 22, 22 ins. diar. by 16 ins. stroke, open front type with link motion, supplied with steam by a boiler for a working pressure of 137 lbs. The equipment includes high duty duplex boiler feed pump, independent air pump and jet condensor, arranged to pump from the bilge in case of accident, two hand capstans and one double drum steam winch with mast and boom for handling cargo.

She is intended for the general river trade in lumber, coal, grain and package freight.

Improvements for Vancouver Harbor.

E. D. Lafleur, of the Public Works Department, has advised that in order to work out a comprehensive scheme of improvements for Vancouver harbor, to meet the future requirements of the port, a complete survey of the harbor be made, including Burrard Inlet, up to, and beyond the Second Narrows, False Creek and the North Arm of the Fraser River. He recommends that a pier or dock should be built at some point on Burrard Inlet most suitable for shipping, about 800 ft. long by 250 ft. wide, with at least 30 ft. of water at low tide at the shore end, with warehouses, tracks and full equipment for handling merchandise; a similar pier or dock at North Vancouver; the maintenance of a channel with a minimum of 15 ft. depth at low water from New Westminster through the sandheads to the Gulf of Georgia; improvement of False Creek, by locks or dam at the outlet, or both combined; the relocation of the C.P.R. bridge, and the continued dredging of the First Narrows until the widening is completed and the Parthia shoal removed, and the Capilano River diverted to the west to prevent sand being washed into the dredged channel. The Minister of Public Works has approved the outlines of the scheme and instructions have been given for the prosecution of the work.

Canadian Notices to Mariners.

The Department of Marine has issued the following:—

37. May 29. 95. British Columbia, Prevost passage, uncharted rock, buoy established. 96. British Columbia, Queen Charlotte islands, Hecate strait, Skidegate inlet, eastward of Deadtree point, buoy established.

38. May 30. 97. Nova Scotia, south coast, Peggy point, hand fog horn at light station. 98. Quebec, Restigouche river, changes in buoyage. 99. Quebec, River St. Lawrence, St. Pierre les Becquets, light discontinued.

39. June 8. 100. Prince Edward Island, north coast, Tracadie, change in position of front range lighthouse. 101. Quebec, Chaleur bay, Newport point, light improved. 102. Quebec, St. Lawrence river, Saguenay river entrance. Tadousac, new wharf. 103. Quebec, River St. Lawrence, Montreal harbor, Ile Ronde range, light on Guard pier discontinued, temporary back range light shown on new pier at Ile Ste. Helene.

40. June 10. 104. Ontario, Lake Ontario, Welland canal entrance, Port Dalhousie, change in front range light. 105. Ontario, Lake Huron, north channel, off Gibbons point, uncharted rock. 106. Ontario, Lake Superior, hand fog horn at light station on island west of Shaganash island.

41. June 11. 107. British Columbia, Vancouver Island, southeast coast, Victoria harbor, Brotchie ledge beacon, change in characteristic of light. 108. United States of America, Washington, Destruction island light station, fog signal to be changed.

42. June 14. 109. Nova Scotia, southwest coast, Barrington bay, Congress shoal, buoy established. 110. Nova Scotia, south coast, submarine bell buoy to be moored near Sambro gas and whistling buoy for experimental purposes. 11. Nova Scotia, south coast, New harbor, whistling buoy moved to eastward.

43. June 18. 112. Nova Scotia, south coast, Coddle harbor, buoys established. 113. Prince Edward Island, north coast, Cascumpeque harbor, Alberton, change in position of range lights. 114. Quebec, Gulf of St. Lawrence, Gaspe coast, Great Fox river, change in position of front range light.

44. June 19. 115. Caution when approaching Canadian ports (Halifax, Quebec, Esquimalt), closing of ports, examination service. 116. Canada, signals to be made by vessels approaching defended ports when inconvonienced by search lights.

New Steamship for C.P.R. British Columbia Coast Service.

The vessel which is under construction at Esquimalt, B.C., for the C.P.R. service on the west coast of Vancouver Island, as noted in previous issues, has the following dimensions:—Length between perpendiculars 232 ft., beam moulded 38 ft., depth moulded 17 ft.

She will be built of steel, in accordance with Lloyd's rules for a 100 A1 awning deck class of vessel, and will have double bottom throughout, and special tanks for oil fuel. The accommodation for both passengers and freight will be of the most modern type, specially suited for the trade in which she will be engaged.

The machinery will consist of triple expansion engines, with cylinders 20, 34 and 53 ins. diar. by 36 ins. stroke, supplied with steam by two boilers 13½ ft diar. by 12 ft. long, and she will be capable of a speed of 12 knots an hour in the open sea.

International Inspection of Steamboats.

A United States steamboat inspection official at Oswego, N.Y., recently ruled that all boats plying between Canada and the U.S. must be inspected at U.S. ports. Francis King, counsel, Dominion Marine Association, took the matter up with the Secretary of Labor and Commerce at Washington, D.C., and received a letter from the acting Secretary, who said:—"It has long been the practice for inspectors of this country statloned at ports on the Great Lakes to inspect Canadian vessels at their home ports when requested by the owners, and this practice has been quite satisfactory to all interests. The local inspector at Oswego has been instructed by the Supervising Inspector-General, Steamboat Inspection Service, this department, to continue to inspect Canadian vessels at their home ports when requested."

F. E. Stearns, A.M. Can. Soc. C.E., has been appointed Assistant Engineer for the construction of the new Welland canal. He is a graduate of McGill University and has been engaged since 1907 on lock gate design on the Panama canal.

Sault Ste. Marie Canals Traffic.

The following commerce passed through the Sault Ste. Marie Canals during May, 1912:

Articles			Canadian Canal	U. S. Canal	Total
Copper	Eastbound	Short tons	1,136	16,909	18,045
Grain	"	Bushels	7,553,918	4,283,583	11,837,501
Building stone	"	Short tons	.....	2,250	2,250
Flour	"	Barrels	281,720	655,360	937,080
Iron ore	"	Short tons	3,923,545	1,589,854	5,513,399
Pig iron	"	"	.....	.....	.....
Lumber	"	M. ft. b.m.	734	67,516	68,250
Silver ore	"	Short tons	.....	.....	.....
Wheat	"	Bushels	27,122,703	7,450,808	34,573,511
General merchandise	"	Short tons	1,120	24,585	25,705
Passengers	"	Number	933	689	1,622
Coal, hard	Westbound	Short tons	9,646	8,202	17,848
Coal, soft	"	"	255,396	1,350,847	1,606,243
Flour	"	Barrels	.....	.....	.....
Grain	"	Bushels	.....	.....	.....
Manufactured iron	"	Short tons	25,659	75,409	101 068
Iron ore	"	"	.....	500	500
Salt	"	Barrels	23,594	195,428	219.022
General merchandise	"	Short tons	65.743	81,549	147,292
Passengers	"	Number	1,501	436	1,937
Summary.					
Vessel passages		Number	1,164	2,083	3,247
Registered tonnage		Net	3,686,019	4,086,344	7,772,363
Freight—Eastbound		Short tons	4,908,670	2,122,388	7.031,058
" —Westbound		"	359,814	1,545,821	1,905,635
Total freight		"	5,268,484	3,668,209	8,936,693

Dominion Steel Corporation, Ltd.

At the annual meeting at Montreal, June 12, the report for the period commencing July 1, 1910, the date of the present incorporation, to Mar. 31, 1912, was presented. The net earnings, after paying preferred and common stock dividends, were $1,484,945.98. Of this $700,000, forming part of the $500,000 written off last year from the coal properties, and $500,000 from the steel properties, as a special appropriation from the surplus earnings in addition to the usual full provision for depreciation, must also be deducted, leaving a surplus to be carried forward of $784,945.98. The coal company's operations were satisfactory in every respect, and the prospects for the current year excellent. Up to June 11, the company was 192,291 tons ahead of the previous year's production, the output since Apr. 1, being 792,753 tons. The St. Lawrence business will show a heavy increase, if no serious drawbacks are met with.

Regarding steel, the company has suffered in common with all other manufacturers of iron and steel on this continent, from depressed conditions prevailing in the U.S., where prices were demoralized, but business there is improving and prices advancing. In addition the new finishing mills will soon provide a more profitable outlet for the steel, hitherto used as wire rods. The output of steel was substantially larger than in last year, and so far this year the output is well ahead of last year. The completion of the new plant has been subject to many delays, but the wire mills are running in a partial way to get the machinery and organization into shape. The first of the new blast furnaces is rapidly approaching completion, and the remaining extensions are well forward.

The Corporation has issued $7,000,000 6% preference shares, and with regard to the issue of 2,500 shares of common stock it was explained that the requirements of the coal and steel companies in the way of lumber, piles, ties, pit props, etc., have grown to very large dimensions, reaching not less than 8,000,000 ft. annually, and to this supply is being added staves, heading and other things required in the new mills. To buy these supplies has become more and more difficult and costly, so it was decided to acquire the Sydney Lumber Co., Ltd., Dalhousie, N.B., consisting of saw mills, timber limits, etc., in running order, which will be used to serve both coal and steel companies, the corporation holding the stock. The same principle will be followed in the case of the Black Diamond Steamship Line, to which two vessels have been added this year.

The following were elected directors for the current year:—

Dominion Steel Corporation, Ltd.—President, J. H. Plummer; Vice President, Sir Wm. C. Van Horne; other directors, Sir Montagu Allan, G. Caverhill, Hon. G. A. Cox, Hon. R. Dandurand, Hon R. Mackay, Hon. D. McKeen, Sir Wm. Mackenzie, W. McMaster, Jas. Mason, F. Nicholls, Sir Henry Pellatt, W. G. Ross and J. R. Wilson.

Dominion Coal Co., Ltd.—President, J H. Plummer; Vice President, J. R. Wilson; other directors, Hon G. A. Cox, Hon. R. Dandurand, Hon. R. Mackay, Sir Wm. Mackenzie, W. McMaster, Jas. Mason, W. D. Matthews, Sir Henry Pellatt, Lord Strathcona, Sir Wm. C. Van Horne, F. L. Wanklyn, E. R. Wood and M. Workman.

Dominion Iron and Steel Co., Ltd.—President, J. H. Plummer; Vice President, W. McMaster; other directors, Sir Montagu Allan, G. Caverhill, Hon. G. A. Cox, Hon. R. Dandurand, Hon. R. Mackay, Hon. D. McKeen, F. Nicholls, Elias Rogers, W. G. Ross, Sir Wm. C. Van Horne J. R. Wilson, E. R. Wood and M. Workman.

Transportation Conventions in 1912.

July 9.—American Railway Tool Foremen's Association, Chicago, Ill.

July 23-26.—International Railway General Foremen's Association, Chicago, Ill.

Aug. 15.—International Railroad Master Blacksmiths' Association, Chicago, Ill.

Aug.—Travelling Engineers' Association.

Sept. 9.—International Association of Ticket Agents, Muskoka, Ont.

Sept. 10-13.—Roadmasters' and Maintenance of Way Association, Buffalo, N.Y.

Sept. 10-13.—Master Car and Locomotive Painters' Association of United States and Canada, Denver, Col.

Sept. 12.—American Association of General Passenger and Ticket Agents, Seattle, Wash.

Oct.—American Railway Bridge and Building Association, Baltimore, Md.

Oct. 7-11.—Association of Transportation and Car Accounting Officers, Chicago, Ill.

Oct. 7-11.—American Electric Railway Association, Chicago, Ill.

Oct. 8-9.—Canadian Ticket Agents' Association, Ottawa, Ont.

Oct. 15-17.—American Railway Bridge and Building Association, Baltimore, Md.

Oct. 17-19.—American Association of Dining Car Superintendents, Denver, Col.

Oct. 23-25.—Society of Railway Financial Officers, Atlantic City, N.J.

Nov. 6-10.—Association of Railway Electrical Engineers, Chicago, Ill.

Nov. 15.—American Railway Association, Chicago, Ill.

Nov. 15-16.—American Association of Freight Traffic Officers, Chicago, Ill.

Nov. 19-21.—Maintenance of Way Master Painters' Association, Chicago, Ill.

Dec. 12-13.—Association of Transportation and Car Accounting Officers, Louisville, Ky.

Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time, we wish our readers to distinctly understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

The Canadian Locomotive Co., Kingston, Ont., has increased its output from five locomotives a month to eight, and by the end of this year will be able to turn out 15 to 18 a month.

The American Vanadium Co. and its associated companies, also the Flannery Bolt Co., have moved their offices to the Vanadium Building, Forbes and Meyran Avenues, Pittsburgh, Pa.

The Nova Scotia Steel and Coal Co. now employs at its Trenton works, near New Glasgow, 1,100 men, their wages aggregating over $500,000 a year. Its output of finished steel is 26,000 tons a year.

The Canadian H. W. Johns-Manville Co. has moved its Winnipeg office, to 92 Arthur St. The building 100 by 50 ft., six stories and basement, will be occupied solely by the company's staff, which is being increased, and for carrying stock.

The Safety Car Heating and Lighting Co's monthly publication, Safety Heating and Lighting News, for June, contains a number of illustrations of the company's exhibit at the Alantic City conventions, with detailed descriptions of its various types of heating and lighting equipment.

Jacobs and Davies, Inc., consulting engineers, New York and London, Eng., have opened an office at 263 St. James St., Montreal, for the practice of general consulting and construction engineering, under the management of Paul Seurot, M. Am. Soc. C.E., as Canadian representative.

The Standard Underground Cable Co. of Canada, Ltd., has recently established a plant in Hamilton, Ont., where it has a site 400 x 600 ft., on which it has erected a three story brick and structural iron building 335 x 64 ft.; two one story saw tooth buildings 224 by 60 and 250 by 60 ft.; two one story buildings 90 by 6464 and 70 by 30 ft., an office building and some small buildings, the buildings and their equipment representing, we are advised, an investment of $500,000. The company manufactures electric wires and cables of all kinds for electric railway, light, power, signal, telephone, telegraph, fire alarm, and any other service involving transmission of electric current by underground, aerial or submarine circuits. These products also include cable accessories such as terminals and junction boxes, insulating materials, cable splicing tubes, hangers, etc.

The company's officers are:—President, J. W. Marsh; Vice President and Manufacturer, W. A. Conner; Vice President and General Sales Manager, P. H. W. Smith; Secretary and Sales Manager, W. H. Marsh; Treasurer, F. A. Rinehart; Assistant to Sales Manager, H. G. Burd. W. H. Marsh has been connected with the Standard Underground Cable Co. of Pittsburgh, Pa., as Superintendent of Construction for the past 10 years, and H. G. Burd has also been connected with that company as sales engineer in the New York office. The parent company began business in Pittsburgh in 1882 and now has also plants at Perth Amboy, N.J., and Oakland, Cal., with a total floor space of over 12 acres.

NOTICE TO CONTRACTORS.

TENDERS will be received by the undersigned for the substructures and superstructures of ten (10) bridges over the Fraser, Thompson and North Thompson Rivers on that section of the Canadian Northern Pacific Railway between Port Mann and the Yellowhead Pass, Province of British Columbia.

Tenders are to include any or all portions of the construction or the delivery of metal work only.

Detailed drawings, specifications, and forms of contract may be obtained on or after June 5th, 1912, at the office of the Consulting Engineers, Waddell & Harrington, Winch Building, Vancouver, B.C., upon the payment therefor of fifty (50) dollars. This amount will be refunded to those who bid on the work, upon the return of the bidding papers in good condition.

Total work to be completed before June 1st, 1913.

Tenders to be received at the offices of the undersigned, Metropolitan Building, Vancouver, B.C., not later than noon of July 8th, 1912, and to be enclosed in sealed envelopes marked "Tender for Bridge Construction."

The lowest or any tender not necessarily accepted.

MACKENZIE, MANN & COMPANY, LTD.

POSITION WANTED.

Technical Graduate, experienced in all classes of freight and passenger equipment in plant office and engineering, will make permanent change to company offering good opening. Apply box 117 S., The Railway and Marine World, Toronto.

POSITION WANTED

Superintendent or Master Car Builder open for position. Thoroughly familiar with all branches of car building and general mechanical industries; young, active, practical, with executive ability. Good references. Apply box 5880, The Railway and Marine World, Toronto.

Department of Railways and Canals, Canada

HUDSON BAY RAILWAY.

Notice to Contractors.

SEALED TENDERS addressed to the undersigned and endorsed "Tender for construction of Hudson Bay Railway" will be received at this office, until 16 o'clock, on Thursday, the 1st of August, for a section of about 68 miles from Thicket Portage to Split Lake Junction.

Plans, specifications and form of contract to be entered into can be seen on and after Friday, June 7th, at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, and at the office of the Chief Engineer of the Hudson Bay Railway, Winnipeg, at which places forms of tender may be obtained.

Parties tendering will be required to accept the fair wages schedule prepared or to be prepared by the Department of Labor, which schedule will form part of the contract.

Contractors are requested to bear in mind, that tenders will not be considered, unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $150,000.00 made payable to the order of the Minister of Railways and Canals, must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work, at the rates stated in the offer submitted.

The cheques thus sent in will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security, for the due fulfilment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,

L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, 7th June, 1912.

Newspapers inserting this advertisement without authority from the Department will not be paid for it.—23884.

NAVAL SERVICE OF CANADA

Sale by Tender of Steamer "KESTREL."

SEALED TENDERS addressed to the undersigned and accompanied by a certified cheque for $500 will be received up to noon on Wednesday the third day of July, 1912, for the purchase of the Canadian Government steamer "Kestrel" lately employed in Fishery Protection duties on the British Columbia coast and now lying at H.M.C. Dockyard, Esquimalt, B.C.

Forms of tender, conditions of sale, full particulars of the steamer and permission to inspect her may be obtained on application from the Officer in charge, H.M.C. Dockyard, Esquimalt, B.C.

Unauthorized publication of this advertisement will not be paid for.

G. J. DESBARATS,
Deputy Minister.

Department of the Naval Service,
—22725. Ottawa, May 3rd, 1912.

CRANES AND HOISTS

NORTHERN CRANE WORKS, Limited
Walkerville, Ontario.

THE POSITIVE LOCK WASHER
Is the BEST Nut LOCK for all purposes

We also make plain coils and tail nut locks.
The Positive Lock Washer Co.
Sole Mfrs., Newark, N.J.
F.H. HOPKINS & CO., Agts., Montreal

Car Closets
FLUSH OR DRY
DUNER CO. 101 S. Clinton St. Chicago

CREO

CHICAGO RAILWAY EQUIPMENT CO.

Our "PC Creco" Brake Beams are for use on new heavy steel passenger equipment and withstand a load of 40,000 lbs. with 1-16 in. deflection. Greater capacity if desired, without increase in Diamond Special depth of strut or change of adjustable brake head.

CANADIAN OFFICE, 22 ST. JOHN STREET, MONTREAL.

CREO

THE ALGOMA STEEL CO., LIMITED
SAULT STE. MARIE, ONTARIO

IS NOW BOOKING ORDERS FOR STEEL RAILS FOR DELIVERY DURING THE SEASON OF 1912

Parties intending purchasing will find it to their interest to let us have their specifications at an early date so as to insure desired deliveries.

Office:
MARK FISHER BUILDING
MONTREAL

DRUMMOND, McCALL & CO.
GENERAL SALES AGENTS

BUDA JACKS

Motor, Hand and Push Cars

UNEXCELLED—Sold on their merits.
Don't buy before seeing **BUDA.**

Address us for full particulars. Sales Agents

DOMINION EQUIPMENT & SUPPLY CO.

45 and 46 Canada Life Building, WINNIPEG, Man.

KEEP STANDING

Wire Rope

We manufacture and carry in stock all sizes and lengths of wire rope. Wire Rope suitable for Hoisting, Haulage Guys, Towing, Dredges, Transmission of Power, Grain Shovels. Switch Ropes, Derricks, Wrecking Cranes, Elevators, Bridges, Ballast Unloaders, Etc.

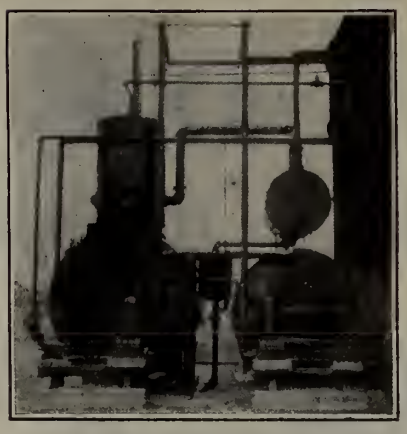
We manufacture special ropes to suit any requirements.

We carry in stock Blocks, Clips, Thimbles, Hooks, Turnbuckles, Shackles, Etc.

OUR NEW CATALOGUE

Our new Catalogue, which illustrates and lists all kinds of wire rope is now ready for distribution. We will gladly mail copy upon request to any interested party. Drop us a line at once as this catalogue will prove useful.

THE DOMINION **WIRE ROPE** CO., LIMITED, Montreal.



"NATIONAL"

We are installers of the latest and most up-to-date Automatic Boiler Washing Plants for Railroad use.

"NATIONAL"

We are installers of all classes of heating systems in Roundhouses, Machine Shops and Industrial Plants.

The above Plant is a duplicate of one we installed in the Canadian Northern Railway Company's Roundhouse, Winnipeg, Man.

This plant handles from Twenty-four to Twenty-eight Locomotives per day.

THE GREATEST SAVER AND DIVIDEND PAYER TO THE RAILROADS.

Submit your requirements fully. It will result in your entire satisfaction.

THE NATIONAL BOILER WASHING CO., LIMITED

Imperial Bank Building, - MONTREAL, Que.

1 a burning hour 100 candle power 1

Pintsch Mantle Light

THE SAFETY CAR HEATING AND LIGHTING COMPANY

2 RECTOR STREET, NEW YORK

718 TRANSPORTATION BLDG., MONTREAL

The Stuffy Sleeping Car Problem Solved

In 1785 Van Marum observed that oxygen gas through which an electric spark had been passed possessed a peculiar smell and at once tarnished a bright surface by mercury, but it was not until the year 1840 that the attention was again called to this fact by Schonbein. This celebrated chemist showed that the peculiar strong-smelling substance, to which he gave the name of ozone, was capable of liberating iodine from potassium iodide and of effecting many other oxydizing actions.

Researches, however, conducted with the greatest care, have shown that ozone is nothing more than concentrated oxygen. As the ozone exists naturally in the atmosphere, it has been rightly designated nature's disinfectant, and possessing this extraordinary advantage over all other disinfectants, that, while destroying the deleterious matter or organisms in the atmosphere, it imparts at the same time to the air certain positive properties, rendering it more healthful and invigorating for respiration.

Ozone is possessed of a very powerful and penetrating odor and very slight traces of this gas can be readily detected by the sense of smell. It has the power of oxydizing or destroying any offensive germs which the air may contain, and it is the most powerful oxydizer known.

The ozonair system of ventilation consists briefly of withdrawing the air supply from as clean and pure a source as possible and removing the smuts and other solid floating matter by means of a filtering screen. The clean air is then passed into a mixing chamber where it is purified and partially sterlized by means of ozone. From the chamber it is distributed by means of ducts to the various parts of the car.

The method of treatment imparts an artificial sense of coolness to the atmosphere, which is most refreshing in the hot weather. The distribution is scientific and practical. Draughts are avoided, and the amount of air and also the strength of the added ozone can be adjusted at will, so that the atmosphere in the car can be varied at any time. No complicated plant is required, the whole working is automatic and depends on the manipulation of two or three ordinary electric switches.

Write for Ozonair Booklet.

F. NICOLAS & COMPANY, LTD.

Head Offices : 119 & 167 Bleury Street, - MONTREAL, QUE.

All Steel Drop Bottom Gondola Cars

80,000 LBS. CAPACITY

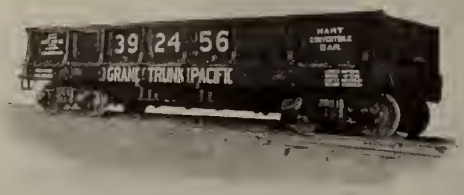
GOOD AS NEW IMMEDIATE SHIPMENT

SEND FOR PRICES AND DETAILED SPECIFICATIONS

CANADIAN EQUIPMENT COMPANY, Limited

TRANSPORTATION BUILDING

MONTREAL



"Hart" Convertible Cars

are being used extensively by

Railroads and Contractors

Our "Hart" Cars can be used as follows :

Centre Dump Ballast Cars, Side Dump Construction Cars, Side Door Gondola Cars.

Capacities 30 to 50 tons. All Wood, All Steel or Composite Construction.

"Otis" Dump Cars

Can be used in a variety of services.

For Coal, Coke, Ore and General Service.

All capacities. All Wood or All Steel, also Composite Construction.

We would like to mail you booklet, illustrating and describing these cars in operation under all sorts of conditions.

THE HART-OTIS CAR CO., LIMITED

MONTREAL.

Norton's Improved

HIGH SPEED JACKS

They lift and lower their full rated capacity **Four Times** as fast as other Ball Bearing Jacks of equal capacity.

All Crucible Steel, light and strong.

Send for complete catalogue and Discount

35 and 50 Tons capacity. Plain and foot lift.

Made in Canada by

A. O. NORTON, Inc., COATICOOK, QUE.

Stock Carried by Canadian Agents: MUSSENS LIMITED

Montreal Toronto Winnipeg Cobalt Calgary Vancouver

New 22 lbs STREET CAR BRAKESHOE. Old 3 lbs

Our Improved Reinforced BRAKESHOES

KEEP STANDING

Are suitable for all classes of Electric and Steam Railways and Street Cars. They are fitted with an improved attaching lug which can be made of any desired thickness to suit the class of service, and requires no re-inforcing for retaining it in position and cannot be detached from the Steel Back.

They have an even co-efficient of friction throughout their whole life and a greater percentage of this shoe can be worn out than any other make of shoe on the market.

We stock all standard Brakeshoes suitable for Christy heads, etc.

We contract on a guaranteed saving on your present aggregate cost.

Let us submit you further particulars. Patents applied for in all countries.

Canadian Brakeshoe Company, Limited

SHERBROOKE, Que.

CRANES

"Industrial"

Wrecking, Locomotive and Coaling Cranes

In Capacities of from Five to One Hundred and Twenty Tons.
For use about

Railroads, Manufacturing Plants, Coaling Stations, Quarries.

Let us send you our Catalogue.

SOLE CANADIAN REPRESENTATIVES

F·H·Hopkins & Co MONTREAL, QUE.

BRANCHES:
General Supply Co., Limited Winnipeg, Man.
Ritchie Contractors' Supply Co., Vancouver, B.C.

PHYSICAL PROPERTIES

Elastic Limit	75,000 lbs.
Tensile Strength	100,000 lbs.
Elongation in 2″	20%
Reduction in area	50%

VANADIUM

The Steel of Ultimate Quality

ELASTICITY STRENGTH TOUGHNESS ENDURANCE

Vanadium is the only element that greatly increases the elastic limit and dynamic strength of steel without impairing its ductility.

OVER 2,000 VANADIUM STEEL DRIVING AXLES IN SERVICE

in the fastest passenger, and heaviest freight locomotives.

Booklets and expert advice on application.

"Amervan" and "Masvan" Ferro Vanadium are the Standard Alloys for making Vanadium Steel.

CHANGE

American Vanadium Co.

Largest Manufacturers of Vanadium Alloys in the World
Immediate Shipment any Quantity

324 Vanadium Bldg., PITTSBURGH, PA.

London Paris Pittsburgh

The Light of Day on The Right of Way

TRADE COMMERCIAL STORED SUNLIGHT ACETYLENE MARK.

LITERATURE ON REQUEST

HEADLIGHTS

S. M. P. Writes:

"Locomotives equipped with your type acetylene headlight have been in service quite a period, affording excellent light and cost of maintenance most satisfactory."

CAR LIGHTING

Standard Tank Supplies Several Weeks Lighting

SIGNALS

Small Tank Supplies 112 Days Continuous Burning

ECONOMICAL EFFICIENT

The Commercial Acetylene Co.

6 King St. West, Toronto
New York, Atlanta, San Francisco, Boston, Chicago

LOCOMOTIVES

FOR ALL CLASSES OF SERVICE

VULCAN IRON WORKS

WILKES-BARRE, PA., U.S.A.

Canadian Representatives - MUSSENS LIMITED, MONTREAL
New York Office - - - - 50 Church St.

EDISON BSCO PRIMARY BATTERY

The standard closed circuit cell.

When the demand for a commodity is constantly growing, public confidence is naturally strengthened, and the loss of popularity has the opposite effect.

Some special feature or clever advertising will often bring a product momentarily to the front, but only genuine merit will keep it there.

The production and sale of Edison Primary Batteries is constantly increasing, each year's record showing an improvement over the previous one.

A condition of this kind is gratifying in any line, but particularly so in the case of a primary battery, which is literally under inspection every hour of the twenty-four, day in and day out.

The confidence thus indicated is proof that the battery-using public appreciates the efforts of the manufacturer to make every cell or element, that leaves the works, of such character that it can be depended upon to furnish 100% efficiency.

In adopting the Edison BSCO cell as standard, you are assured of obtaining material of the highest grade, are benefited by the results of research work, constantly under way in a laboratory, which, for the purpose, has no equal, and share with us the value of the experience gained through our being the largest producers of this type of cell.

The cheapest form of Primary Battery energy.

Thomas A. Edison, Inc.
262 Lakeside Ave., Orange, N.J., U.S.A.

New Catalog No. 12

JUST ISSUED

Handsome cloth bound book of 490 pages, containing DETAILED DATA relative to devices listed that is not usually contained in catalogs :

TABLE OF CONTENTS:

Catenary Material	Third Rail Insulators
1,500 Volt D.C. Material	Car Equipment Specialties
750 Volt Overhead Material	Hi-Tension Porcelain Insulators
All Wire Rail Bonds and Tools	Insulator Hardware

Copy sent post paid on request to anyone connected with the Operating, Construction, Engineering or Purchasing Departments of Electric Railways or Transmission Companies. Please mention this advertisement.

The Ohio Brass Co., Mansfield, Ohio

TIE PLATES

A Sellers Anchor Bottom Tie Plate and Cedar Tie after 10 years service on a 4 degree curve under heavy mainline traffic.

No modern road can afford to use old style flanged tie plates. They damage the tie and shorten its life.

Sellers Anchor Bottom Tie Plates have 30% greater holding power and preserve the tie. They compress the fibre of the wood and exclude moistures from underneath the plate.

Sellers Anchor Bottom Tie Plate Co.
of Canada, Limited
CORISTINE BUILDING, MONTREAL

Synopsis of Dominion Land Regulations.

Any person who is the sole head of a family, or any male over 18 years old, may homestead a quarter section of available Dominion land in Manitoba, Saskatchewan or Alberta. The applicant must appear in person at the Dominion Lands Agency or Subagency for the district. Entry by proxy may be made at any agency, on certain conditions by father, mother, son, daughter, brother or sister of intending homesteader.

Duties.—Six months' residence upon and cultivation of the land in each of three years. A homesteader may live within nine miles of his homestead on a farm of at least 80 acres solely owned and occupied by him or by his father, mother, son, daughter, brother or sister.

In certain districts a homesteader in good standing may pre-empt a quarter-section alongside his homestead. Price, $3.00 per acre.

Duties.—Must reside upon the homestead or pre-emption six months in each of six years from date of homestead entry (including the time required to earn homestead patent) and cultivate fifty acres extra.

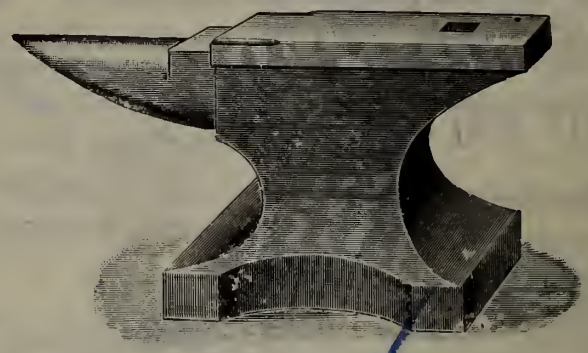
A homesteader who has exhausted his homestead right and cannot obtain a preemption may enter for a purchased homestead in certain districts. Price, $3.00 per acre. Duties.—Must reside six months in each of three years, cultivate fifty acres and erect a house worth $300.00.

W. W. CORY,

Deputy of the Minister of the Interior.

N.B.—Unauthorized publication of this advertisement will not be paid for.

Steel Castings



From 60 to 700 lbs. in stock.
Larger sizes made to order.

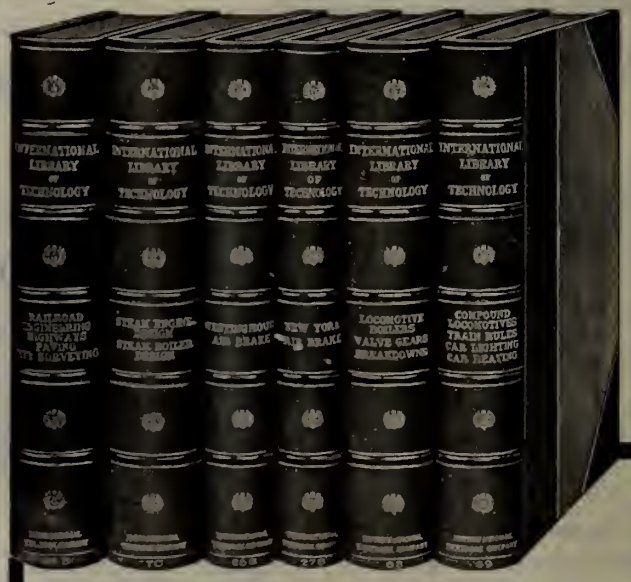
We manufacture all classes of steel castings.

Anvils of solid steel with special tempered face.

Absolute satisfaction guaranteed.

JOLIETTE STEEL AND IRON FOUNDRY CO., LTD.

Office and Foundry, JOLIETTE, P.Q.



YOU Need This Railroad Library

—a library that will give you the best up-to-date modern practice. There is no other reference work in the world that so completely meets the needs of the railroad man as the INTERNATIONAL RAILROAD LIBRARY. This is an epitome of the years of experience of the best railroad experts in the country edited in a style that 18 years of experience in publishing home-study textbooks has proved the easiest to learn, to remember, and to apply. The volumes of this library are a part of a series of textbooks that cost $1,500,000 to prepare. They are recommended by the highest authorities and are used in nearly all our leading universities and colleges. Not only can they be used to great advantage by superintendents, railroad officials, foremen, engineers, firemen, conductors, and brakemen as an authoritative guide in their work, but since they can be so clearly understood even by persons having no knowledge of higher mathematics, they can be used by all classes of railroad employes that are desirous of advancing to higher positions. Write for catalog **now.**

INTERNATIONAL TEXTBOOK COMPANY

Box 1072, Scranton, Pa.

Save Fuel—Increase Mileage—Improve Service

By the use of Dearborn Treatment. It costs but a few cents per thousand gallons—less than any other method of water treatment.

The Treatment loosens up old scale, so that it is easily washed out, and prevents new formation. No scale in boilers means great saving in fuel, and engine can make greater mileage per boiler washing.

Leaking troubles are done away with, and expense for boiler work reduced to the minimum. The average life of a set of locomotive boiler tubes in bad water districts can be increased 200 to 400 per cent.

Dearborn Treatment is made to suit actual conditions on division, shown by analyses of waters. Gallon Samples required.

KEEP STANDING

DEARBORN DRUG & CHEMICAL WORKS

McCORMICK BUILDING, - CHICAGO

Thor

THE WORLD'S GREATEST AIR TOOLS

PISTON AIR DRILLS

ARE GUARANTEED 30% MORE EFFICIENT THAN ANY OTHER MAKE.

They have the *Corliss Valve Motion,* conceded by Engineers to be the greatest valve mechanism used in any air drill. Are equipped with *Telescopic Screw Feed,* allowing for the longest range in drilling. Are made in all capacities suitable for drilling, tapping, reaming, rolling flues, wood boring, stay-bolt work and close corner work.

Don't fail to give these machines a trial. Write for circular G and our proposition before placing your order.

INDEPENDENT PNEUMATIC TOOL COMPANY

CHICAGO NEW YORK

FOR SALE IN CANADA BY

H. W. PETRIE, LTD. { Toronto, Ont. Montreal, Que. Vancouver, B.C.

SUMMER TIME TABLE, JUNE 2nd.

Intercolonial Railway, OCEAN LIMITED

Will leave MONTREAL 7.30 P.M. DAILY

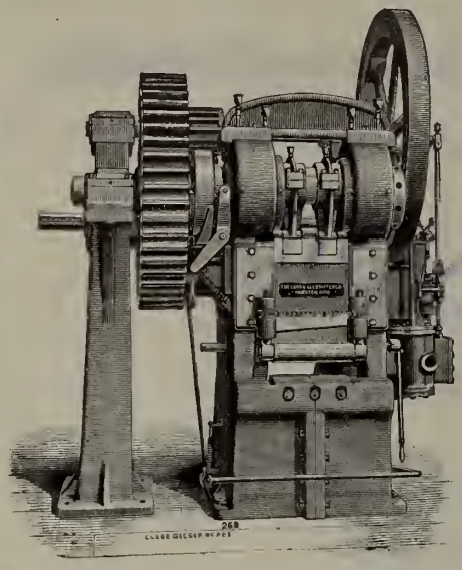
For Quebec, Lower St. Lawrence Resorts, Moncton, Halifax

Direct connection for St. John, N.B., The Sydneys, Prince Edward Island, Newfoundland (except by Ocean Limited, leaving Montreal Saturday).

MARITIME EXPRESS

Will leave Montreal 8.15 a.m. (daily, except Saturday), for Maritime Provinces.

Grand Trunk trains for Montreal make direct connection at Bonaventure Union Depot, Montreal.



Gate Shear—Steam-Driven

POWER PUNCHING & SHEARING MACHINERY

Over 350 sizes and styles for all kinds of light and heavy work designed and manufactured by

THE LONG & ALLSTATTER CO.

Hamilton, Ohio, U.S.A.

Riveting Machines Tire Welding Machines

Armature Disc Notching Machines

Tire Bending Rolls Beam Coping Machines

Bending and Forming Machines

Write for Catalogue if interested. Correspondence invited.

——TOOLS FOR ALL PURPOSES——

We carry the Largest and Best Assorted Stock of Tools in Canada, and Mechanics will find every new idea in the tool trade shown in our stock. We name below a few of our lines:

Wiley & Russel, Stocks, Dies, Taps, Etc.

Butterfield, Stocks, Dies, Taps, Etc.

Oster, Stocks and Dies

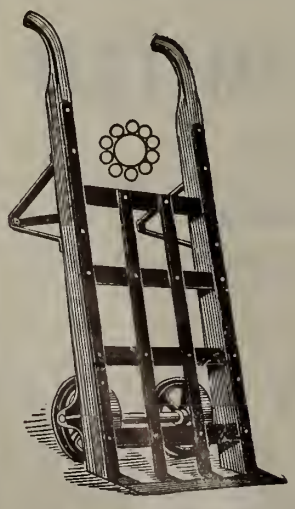
Starret's Fine Tools

Brown and Sharp's Fine Tools

Western Tool Co.'s Lathe, Planer, and Shaper Tools

We cordially invite all interested in Tools to come in and view our stock. We will gladly demonstrate any of our lines.

Rice Lewis & Son, Limited - Toronto



For Railroad and Steamboat

The Corbet Roller Bearing Truck

IS USED BY

The Canadian Pacific Railway

And Other Large Companies

This truck has many **SPECIAL** features over the old style, and is made Strong and Heavy, to withstand the abuse to which it is subject.

The Roller Bearings reduce friction to a minimum, thereby **Doubling** the **Life** of the **Truck.**

Purchasing Agents will consult their own interests by having this **Truck** in their Freight Sheds.

Write for Illustrated Catalogue to

The Corbet Foundry & Machine Co., Limited

OWEN SOUND - - - - ONTARIO

"Little Giant" New Ratchet Close Quarter Drill

Made in two sizes. Capacities 1¼" and 2" in Iron or Steel.

MANUFACTURED BY

Chicago Pneumatic Tool Company

SOLE AGENTS FOR CANADA

THE HOLDEN COMPANY, LIMITED

354-356 St. James St., MONTREAL.

42 York Street, TORONTO, Ont.
150 Princess Street, WINNIPEG, Man.
429 Pender Street West, VANCOUVER, B.C.

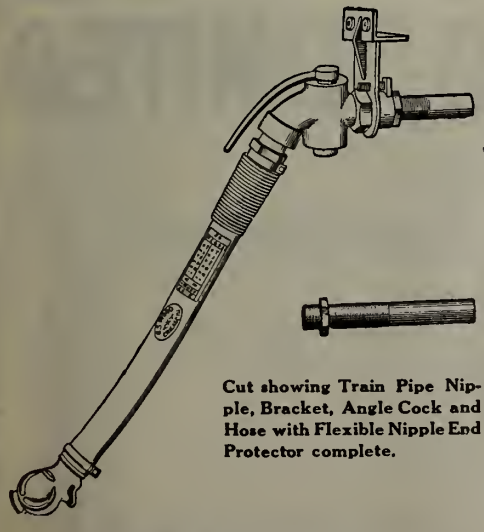
The James Robertson Company, Limited

MONTREAL TORONTO WINNIPEG ST. JOHN

OUR BRASS FOUNDRY IS UP-TO-DATE

We Cast in ALUMINUM, BRONZE, BRASS, PHOSPHOR BRONZE, or any specified alloy you may desire. You supply the patterns. We do the casting.

WE SOLICIT YOUR ENQUIRIES



Cut showing Train Pipe Nipple, Bracket, Angle Cock and Hose with Flexible Nipple End Protector complete.

Correspondence Solicited

GUILFORD S. WOOD

RAILWAY NECESSITIES

Great Northern Building - Chicago

WOOD'S FLEXIBLE NIPPLE END PROTECTOR

FOR AIR-BRAKE AND SIGNAL HOSE

Prevents chafing and breaking, effecting a saving of from 40 to 50% in maintenance of air-brake hose.

THE MONOGRAM BRACKET

will absolutely stop shifting and leaking of air-brake train pipes. All M.C.B. requirements are obtained and maintained.

P. & W. HOSE PRESERVATIVE

FOR AIR-BRAKE AND PNEUMATIC TOOL HOSE

will prevent cracking of rubber cover and deterioration due to climatic changes. Easily applied.

A HISTORY OF THE PAY-AS-YOU-ENTER CAR

AND ITS LESSON

The following cities are using Pay-As-You-Enter Cars: Chicago City Railway, 839 cars; Chicago Railways, 1,328; Public Service Corporation of New Jersey, 466; New York City Railway, 555; Third Avenue Railroad, New York, 550; International Railway, Buffalo, 200; Buffalo & Lake Erie Traction Co., 10; Washington Ry. & Elec. Co., Washington, D.C., 100; Capital Traction Co., Washington, D.C., 51; Municipal Traction Co., Cleveland, Ohio, 180; United Rys. Co. of St. Louis, Missouri, 310; Portland Ry., Lt. & Pwr. Co., Portland, Ore., 25; Columbus Ry. & Lt. Co., Columbus, Ohio, 10; Wichita R.R. & Lt. Co., Wichita, Kan., 14; Jacksonville Elec. Co., Jacksonville, Fla., 5; Dallas Elec. Co., Dallas, Texas, 20; Houston Elec. Co., Houston, Tex., 41; Northern Texas Trac. Co., Ft. Worth, Texas, 25; Ithaca Street Ry., Ithaca, N.Y., 2; Peoria Street Ry., Peoria, Ill., 13; Urbana & Champaign Ry., Champaign, Ill., 3; Mutual Lt. & Water Co., Brunswick, Ga., 4; Rochester Ry. Co., Rochester, N.Y., 25; Ft. Dodge, Des Moines & So. R.R. Co., 2; Muskogee Elec. Trac., Muskogee, Okla., 6; Union Traction Co., Dubuque, Ia., 4; Topeka Ry. Co., Topeka, Kas., 12; United Rys. & Elec. Co., Baltimore, Md., 32; Detroit United Ry., Detroit, Mich., 225; Cincinnati Traction Co., Ohio, 50; Montreal Street Railway, 400; British Columbia Elec. Ry., 30; Calgary Street Railway, 18; Metropolitan Street Ry., Kansas City, Mo., 50; Edmonton Radial Ry., 4; San Antonio Traction Co., San Antonio, Tex., 6; Rockford & Int. Ry., Rockford, Ill.; Cairo Street Ry. & Lt. System, 6; Des Moines City Railway, Iowa, 12; Macon Ry. & Lt. Co., Macon, Ga.; Virginia Ry. & Power Co.; Columbia Elec. St. Ry. & Lt. & Power Co., Columbia, S.C.; Aurora, Elgin & Chicago Ry., Chicago, Ill.; Wichita Falls Traction Co., Wichita Falls, Tex.; Ottawa Electric Ry. Co., Ottawa; Bloomington & Normal Ry. & Lt. Co., Bloomington, Ill.; Corsicana Transit Co., Corsicana, Tex.; Compania Electrica y de Ferrocarriles, Mexico; The Milwaukee Elec. Ry. & Lt. Co., Milwaukee, Wis.; Springfield Street Ry. Co., Springfield, Mass.; Lynchburg Traction Co., Lynchburg, Va.; Chicago & Southern Traction Co., Chicago, Ill.; Calumet & South Chicago Ry. Co., Chicago, Ill.

THE LESSON

taught by this widespread use of Pay-As-You-Enter Cars is obvious. Increased Revenue, Accident Elimination and Schedule Improvement have been demonstrated in every case. Isn't all this sufficient to show that it always pays to operate the Pay-As-You-Enter Car? Why not remodel some of your present cars?

We license manufacturers and railways to build and use the Pay-As-You-Enter Car, the Patents on which are owned by

ROSS & McDONALD, PATENTEES, - - 78 CRAIG STREET WEST, MONTREAL

Northern Navigation Co'y Limited

GRAND TRUNK ROUTE

"A Fresh Water Sea Voyage"

Between Sarnia, S. S. Marie, Port Arthur, Fort William and Duluth.

"That Georgian Bay Trip"

Between Parry Sound, Collingwood, Owen Sound, S. S. Marie, Mackinac Island, and Sarnia.

"Amongst the 3,000 Islands"

Between Penetang and Parry Sound.

Rates and full information from all Railway Agents or the Company at Sarnia, Ont., or Collingwood, Ont.

JAS. W. PYKE & CO., LIMITED

CANADIAN REPRESENTATIVES

FRIED. KRUPP, ESSEN, GERMANY

Steel Rails.
Wrought Iron Steel-Tyred Disc Wheels
Locomotive and Car Wheel Tyres.
Axles, Crank Pins, Forgings, Etc.

FOR STEAM AND ELECTRIC RAILWAYS.

OFFICE: Commercial Union Building, 232 ST. JAMES STREET, MONTREAL

Car Bolster Spring with Pressed Steel Caps

RAILWAY SPRINGS

LOCOMOTIVE, TENDER AND PASSENGER CAR SPRINGS of every description.

EQUALIZING, DRAWBOARD, BUFFER AND SPIRAL SPRINGS of all kinds.

STREET RAILWAY SPRINGS, from the largest to the smallest.

TRACK TOOLS, RAIL BRACES, TIE PLATES, GUY ANCHORS AND RODS, LOCOMOTIVE SANDERS, CHAIN, Etc.

MANUFACTURED BY

B. J. COGHLIN COMPANY, LIMITED

MONTREAL - - CANADA

KEEP STANDING

The Hudson's Bay Company

THE COMPANY OFFERS FOR SALE

Farming and Grazing Lands in Manitoba and the Northwest Territories

ON EASY TERMS OF PAYMENT

Town Lots for Sale at Winnipeg, Ft. William, Edmonton, Prince Albert, etc.

The Company has General Stores at Winnipeg, Vancouver, Calgary, Edmonton, and other places where purchasers will find the best of goods at moderate prices.

Transportation by the Company's Steamers, brigades of boats and canoes throughout the Territories not traversed by railways.

Full information at the Company's Offices, Winnipeg, or 1 Lime St., London, E.C.

The Best Lubricant for Your Machinery is

Helmet OIL

A Solidified Oil—The Consistency of Butter

ABSOLUTELY PURE

NO LIME
NO SOAP
NO ROSIN
NO ACID

Used in all Climates and Seasons.
Insensible to temperatures between −40° and +200° Fahrenheit.
THE BEST FOR FIFTY YEARS—NOTHING ELSE LIKE IT.
INSIST ON THE GENUINE.

Williams & Wilson, Ltd., Agents, Montreal.
H. W. Petrie, Ltd., Agents, Toronto.

CHARLES H. BESLY & CO., CHICAGO U.S.A.

KEEP STANDING

Dominion Coal Company, Limited

Operating Collieries in Cape Breton, and Cumberland Counties, Nova Scotia.
Output 4,500,000 Tons Yearly

DOMINION STEAM AND GAS COALS

Screened, Run of Mine and Slack

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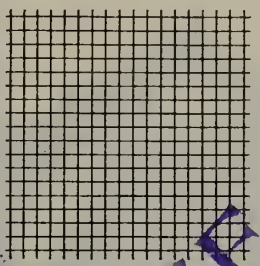

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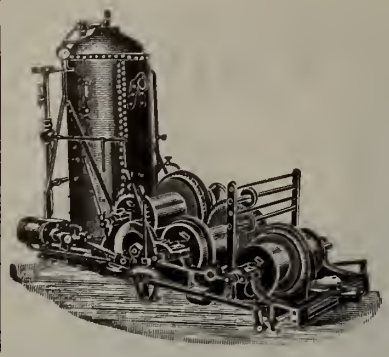

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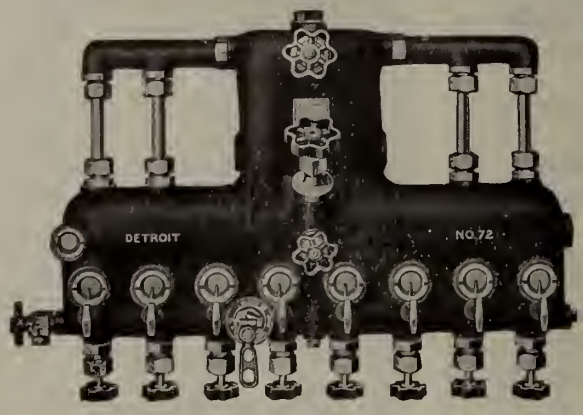

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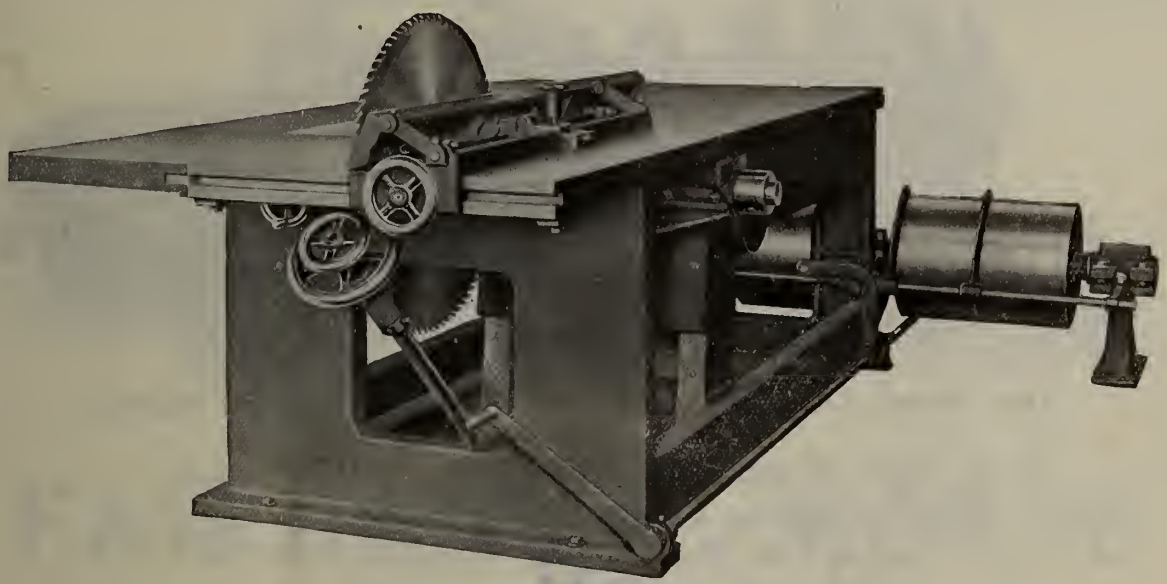

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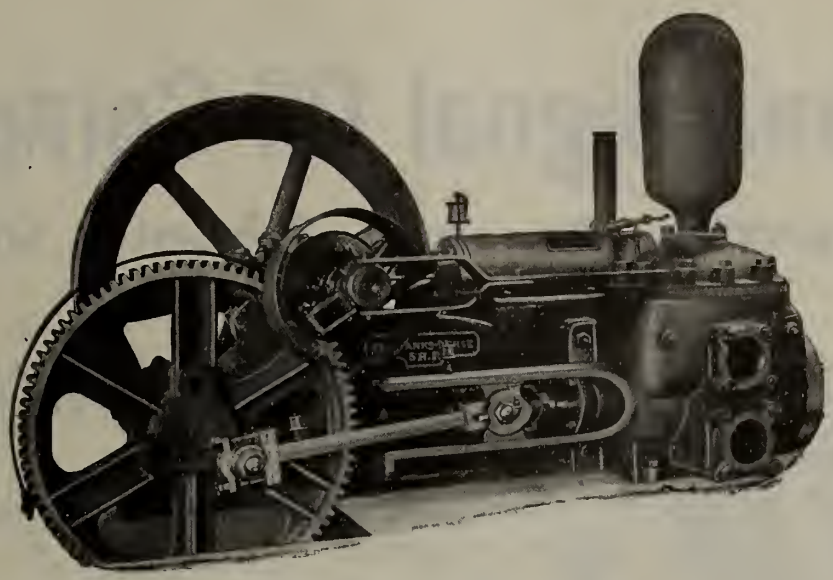

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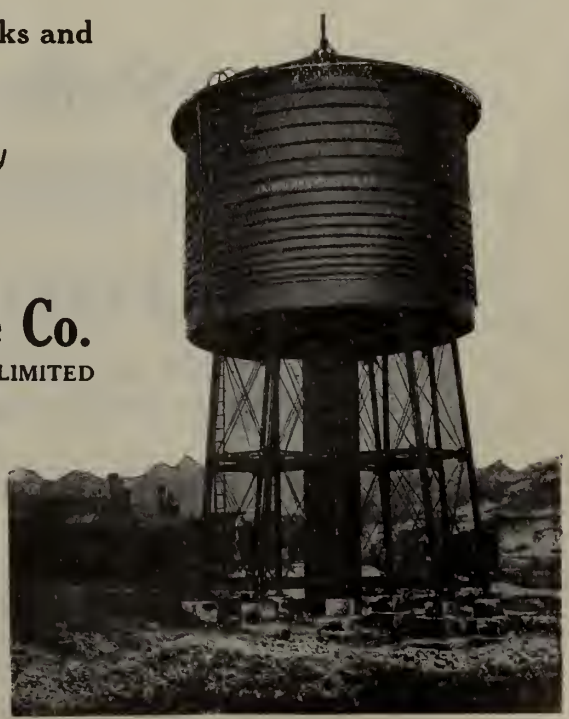

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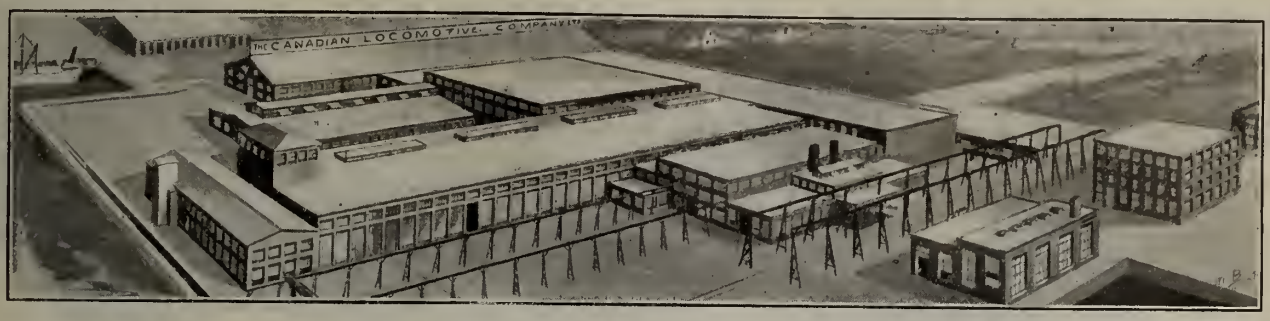

Switching Locomotive built for Intercolonial Railway of Canada.

Total weight of engine in working order	144,000 pounds
Weight on drivers	144,000 pounds
Diameter of drivers	51 inches
Boiler pressure	200 pounds
Cylinders	20 x 26 inches
Maximum tractive power	34,500 pounds

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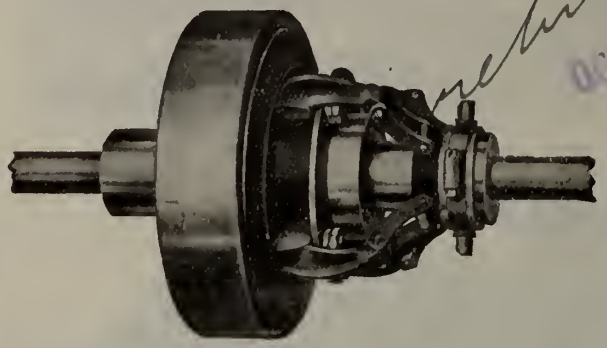

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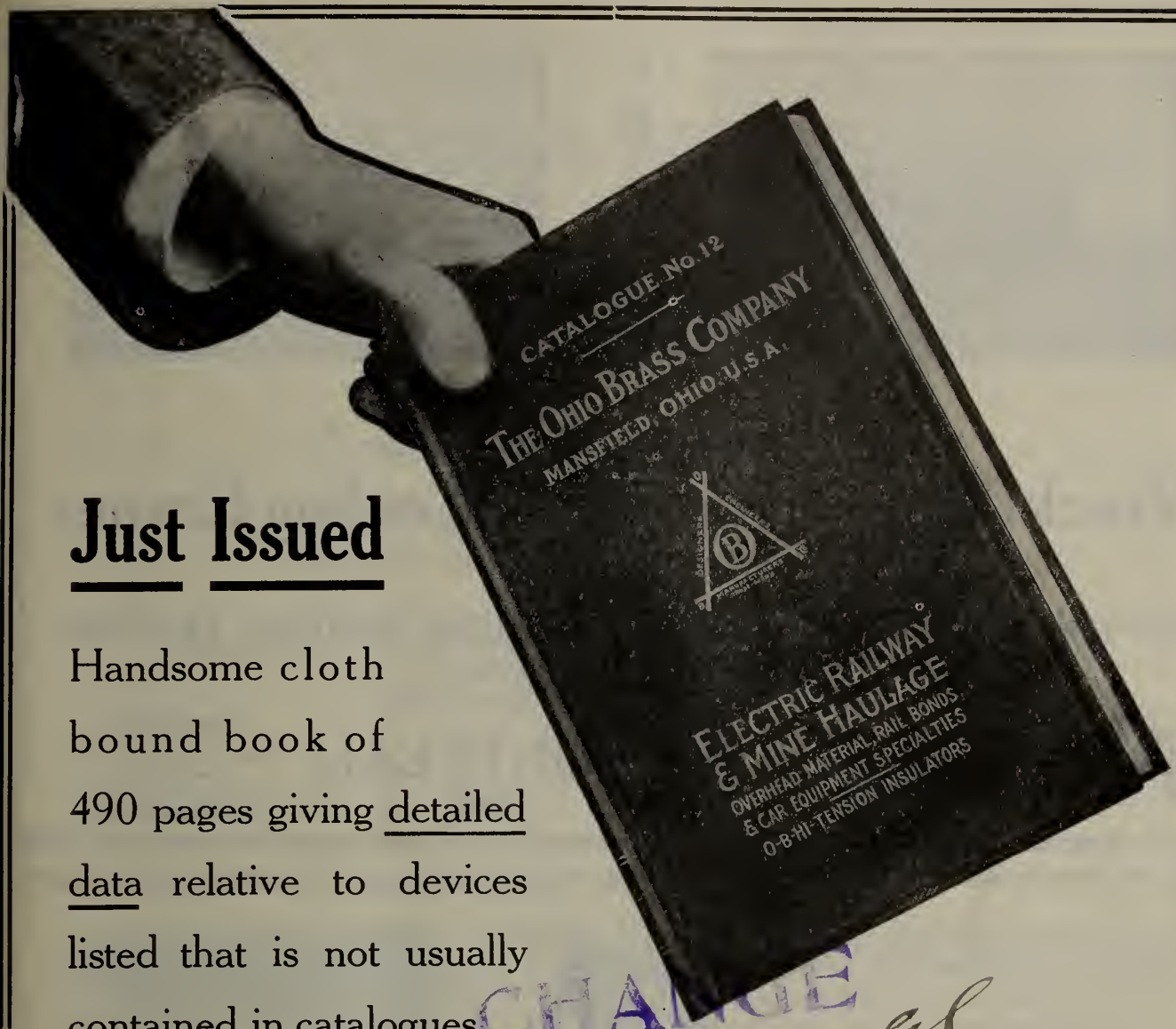

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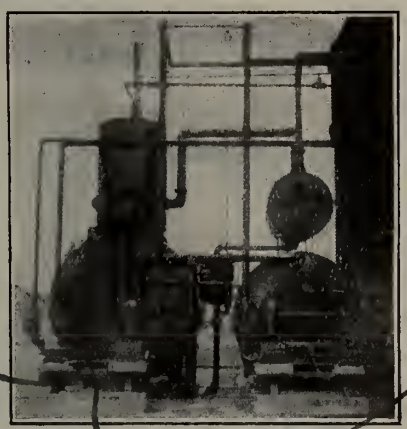

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CHANGE

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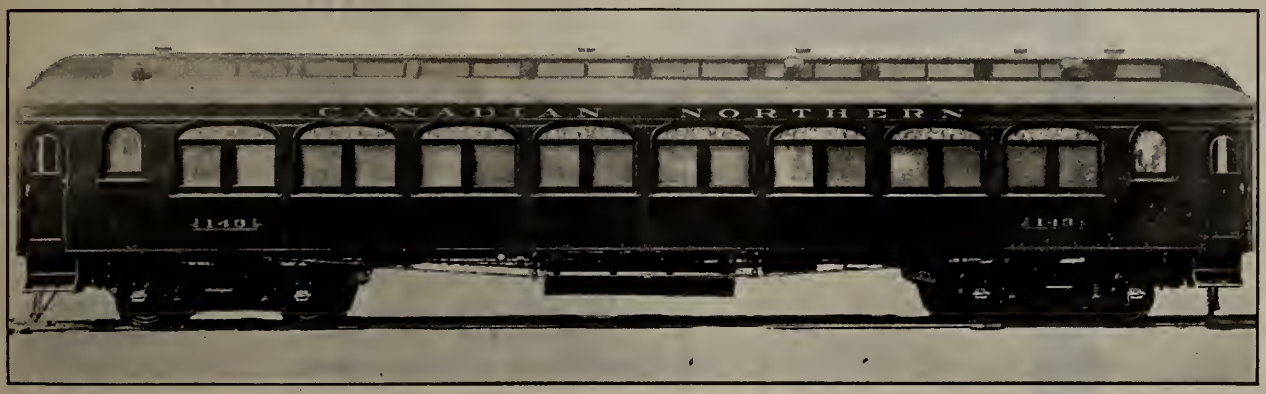

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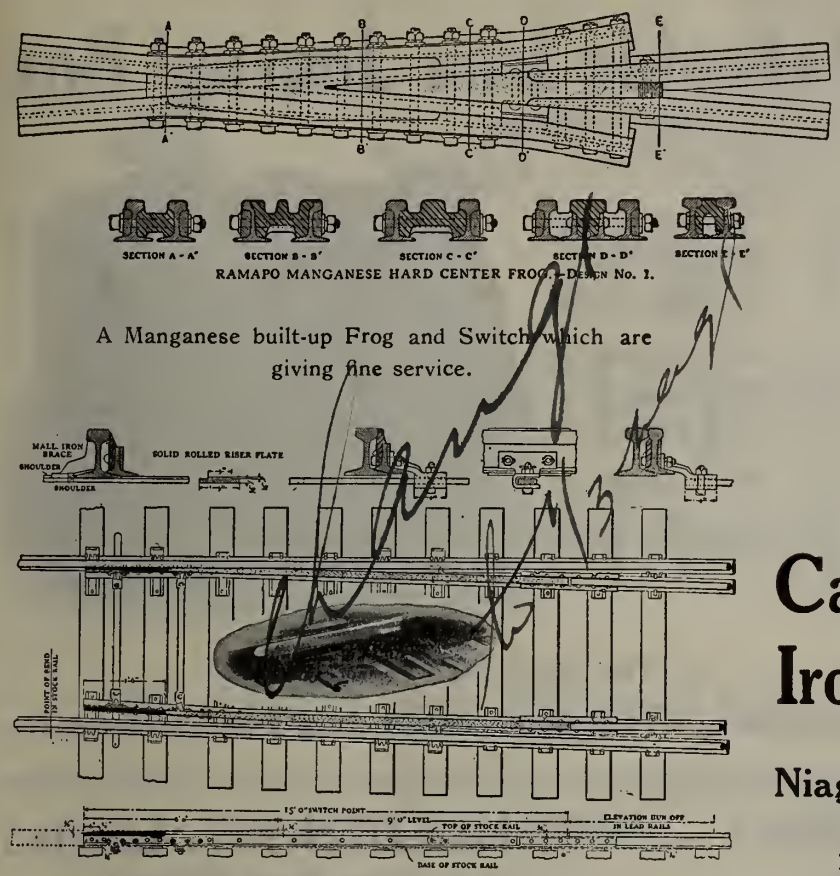

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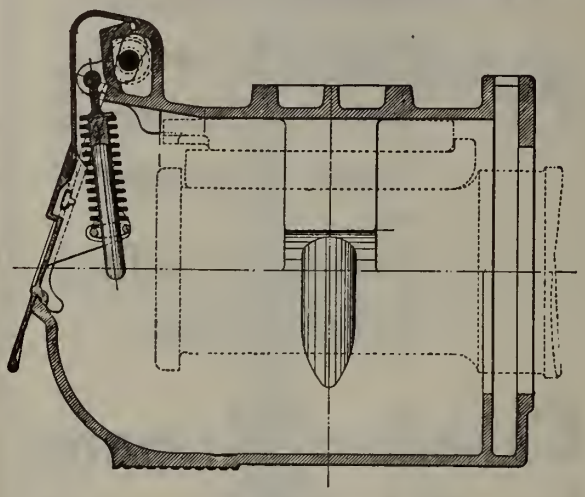

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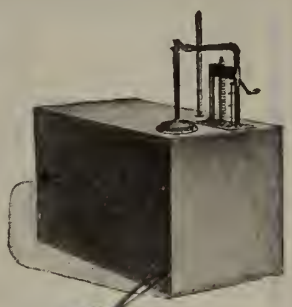

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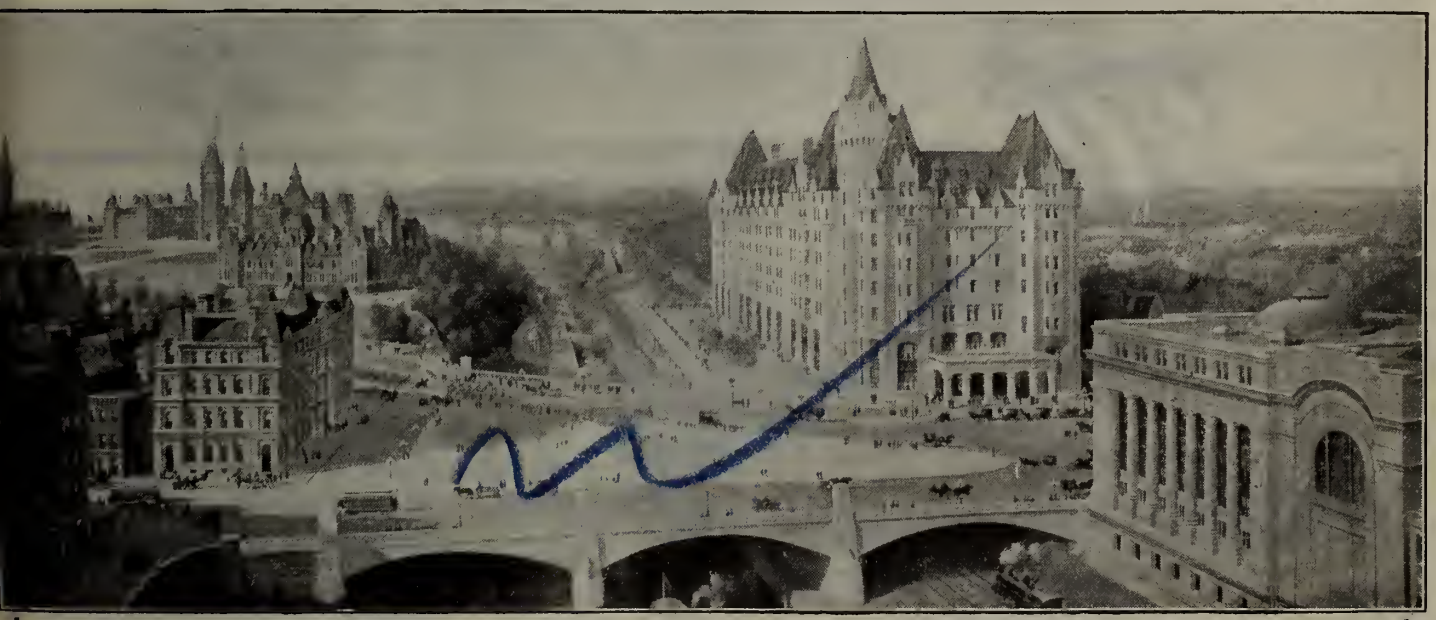

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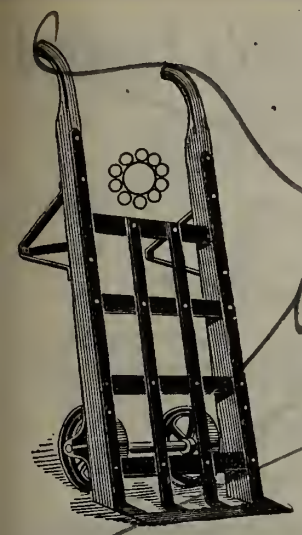

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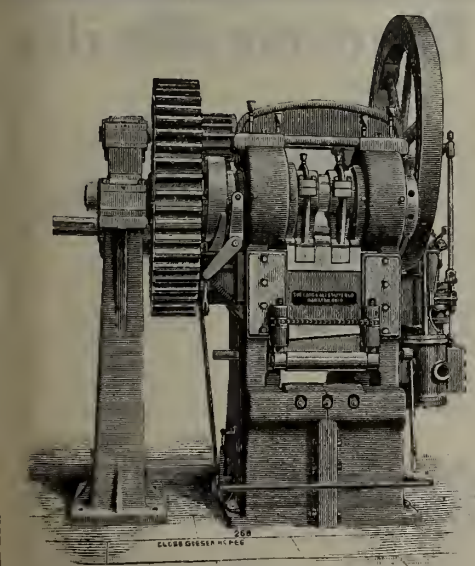

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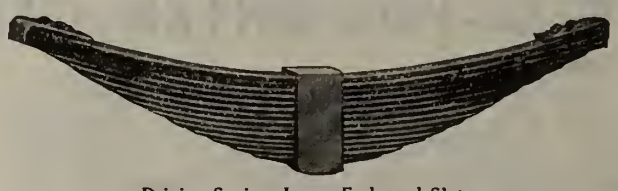

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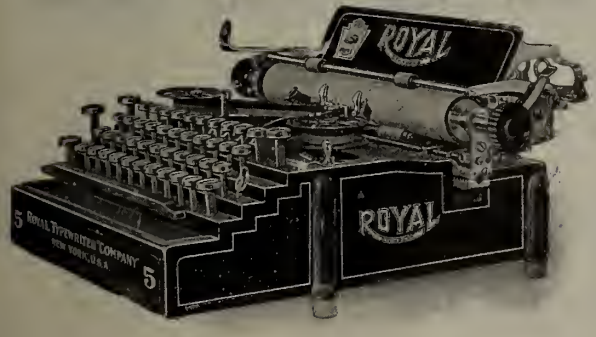

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Canadian Railway and Marine World.

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The Railway Viaduct and New Union Station at Toronto.

The railway viaduct through the lower part of Toronto, with the new union station, both of which were originally ordered by the Board of Railway Commissioners in June, 1909, are now assured and construction will soon be in progress, all the plans for the changes having been completed in a general way and approved by the Board of Railway Commissioners.

The original order of the Board of Railway Commissioners in June, 1909, called for a four-track viaduct from west of John St. to or near Berkley St., with three tracks either side of the viaduct at the present level of the Esplanade, with all necessary crossovers, the centre line of this viaduct to be located on the southern boundary of the Esplanade, this four-track portion of the work to be undertaken conjointly by the G.T.R. and C.P.R. Independent of this, the C.P.R. was ordered to elevate two tracks from the easterly end of the four-track viaduct to near Queen St., with necessary viaducts over certain intervening streets. The corresponding section of the G.T.R. line was also ordered elevated on a two-track viaduct from the same point to Logan Ave., crossing the streets en route on viaducts. All streets were to pass under the tracks with the exception of John St. and Spadina Ave., both of which were to cross the tracks on bridges, to be constructed conjointly by the two railway companies. The city was ordered to pay one-third the cost of the viaduct including the elevation of the C.P.R. passenger car yard and G.T.R. Don sorting yard. The same proportion of the cost of the bridges at Spadina Ave., John St. and Eastern Ave., and the elevation of the substructure under the new Union Station was also ordered to be borne by the city. In addition to these liabilities on the part of the city, no damages can be collected by the latter for any city property taken for the proper carrying out of the scheme. Any question of damages between the two companies is to be reserved for settlement by the Board.

At that time the C.P.R. was contemplating taking at least a large number of its trains into a station to be built in the northern part of the city, and thus get away from the down town trouble. This matter is still under consideration. In view of this desire to take some of its passenger traffic to the north end of the city, the company took exception to its inclusion in the viaduct and union station scheme, and appealed the matter to the Board of Railway Commissioners, which last May ordered the work to be continued under the original order, with an extension of time for the completion of the project, the original two years having already expired. At the same time, the Board approved the G.T.R. plans as the more desirable, and ordered that they be followed instead of the plans for the same proposition supplied by the C.P.R.

The grade separation work at Toronto is divided into two separate portions, parts 1 and 2. Part 1 is the portion that is now nearly completed, stretching from Mimico on the west to the C.P.R. diamond crossing near Strachan Ave. in the city. Progress reports on this work have been made from time to time in these columns, and the issue of May last, contained an illustrated description of the extent of the work and the means by which it was being carried on. This portion of the work was done under a separate order from that relating to part 2 through the centre of the city.

The new profile the line assumes through the city is shown in Fig. 2, and a plan view of the new alignment and trackage arrangement as at present developed is shown in fig. 3, sections 1 to 4. It will be noticed that the work extends from the junction with part 1 at the C.P.R. diamond crossing on the west, to Logan Ave. on the east, where the line again strikes grade. Grade is struck on the C.P.R. line at Eastern Ave.

From the west, the line in part 1 of the work descends on a 0.4% grade until it strikes the junction with part 2 at the C.P.R. diamond crossing, where the downward grade changes to one of 0.25%, the elevation at that point being 24.0. The original down grade from the crossing had a greater slope, so that at Strachan Ave., about 200 ft. from the crossing, the rails have been raised about 2 ft. This small rise has not made the raising of the bridge necessary, although a removal of the old bridge, with a more modern bridge to replace it, is under consideration, only such a move is apart from the viaduct scheme.

The 0.25% down grade continues beyond Bathurst St. This portion of the line in the old roadbed was through a cutting, which will be filled to the required depth, without the use of concrete retaining walls, which are necessary through the greater part of the viaduct length. The new rail level at Bathurst St. will be about 4 ft. above the former level, calling for the raising of the overhead bridge at that point a corresponding 4 ft. The highway from the north will have a small ramp, in place of the present practically level approach from the from the ridge of land along the north side of the railway right of way. The southern approach, at present a long ramp, will be made slightly steeper. The C.P.R. and the old Northern line of the G.T.R., which meet the main line just west of Bathurst St. require a very small fill, as the elevation of this line back from Bathurst St. is higher than the main line from Hamilton. At Strachan Ave., the Northern and C.P.R. lines cross at grade, while the other is in a long cutting as described.

A short distance east of Bathurst St., the line takes to the viaduct, the concrete retaining wall commencing at elevation 14.0. From that point to near Spadina Ave., the line is practically level, where at elevation 15.0 the line ascends on a 0.4% grade. To the north of the four through tracks that are elevated on the viaduct, there are the tracks at grade leading in to the G.T.R. freight yards and shops. It is the intention to leave these tracks as at present until such time as the work is completed, when the whole arrangement of surface tracks will be changed to better the yard conditions, to conform to the better through facilities

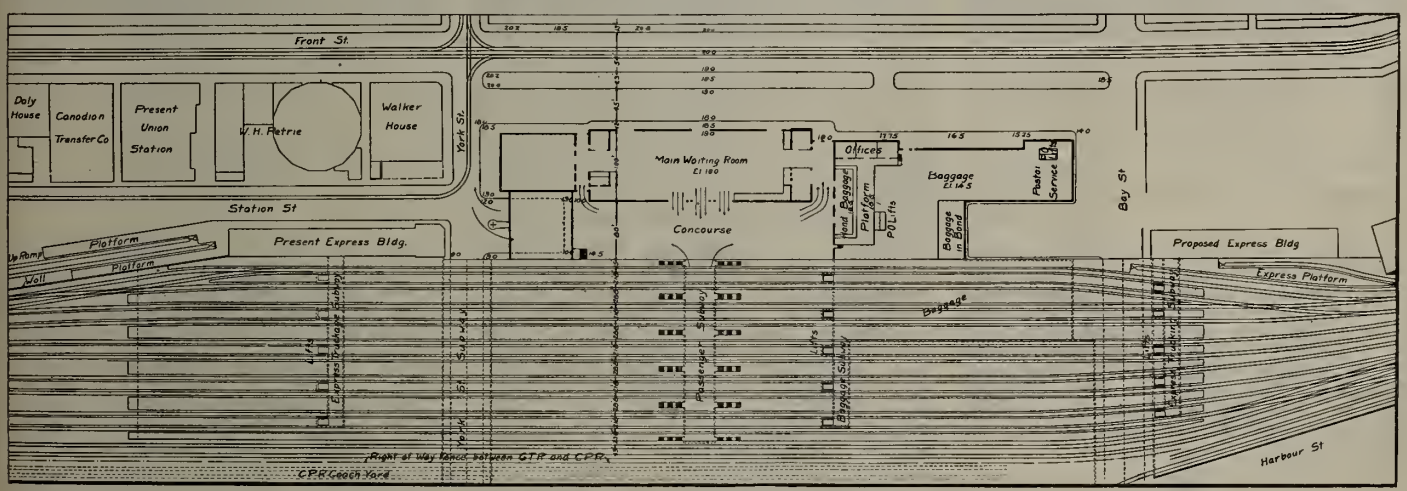


Fig. 1. Plan of New Union Station, showing the Trackage, and Passenger and Baggage Facilities.

provided by the viaduct. Likewise, the tracks to the south leading to the G.T.R. old Northern wharves are to be left as at present for future rearrangement.

Under the present arrangement, only the tracks to the north of the G.T.R. shops are crossed by a highway bridge, 170 ft. long, an embankment leading from the southern end of this bridge to

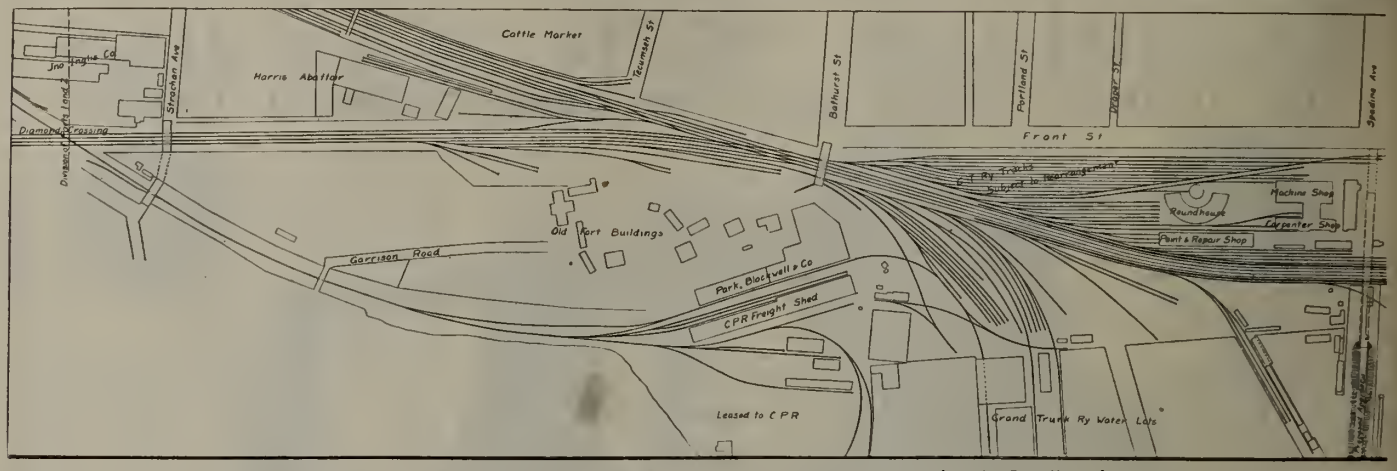


Fig. 3. Sec. 1. Plan of Viaduct Scheme from C.P.R. Diamond Crossing to Spadina Ave.

grade, the through tracks being crossed at grade. The proposed arrangement necessitates an entire change at that point, as the tracks being raised there about 6 ft. would make the city wharf immediately to the south of the through tracks impossible of approach except by a very steep ramp. The proposed plan is

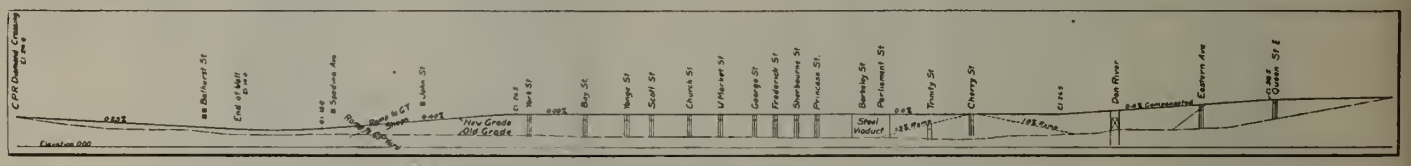


Fig. 2. Profile of Viaduct Scheme, from C.P.R. Diamond Crossing to Logan Ave.

to cross all the tracks on a bridge about 770 ft. in length leading from the higher land on the north, with a slight ramp, and extending beyond the most southerly tracks. The city wharf to the south is to be filled in, making an approach ramp 700 ft. long, meeting Lake St. produced. Practically the whole of this approach will be over present water lots. That part of the future extension of Lake St. is also water.

widens to five tracks, the fifth one leading into the elevated C.P.R. passenger car yard to be mentioned lated.

At John St., the track level has been raised 11 ft., with a corresponding raising of the overhead bridge at the point where it crosses the viaduct. The approaches will be as before, the south one leading to the extension of Lake St., which it is expected will be made such a thoroughfare as to divert a lot of the traffic that at present crosses and recrosses the tracks from a lack of roads to the south of the track. Consideration was given to the possibilities of a subway at this point instead of the overhead bridge, but the plans were abandoned in preference to the accepted scheme, on account of cost.

these tracks would have to be crossed by the street on the level, reducing the effectiveness of the whole scheme of level crossing elimination. The shunting around of the cars in the making up of the trains would be a constant source of danger, and from the railway standpoint, the yard accommodation would be materially reduced by the breaking up of the trains at the crossing. On the north of the tracks leading into the station, there is a single track easterly ramp leading down to the express building just west of the station. The tracks at York St. are raised 16 ft. above their former level.

From the easterly end of the elevated C.P.R. coach yard, there is a westerly ramp, single track leading down into

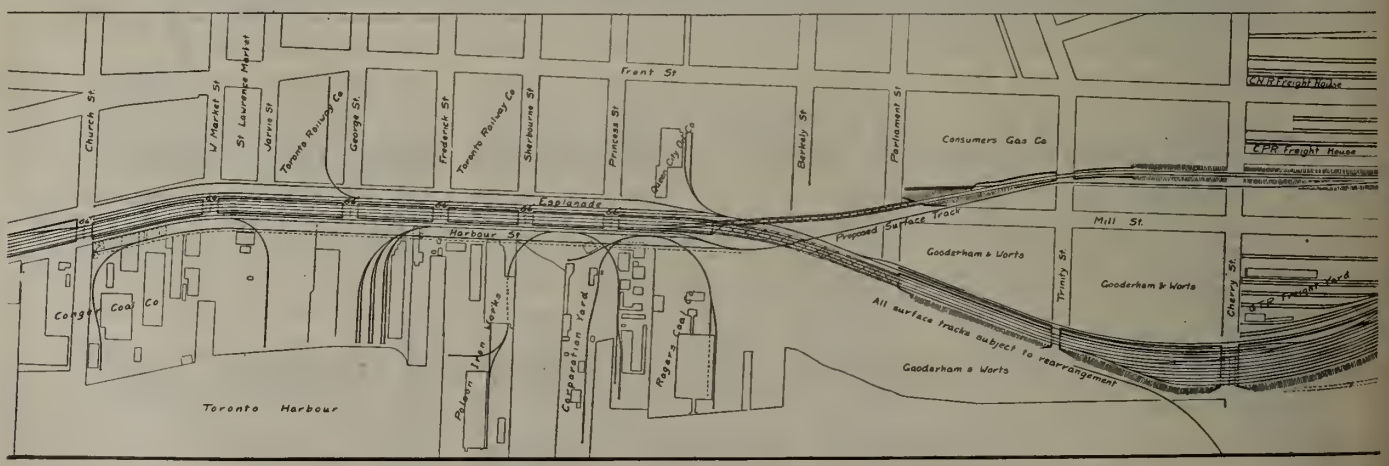


Fig. 3. Sec. 3. Plan of Viaduct Scheme from between Scott and Church Sts. to Don freight yards.

The through line continues on the ascent on the 0.4% grade to near York St., where the level is attained at elevation 26.5. Between Spadina Ave. and John St., there are two ramps leading down from the four-track viaduct. On the north side, there is a double track ramp

From John St., the tracks on the viaduct diverge, the northern portion running through the new union station, and the southern lot forming the new C.P.R. passenger car yard. Various considerations entered into the reasons for the raising of this yard. In the first place,

the C.P.R. freight shed. This ramp leads off from Bay St., where the street is taken under the wide stretch of tracks in an 80 ft. subway. Just east of Bay St., on the north side, there is a new express building, on the level of the viaduct. Yonge St. is crossed on an 80 ft. subway,

shorter than Bay St, from the convergence of the tracks. The subways from this point on, are all 66 ft. wide. At Scott St., the tracks have converged to six, which continues to Church St., where they come down again to four. Near Yonge St., there are two steel trestles leading off from the viaduct to fruit warehouses, the double track one on the north side leads into the G.T.R. fruit warehouse, and the single track one on the south into the fruit warehouse on the wharf.

The four track viaduct, with concrete retaining walls, continues to within 300 ft. of Parliament St., crossing West Market, Jarvis, George, Frederick, Sherbourne and Princess Sts. on 66 ft. subways. Along this portion of the line, there are at present individual crossings leading into each of the various industries located along the bay front. This viaduct scheme would cut off most of them from communication with the Esplanade, so this difficulty is to be remedied by the city putting through a new street, called Harbour St., just south of the viaduct, so that each of the industries will have access thereto. Along this street, there are to be three surface tracks, two on the north and one on the south side of the street to be operated by the C.P.R. for handling the traffic from the industries along the street, various spurs running into the factories. Similarly, on the north side of the viaduct, along the Esplanade, there are three surface tracks, one on the north side and the other two on the south side of the street for the industries along the street, these lines being operated by the G.T.R. From the point 300 ft. west of Parliament St., where the concrete viaduct ends, the G.T.R. and C.P.R. separate, the G.T.R. diverging south on four tracks, and the C.P.R. diverging towards the north on two tracks, these six tracks being carried on two steel viaducts to the east side of Parliament St., where the viaduct continues as before. The prime reason for the carrying of this short stretch of the viaduct on steel lies in the fact that it is at this point that the surface tracks on the north and south sides of the viaduct up to this point cross over to the ramps leading up to the elevated tracks. Likewise, the distance between Berkeley and Parliament Sts., is so short that a retained viaduct would be more costly.

From the east end of the steel viaduct, the G.T.R. four tracks sweep southerly and loop northward, forming a small elevated yard at the curve. The north side of the viaduct, from the point where it leaves the steel work to the Don River bridge, is retained by concrete walls, while the south side is merely embanked. Trinity and Cherry Sts., both pass under the tracks in subways. From a central point on the north side, there are two ramps, one in each direction, leading down to the surface tracks. The east end ladder track on the south side also leads down a ramp along the edge of the earth embankment. The surface tracks on both the north, where the freight sheds are located, and on the south sides, are subject to re-arrangement on the completion of the viaduct scheme. From the Don easterly, there is a four-track viaduct on an earth embankment, crossing Eastern Ave. and Queen Sts. on 66 ft. subways. The grade up to Queen St., is 0.4% com-

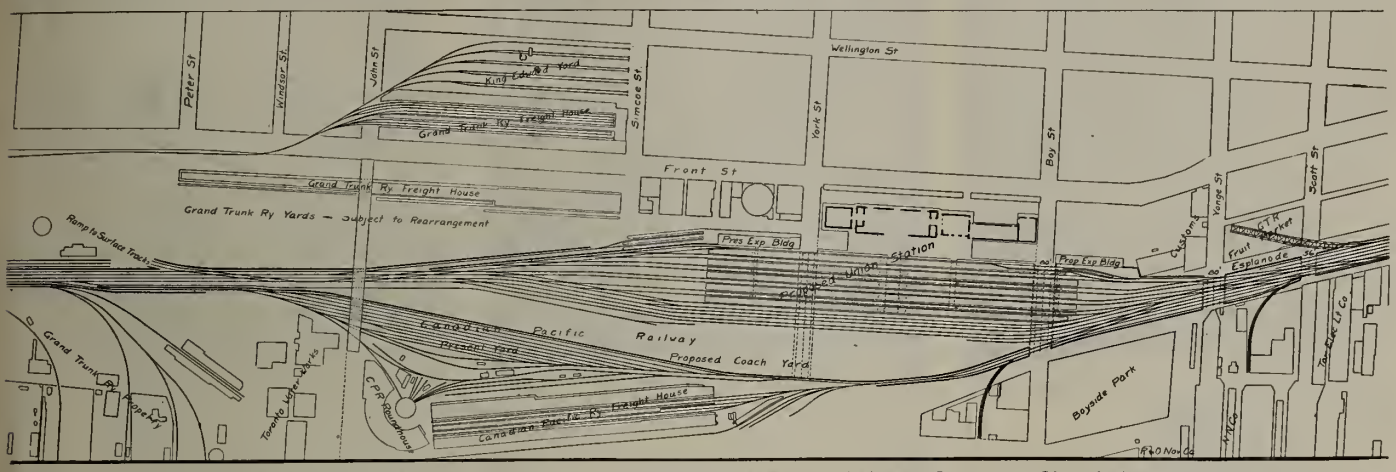


Fig. 3. Sec. 2. Plan of Viaduct Scheme from Spadina Ave. to between Scott and Church Sts.

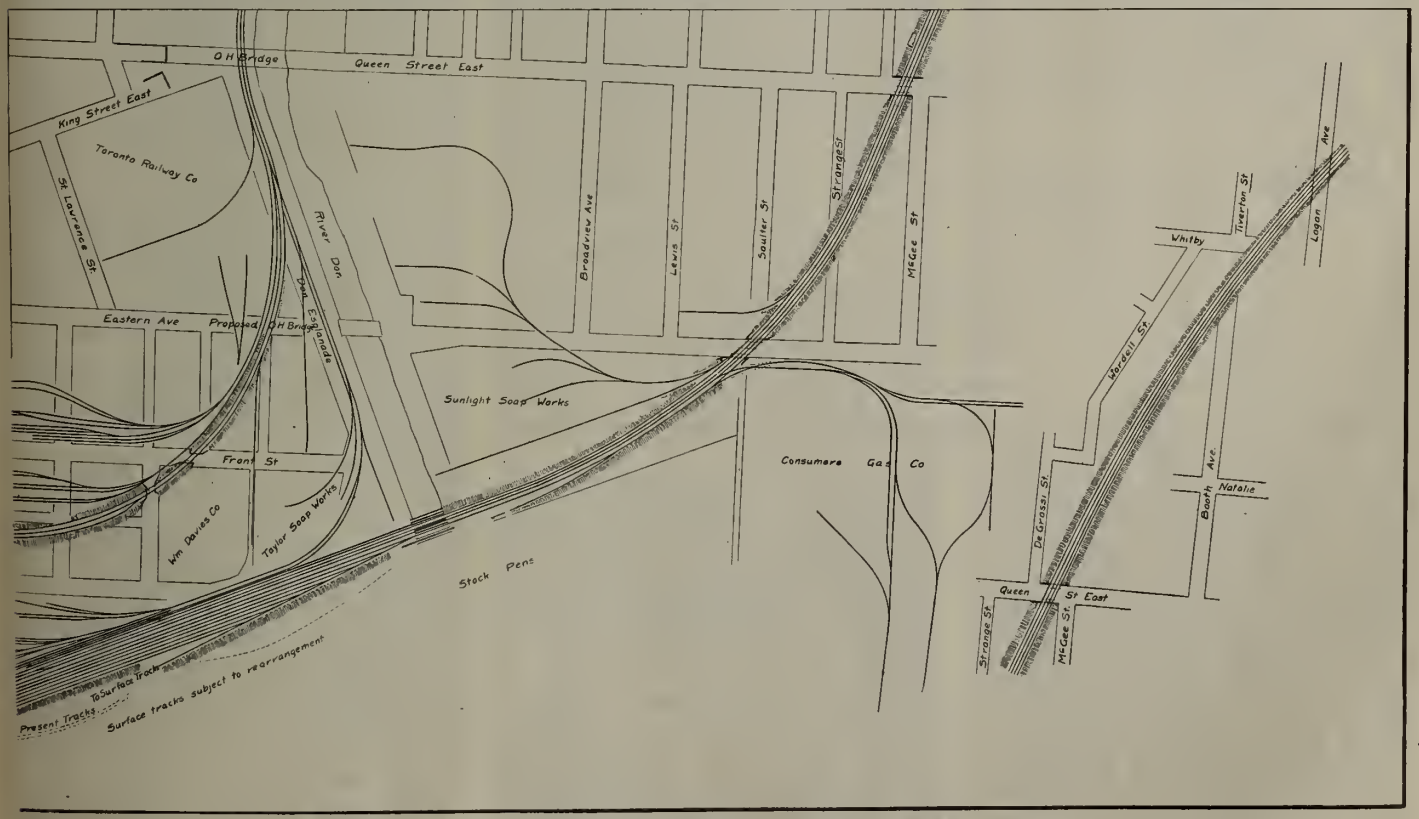


Fig. 3. Sec. 4. Plan of Viaduct Scheme from Don Freight Yards to Logan Ave.

pensated. At Queen St., the elevation is 39.5, the line at that point gently sloping up to meet the old level at Logan Ave.

The C.P.R. line where it leaves the steel viaduct at Parliament St., is carried on an earth embankment up to the point at which it again strikes grade at Eastern Ave., with the exception of the short stretch of reinforced concrete viaduct where the double track line crosses Trinity St. on a 66 ft. subway. The Overend and Front St. subways are both 33 ft. Eastern Ave. is to cross the tracks on an overhead bridge, which will probably be of the same type as that further along at Queen St., where the bridge, with long, easy approaches, crosses both the tracks and the river. All the subways along the whole line, with the exception of Trinity Front and Vine streets are to have a clear headway of 14 ft. Trinity, Front and Vine streets are to have a smaller headway of 10 ft. The overhead bridges are all to have a clear headway of 22 ft. 6 ins.

It will be noticed in the description of the viaduct, that there will be no level crossings at Bay, Yonge or Church Sts., all the surface tracks crossing streets being further east. The Board has ordered that none of these surface tracks between Church and Parliament Sts. be operated during May, June, July, August and September except between 10 p.m. and 6 a.m., unless the merchandise carried be of a perishable nature, in which case the train may operate if preceded by a flagman on foot.

The city is to bear one-third the cost of building the viaduct which is to include the C.P.R. passenger car yard and the G.T.R. Don sorting yard, excepting the cost of rails and track laying. Likewise, it is to bear one-third the cost of the bridges at Spadina Ave., John St., and Eastern Ave., and of the substructure made necessary by the elevation of the station. These payments are to be made as the work progresses on the submission of progress reports.

The new union station is to be located facing on Front St., between York and Bay Sts., east of the present location, and and will occupy the entire frontage between these two streets. The station plan, as prepared by the G.T.R., is shown in fig. 1, and a cross section through the station is shown in fig. 4. The only portion of the old station retained is the old Canadian Express Co.'s building to the west of the new station on York St. This building is to be increased in capacity by the addition of another story, and a similar structure will be erected to the east of the new station on the east side of Bay St., for the Dominion Express Co., the main floor of this latter being on the viaduct level, while the old building is to retain its former level, with the tracks leading down to it from a ramp as previously explained. The two buildings will thus bear the same relation to the station.

The station building is to be located 80 ft. back from the street curb. Along this curb, there is to be a 23 ft. sidewalk, instead of the former 13 ft., back of which will be a 45 ft. driveway, separated from the station building by a 12 ft. sidewalk along the wall. The central part of the station building is a large structure about 300 by 100 ft. in which is the main waiting room. As the elevation figures on the plan show, the waiting room floor is at practically the same level as that of the street. At either end of this main structure, there are smaller rooms which will probably be allocated for lavatories, etc., when the details of the design are finally worked out. The plan, as shown, merely gives the general arrangement, without regard to the refinements in interior arrangement that will follow later.

At the west end of the building, there is a large addition 100 by 80 ft., which will probably be used for a dining room. There is another room of similar proportions to the rear of this room. To the east of the main waiting room are the baggage facilities in an addition extending over to Bay St. This building will have a floor space of 59,000 sq. ft., of which there is 7,000 sq. ft. for baggage in bond, and 5,000 sq. ft. for hand baggage. The Bay St. end is to be sectioned off for the postal service.

Between the main waiting room and the tracks, there is a concourse 80 ft. wide, the full length of the waiting room. This concourse slopes down with a 4.10% slope from the waiting room elevation of 19.0, to that of the subway under the tracks, which is at elevation 14.5. The subway from the concourse runs under the whole ten tracks, with stairs on each side up to the platform level of 27.3. Outgoing passengers come into the main waiting room from the street, and on into the concourse, where they are met at the entrance to the subway by the ticket examiner, who directs the passengers to the correct stair, each stair being numbered, and a large sign will give the time of train departure, its name and general routing. At the top of the stairs there are two gates, one to each track, a fencing down the centre of the platform dividing it. The gate of the outgoing train will be the only one open, so there will be no confusion in taking the wrong track. The trainman will also be located at this gate instead of at the train steps, to again examine tickets and direct the passenger to the proper car. The ticket offices are along the south wall of the main waiting room, on the path of the passenger from the street to the tracks. In the event of the passenger having purchased his ticket at the city ticket office and driving down, he can drive up to the baggage delivery entrance, have his baggage removed and checked, and can then go directly into the concourse through the 19 ft. passageway along the east side of the waiting room. For the outgoing passenger, the conveniences are excellent.

The incoming passenger comes out through the subway into the concourse where he can pass out either side exit, without having to pass through the waiting room. If he has baggage, he will come out by the passage on the east side wall, where the baggage rooms are located. The station has been well designed for the relieving of the waiting room for needless through passage.

All the tracks in the station are through tracks, with no stubs. The 10 tracks are 1,500 ft. long, and are covered with the Bush low type two-track span train shed, with openings the full length over the centre of each track the width of the smoke stack, and at such a height as to just clear the stack. The double-track spans rest on columns down the centre of the passenger platforms. These passenger platforms are about 20 ft. in width, leaving a 10 ft. space along each side of the central dividing fence, which should prove ample for each track. The standing capacity of the 10 tracks will be 290 cars of the standard 70 ft. length.

Between each passenger platform, there is a separate baggage platform about 12 ft. wide, for the handling of all baggage clear of the passenger platforms. The baggage is unloaded on the side opposite to that on which the passengers leave, on to trucks in the usual manner. At the westerly end of the baggage room, there is a subway leading under the tracks at the same elevation as the baggage room floor, 14.5. Leading down into this baggage subway, there is a lift from each baggage platform on to which the trucks are run, and lowered to the baggage room level. The baggage room is rather extensive, for not only is there the space in the building at the end of the main waiting room, but there is a large space extending out under four tracks. The hand baggage platform at the west end of the baggage room, is at elevation 18.5, 4 ft. above the baggage room floor, so that all hand baggage can easily be handed up to the hand baggage storage along the concourse exit. Bay St., along the side of the baggage room and under the track has been increased in width from 80 to 110 ft., for 110 ft. under the tracks. There is a driveway 80 ft. wide by 150 ft. long in the Bay St. side of the baggage room. All this space provides ample accommodation for the baggage wagons coming into the station. The outside area is slightly lower than that of the baggage room floor, so that no lifting of baggage on to the wagons is required.

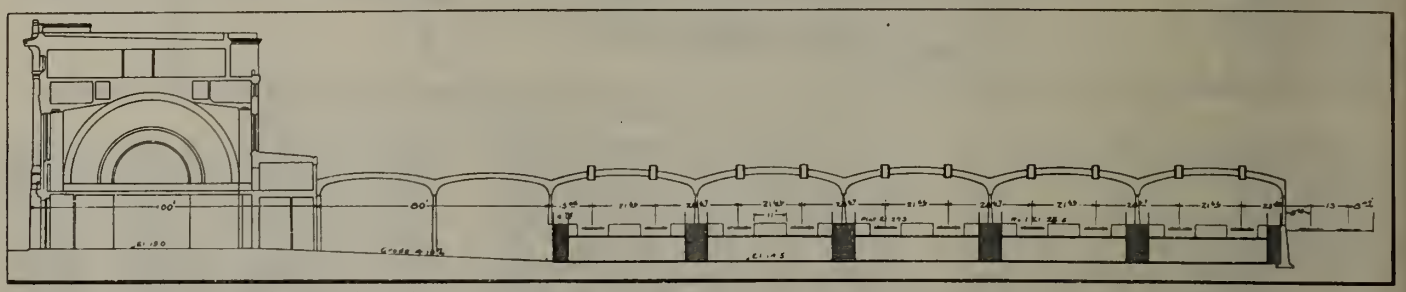


Fig. 4. Cross Section through Union Station and Passenger Subway under Tracks, showing Interior Arrangement.

The express traffic is handled through the station in the same manner as the baggage, a subway with lifts running under the tracks from the two express buildings.

The question as to what extent the C.P.R. will use the new union station is still in doubt, and if that company decides to withdraw a large portion of its passenger service, a modification of the station plans may be necessary. It appears to be settled that the C.P.R. and Canadian Northern Ry. will build a union station at North Toronto, to which a large portion of the C.P.R. passenger traffic may be diverted and all the Canadian Northern Ry.'s passenger business will be handled there, as it is not the latter company's intention to use the down town union station at all, its present use of the existing union station being only temporary.

During May, 19 fatal, and 29 non-fatal accidents were reported, in connection with Canadian railways. Of the fatalities, six were due to being run over, three each to falls and to being struck by trains, two each to being crushed between cars, and to falling material, and one each to a collision, to jumping from a locomotive and to a fall.

OIL BURNING LOCOMOTIVES ON THE CANADIAN PACIFIC RAILWAY.

By Frederick H. Moody, B.A.Sc.

For the second time this year the subject of oil for fuel is being discussed in these columns. the previous instance being in the April issue, when the oil burning motor car which the Grand Trunk Ry. is operating from Black Rock, N.Y., to Port Colborne, Ont., was described with particular reference to the motive power end with its oil fired boiler.

The equipment to be described on this occasion is that of the C.P.R., the management of which has for some considerable time been contemplating the use of fuel oil for locomotives on the British Columbia Division. Those at present equipped and in the course of equipment number 90. of which 14 are for the Esquimalt and Nanaimo Ry., on Vancouver Island. Seven stationary boilers for pumping plants at oil storage plants on the B. C. division, are also being equipped for oil burning.

In view of the widespread interest being evinced in the use of oil for fuel, not only in Canada, but more particularly in the southwestern part of the United States, it is the intention to include here a brief history of the use of fuel oil for railway motive power, from the time its use has been so seriously considered. this period being confined for the most part to the last decade, or slightly longer.

It is said that the first serious attempts at the use of oil fuel in the United States were in 1894 on the Southern Pacific Rd., although the Santa Fe lines experimented as far back as 1887, these early attempts being the result of a scarcity of coal and an abundance of crude oil, making the use of the latter highly desirable if some method of employing it that would prove as satisfactory as the use of coal could be devised. The results of many years of patient experimental work have been crowned with success, so that today, nearly all the lines in the southwestern States use crude oil as locomotive fuel, with the best of results. Since that time, the practice has been taken up by a number of other roads among which is the C.P.R.

When the first attempts at the use of oil for locomotive fuel were instituted in the U.S., there was a certain amount of precedent upon which to base the designs, for it had been employed with a marked degree of success in the Baku oil fields of Russia. The great difference in the many conditions surrounding the use of oil in the two widely separated districts, with their distinctive ideals in motive power, left a great many difficulties in the path of the early experimenters, which had to be solved independently of the results obtained under the other entirely different conditions.

In the first attempts at its use, the coal burning grates were retained, but the experimenters soon learned that satisfactory results could not be obtained with the draught spread over such a wide area as that presented by the grate surface, and that it must be concentrated. The uncontrolled influx of cold air proved very detrimental to the flues, and, what was even more important, surplus oil in dripping down from the burner, instead of falling on a retaining surface where it might still burn off to advantage, dropped down into the ashpans and frequently burned in them with destructive results. Tight ashpans have been known to flood, and the overflow on the roundhouse floor and pit furnished an ever present source of danger from conflagration. The oil over everything gathered up a lot of unnecessary dirt, making the use of the old grate bars an undesirable feature of oil burning equipment.

In the earliest attempts, the burner was placed at the rear of the fire box, the same as the burner of the G.T.R. oil burning motor car referred to earlier. The flame was directed forward under an arch, by which it was deflected backward and up into the flues. Except for light running, this proved an undesirable arrangement, as the draught would lift the flame over the arch and cause it to enter the flues without being completely consumed, and without a full utilization of the fire box heating surface area. The result was a dense black smoke at the stack, and a corresponding decrease in the amount of heat drawn from the oil from its incomplete combustion.

This unsatisfactory arrangement was replaced with a "flash hole" arrangement whereby a small hole in the grate, which was bricked over, provided a vertical draught to meet the spray of oil from the burner, which was still located in the same position at the rear of the fire box. The brick arch in the same location was likewise retained. The vertical draught striking the horizontal jet of spray at right angles gave very satisfactory results in the combustion of the oil. This arrangement prevailed until 1903.

In that year, the burner was changed in position from the rear to the front of the fire box, the flame being directed forward from under the arch, circling up at the rear of the fire box, and then forward through the flues, the flame striking all parts of the heating surface and at the same time being given a longer period in which to become completely consumed before passing into the flues. While this was an improvement on the then existing methods, there was still a great deal of difficulty experienced from incomplete combustion of the oil vapor when the locomotive was working hard, even with this longer path in which to burn. Various changes in the shape of the arch were tried with varying degrees of success, until finally in 1904 it was discovered that additional draught was required to completely consume the vapor. This was accomplished by admitting a draught of air through a hood in the fire box door, which mixed with the upwardly deflected spray, adding sufficient air when the spray was already partially consumed to complete the combustion. This arrangement constitutes what is called the horizontal draught system. Essentially, it is the system at present in use on a number of roads, but with slight variation to meet the individual ideas of the different designers. Since the day the horizontal draught was introduced, the development in oil burning equipment has been one of refinement rather than anything radically different in design.

Coming more specifically to the C.P.R. practice, the equipment as installed on the company's locomotives, to the design of the mechanical department, based on the results of the findings of the motive power officials of the Southern Pacific Rd., will be described. In the first place, the oil burning equipment being applied to existing locomotives designed for the burning of coal,

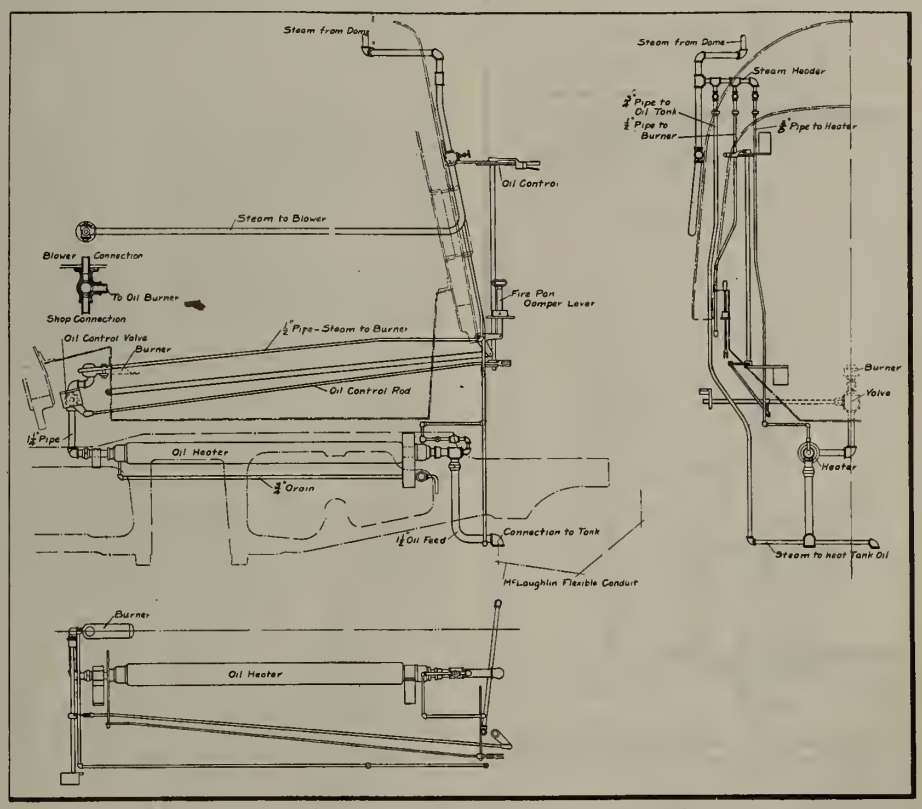


Fig. 1. Piping Arrangement on C.P.R. Oil Burning Locomotives.

the idea borne in mind throughout was to change the construction of the locomotive as little as possible, but rather to adjust the oil burning details so as to work into the existing design.

In consequence of this limitation on the design being required to fit old locomotives, the oil storage reservoir is a separate tank so constructed as to fit into the coal space of the tender. Other reasons exist for such an arrangement. principal among these being the fact that if the tank were made integral with the water tank, the locomotive could not be employed off the division on which oil was the fuel employed. In addition, combining the two tanks makes it more difficult to undertake repairs. The tanks of the C.P.R. locomotives are built up of ¼ in. plate throughout, and are divided into eight communicating compartments. as in water tanks, with a central dividing wall and three cross walls, all of ¼ in. plate. The inside over all length is 13 ft. 3 ins., and width 9 ft. 5 ins., with a depth at front of 5 ft. 3 ins., and at the rear of 3 ft. 6 ins. The

capacity of the tank is 3,000 imp. gals. The tank is filled through a cast iron manhole in the top, on which there is hinged a cast iron door, held down on the manhole, which has an 18 in. opening, by four ½ in. swing bolts, which drop back on the top of the tank when the cover is opened for filling.

In the bottom of the tank, there are two pipe openings, one of which connects with the locomotive, as may be noted in fig. 1 showing the application of the oil burning equipment to the fire box. On each side of the tank centre line, there is a valve of the form shown in fig. 2. That on the left is for the feed, and that on the right is for draining off water or draining the tanks, this latter valve leading into a short length of pipe outside the rail, where the oil may be thrown away, or, by a further connection, drawn off into a storage tank, when for any reason the tank is to be cleaned or repaired. The construction of the valves is simple. A cone on the lower end of a valve rod, guided in a bridged frame on the bottom of the tank, fits into a corresponding opening

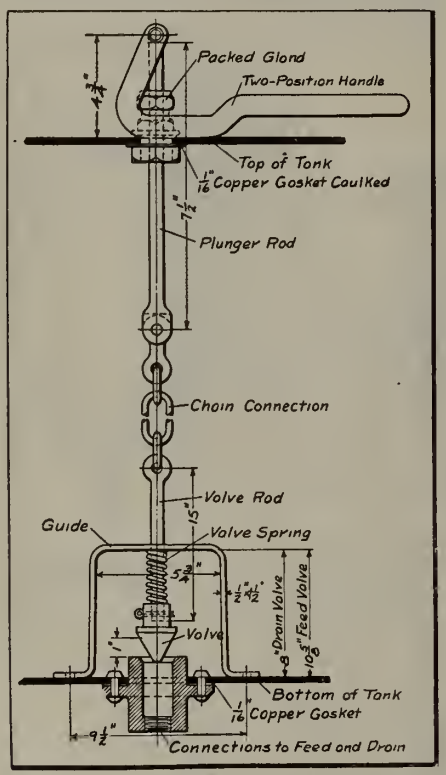


Fig. 2. Drawing Off and Drain Valves in the Oil Tank.

in a cast member rivetted to the bottom of the tank. An upper plunger rod is connected to this valve rod by a length of chain, this upper plunger rod being guided in the top of the tank through a packed gland which prevents the oil and oil fumes from escaping around this rod. A two position handle of the form indicated, raises or lowers the valve into the open or closed position. When the handle is vertical, the valve is held closed by the coiled spring wound on the valve rod, bearing on the top of the valve and on the under side of the bridged guide. These valves have thus only two positions—wide open and closed. The two openings in the top of the tank between these two are for a ½ in. pipe connection from the locomotive for the heating steam. The oil in the tank in cold weather tends to coagulate and will not run freely. To overcome this difficulty, two different methods of heating the oil are in use. The first is similar to the one described in connection with the G.T.R. oil burning motor car, where there was a steam coil in the oil tank, encircling the oil valve outlet. The method employed in this case, which is the one in most general use, has the steam pipe, in this case ½ in., extending down into the oil nearly to the bottom, where it branches with a T connection, and on the end of each branch there is a downwardly projecting elbow from which steam is blown through the oil around the drawing off valves, keeping it in a freely flowing fluid state as required. The principal objection to this method of heating the oil lies in the fact that the condensed steam mixes with the oil in the tank, instead of passing off through the coils as in the radiation method of heating. This water in the oil must be prevented from passing off into the burner with the oil. Water, from its higher specific gravity, settles to the bottom in the tank, thereby presenting a simple method of keeping the oil and water separate. The drain valve in the bottom of the tank, which has been described, is flush with the bottom. The feed valve, on the contrary, has the valve face raised above the tank bottom 2 11-16 ins. below which level the water may accumulate and be drained off from time to time through the drain valve. Normally this drain valve is left closed, and the feed valve kept open, the burner control being at a point further along the connection. It may be mentioned that these valves, while controlled in this case from the two position handles on top of the tank, in the majority of designs with a control system similar to this have the control handles on the front end of the tank connecting to the valve chain through a bell crank.

Each tender has a measuring rod as in fig. 3, to determine the quantity of oil remaining in the tender. This is accomplished by noting the depth of oil in the tank and then referring to a capacity table for the quantity this indicates. The fireman is at all times aware of the conditions of his fuel. The construction of the measuring rod is very simple. A short length of 1 in. pipe, with 1½ to 1 in. reducer on its upper end, is mounted on the top of the tank by two nuts, on each side of the top plate. Through this pipe there is a ½ in. square rod extending to within ¼ in. of the bottom of the tank, and graduated in inches through its length. The raising of this rod from the supporting pipe gives the fireman the required knowledge.

Reference to fig. 1 shows the arrangement of the oil burning apparatus as applied to the fire box. Oil from the tank passes through a 1½ in. McLaughlin flexible conduit, and on through similar piping to an oil heater and thence to an oil control valve near the oil burner, where the flow of oil is regulated by the fireman, before passing into the burner. Steam for various auxiliary purposes is drawn from the steam dome through the piping to be seen at the top of this illustration. From a steam header on the back sheet of the fire box, the different connections branch off. Referring to the end elevation in fig. 1, the ⅜ in. connection on the right leads to the heater. The third, or ¾ in. connection, leads down and through another flexible conduit to the tank, providing steam for the heating of the oil in the tank before drawing off. The middle, or ½ in. pipe of this battery of three, provides steam to the burner for the atomizing of the oil. To meet these requirements, steam for the blower can be drawn from the dome. Provision is likewise made for steaming the boiler when cold by a shop connection to a 3 way valve on the outside of the smoke box, a connection running back along side the boiler to the header mentioned. Through the 3 way valve steam can be drawn from the shop main and passed to the burner and also to the various heating connections.

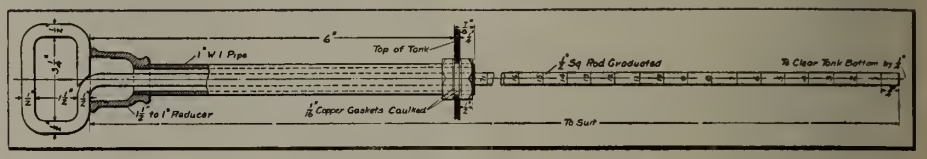


Fig. 3. Gauge for Reading the Depth of Oil in Tank.

The type of heater or oil "superheater" used is shown in fig. 4. This second heater is required to maintain the free flow of the oil to the burner and to keep the oil from thickening between the time it leaves the tank heater and the time it reaches the burner. This heater is essentially a steam jacketted oil pipe. Through the centre there is a 7 ft. length of 1½ in. pipe, connecting at the right end through a tee to the oil tank main, and at the other end to the oil burner pipe. Encasing this, there is a 6 ft. 2 in. length of 3 in. pipe, attached to the inner pipe at the left end by a 3 to 2½ in. reducer, with a 2½ in. bushing tapped 1½ in. to receive the inner pipe. The other ends of the two pipes have a packed gland connection to permit of any variation in length between the inner and outer pipe lengths from unequal expansion. This packed connection is similar to that of the other end, except that the bushing, instead of being internally threaded, is bored to receive the outer diameter of the 1½ in. pipe, and counter bored for packing, which is forced into the space with a 2½ in. pipe cap bored the 1½ in. pipe size. Steam enters the annular space around the inner pipe through a ⅜ in. steam connection in the right reducer, and the condensation is drawn off through a ¾ in. pipe connection at the other reducer, this latter pipe being controlled by a ¾ in. globe valve. The steam pipe has a by pass connection into the end of the inner pipe, provided for the purpose of blowing out any dirt accumulation that

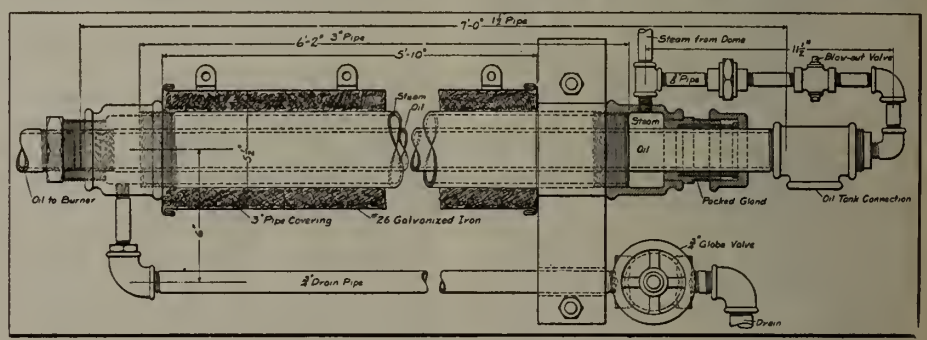


Fig. 4. Heater for Maintaining the Oil in a Fluid State.

may gather inside this oil space. It is controlled by a blow out valve.

The "superheated" oil passing on from the heater, is controlled by an oil feed or firing valve near the burner. The form of the valve, as shown in fig. 5, closely resembles a plain taper turn cock, the main point of difference resting in the shape of the passage through the inner or turning part. Of necessity, the

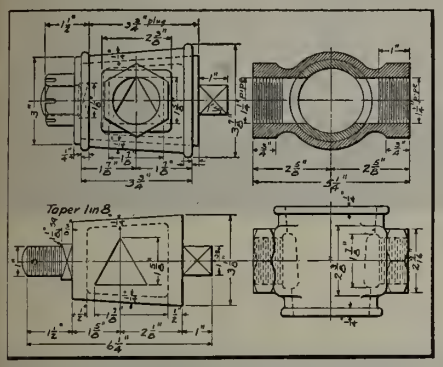


Fig. 5. Feed Valve for Close Adjustment.

valve, to be efficient, must be capable of a very close control, and this has been obtained in a very satisfactory manner by making the inner passage triangular in section, so that the supply may be regulated within very close limits, especially when under light operation, the oil flow being concentrated in the tip of the triangular passage.

The arrangement of the oil valve control mechanism may be seen in fig. 1. A horizontal oil control rod on the end of the valve lever connects with a lever on the lower end of a vertical shaft at the rear left hand corner of the fire box, on the upper end of which there is the regulating quadrant in fig. 6. This quadrant has a 90 deg. throw, with a notched engaging surface into which the engaging pin in the handle grips. This lever is connected to the vertical rod referred to, by a squared end fitting a corresponding opening in the handle, the whole being pinned together. Near the notched rim of the quadrant on the "closed position" side, there is a short circumferential slot, in which a block may be clamped in the position desired. As shown by the detail of the stand by block and catch, the handle contains a spring plug that engages in the notch in the upper end of the clamped block, but which at the same time may be moved past the catch when desired. When the locomotive is standing by at a terminal or for any protracted period between runs, a small sustaining flame is all that is required, just sufficient to keep the flame burning. This position is first determined, and the block in the quadrant set, so that the fireman can almost automatically set the valve in the stand by position with a consequent saving in fuel oil.

Experiments have shown that the best types of burner for locomotive use are those using a wide, flat flame, with the oil supplied at low pressure. In this particular, railway practice differs from stationary practice, for, in the latter, it appears to matter very little what shape the flame assumes. The wide, flat flame is here desirable so that the whole interior of the firebox may be completely lapped by the flame. Better combustion is also to be had with a low pressure from the oil with an outside mixing type of burner. With the inside mixing type of burner an oil pressure in the tank must be maintained if the best results are to be obtained from the combustion of the oil. This has been tried in locomotive practice, maintaining a pressure in the tank with compressed air. Satisfactory results were to be had from an oil burning standpoint, but the increased amount of trouble introduced in the auxiliary apparatus required to maintain the air pressure in the tank, did not warrant its continued use, especially when equally satisfactory results were to be had with the outside mixing heater, in which the tank pressure is dispensed with.

The type of burner which is used on the British Columbia lines of both the C.P.R. and the Great Northern Ry., is the VanBoden-Ingalls, which is in use on the Southern Pacific lines. It is an outside mixer, and is shown in fig. 7. Oil entering the upper chamber from either the upper or lower pipe connection depending on the piping (the one not used is plugged), passes forward, dribbling down on a corrugated surface table at the front end, from which it is picked up by a jet of steam coming through a thin wide slit in the lower chamber, the steam in passing over the corrugated surface of the table atomizing the oil and spraying it over a wide area in the fire box. The steam enters the burner from the rear around the lower oil connection core. The burner is made of cast brass, as the porosity of cast iron makes it unsuitable, the steam penetrating the partition between the two chambers, causing the flame to act in an ir-

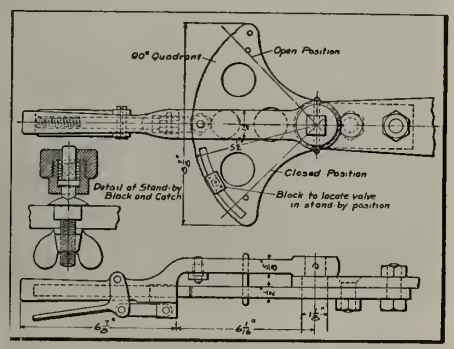


Fig. 6. Quadrant for the Fireman's Control of Feed Valve.

regular manner. The burner is carried in the forward end of the brick pan, projecting the flame backward as mentioned earlier.

The brick pan which replaces the old grate bar arrangement is made of ¼ in. plate, and is attached to the interior of the fire box all around, some few inches above the mud ring, by cast steel brackets attached to the latter. This is a desirable arrangement, as the rivets through the mud ring are thus left exposed where they can easily be got at for caulking.

Experiments conducted to determine the best point at which to bring in the draught of air that is to combine with the spray of oil have shown that the most satisfactory results are to be had when the air combines at a point where the spray comes to a focus some 5 or 6 ft. from the burner. In the installation under consideration, the draught is admitted through griddings in the sloping sides of the fire brick pan about 5 ft. from the burner. These griddings, one on each side, consist of a cast iron frame containing three rows of 4½ in. deep openings to extend through the bricks about 2 ins. square, 8 in a row. These two draughts focus with the nearly horizontal fan shaped spray at nearly the same point.

Through the fire door there is also a small opening through which the flues may be cleaned by the fireman by the insertion of a small funnel containing fine sand, the draught drawing the sand into the flues, the sharp cutting edges removing effectively the oily carbon deposits that result from the use of oil as a fuel. This operation is performed by the fireman every few miles, depending upon the load.

The C.P.R. is equipping 90 locomotives with oil burning apparatus, these being of the following classes and general dimensions:—

Class.	No. in Class.	Type.	Heat. surface.	Grate area.
N-3	41	2-8-0	3,001	49.5
R-1	6	0-8-8-0	3,417	59.0
D-9	16	4-6-0	2,850	49.6
D-3	2	4-6-0	1,291	23.4
D-4	11	4-6-0	1,299	28.0
L-3	1	2-8-0	1,731	32.0
L-5	3	2-8-0	1,872	32.5
U-3	1	0-6-0	1,544	52.0
V-1	2	0-8-0	2,005	32.7
D-5	6	4-6-0	1,593	31.8
A-5	1	4-4-0	1,150	17.0

The balance of the 97 mentioned earlier are at the stationary pumping plants at 7 points along the line.

The oil for distribution through the oil burning area is to be received at Vancouver, where large storage tanks are constructed. Other tanks have been built along the line. At Revelstoke, there is one of 22,000 barrels capacity, while Kamloops, Field and Rogers Pass each have tanks with a capacity of 15,000 barrels. Smaller distributing tanks are located along the line, a 1,000 barrel one at Notch Hill, and a 600 barrel one each at Sicamous Jct. and Golden. At the larger storage points, there will be additional distributing tanks with necessary piping connecting with the larger storage tanks.

As in the locomotive tenders, the oil in the storage tanks requires heating for a free flow. This is accomplished by means of a gridding of crosswise steam piping in the bottom of the tank, resting on lengths of larger piping running

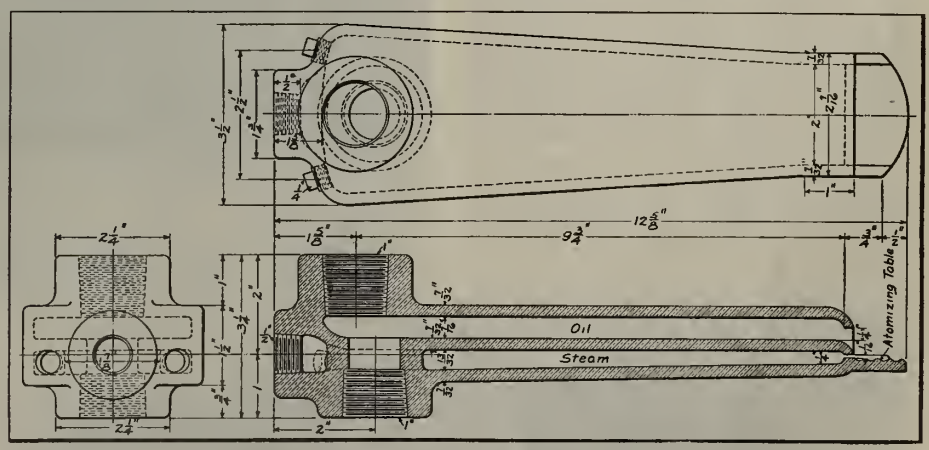


Fig. 7. The Burner for the Burning of the Oil.

at right angles. The steam connection is at the centre.

The oil standpipe for the filling of the tender tanks which is shown in fig. 8 resembles the standard water column very closely. The pit in which the standpipe is located is of concrete, and is covered over at the top, with a cold air opening down through this decking to the bottom of the pit. Around the central length of extra heavy 8 in. pipe there is a heating jacket, 12½ in. inside diameter, made of No. 22 galvanized

sheet iron, this annular space communicating at the bottom with the pit. A wall heater in this pit creates a current of warm air to pass up around the vertical pipe, the air entering cold through the 4 in. pipe. The discharge end of the standpipe is provided with an oil drip pan which can be swung clear while filling.

All the oil burning equipment, with the exception of the burner, which was purchased outside, was made in the company's Angus shops, Montreal, most of the component parts being constructed from standard shapes, plating and

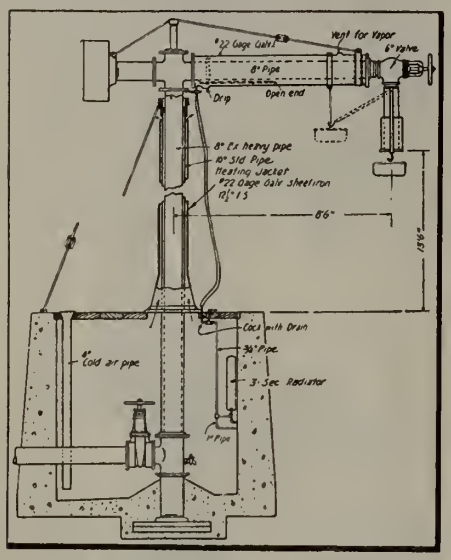


Fig. 8. Oil Standpipe and Heating Arrangements.

piping. The cost of fitting the locomotives out for oil burning is about. $800 each, which includes material as well as labor, but does not include the stationary plants. To change the locomotives back to coal burning would necessitate an entire new ashpan, costing about $180, as it is now necessary to apply self-cleaning pans.

Adjustable Ventilators for Canadian Pacific Railway Refrigerator Cars.

A new type of adjustable ventilator for refrigerator cars has been invented at the C.P.R. Angus shops, Montreal. and has been applied to the cars built last year. So far. its application has been quite as expected in every particular, and, in all probability, this will be the type to be used on all C.P.R. refrigerator cars in future.

The accompanying four illustrations show the ventilator in its four different operative positions. The construction is quite simple, and is shown to the best advantage in fig. 1. Around the ice door opening in the roof of the car at either

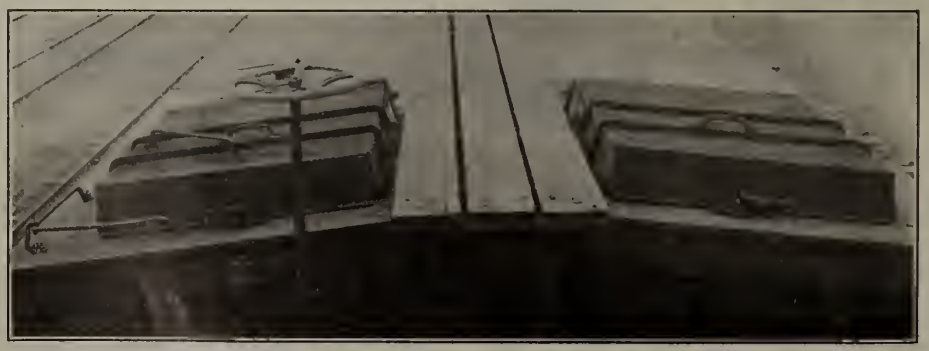


Fig. 4—Ventilator Closed and Clamped Down.

end, there is a metal frame on all but one side, viz., the end towards the end of the car, which is open nearly flush with the decking. Hinged at the rear of this frame, there is a hood-shaped door that can swing down over the top of the wire screening about twice the depth of

Fig. 1—Ventilator opened for Ice Filling.

frame, the sides fitting closely over the edges of the frame. Near the front of this hinged cover, there is a frame of

Fig. 2—Flap up to give Maximum Ventilation.

the front part of the swinging cover, and which is hinged to the cover as shown. This comprises the complete mechanism

Fig. 3—Flap down to give Minimum Ventilation.

of the ventilator.

The ventilator is shown open for ice lling in fig. 1, which indicates in what a simple manner the ventilator may be applied to old refrigerator cars, as no change of design is necessitated in the main structure, the new device being an attachment that in no way interferes with the old arrangement.

When a considerable volume of air is required to circulate through the ice chests into the car, the ventilator is swung over into the position in fig. 2, with the hinged screen on the cover swung into its vertical position. On the front end of the cover there is a swinging flap, which for maximum ventilation is swung up as shown in this illustration.

For a reduction in the amount of ventilation, this end flap may be lowered into the position shown in fig. 3. The ventilating opening is thereby reduced to the small opening under the bottom of the flap. Intermediate amounts of ventilation may be obtained by varying the amount of this opening by means of raising or lowering the flap into the desired location.

To completely cut off all ventilation, the screen door in the cover is swung up flush with the top of the cover and there secured by the lugs shown in the centre of the swinging door in fig. 1. This permits the swinging door to come down flush on top of the hole framing into the position of fig. 4, where it can be secured as indicated.

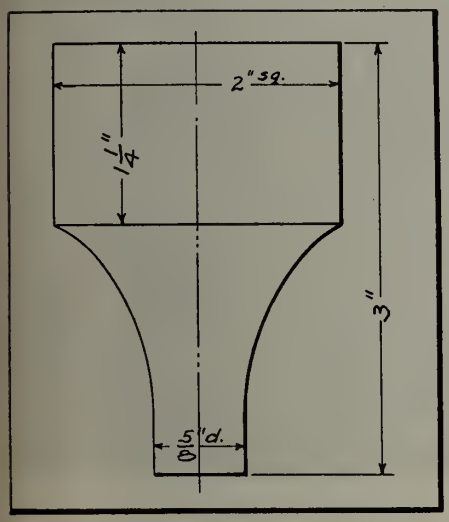
This new type of ventilator permits of a wide range of ventilating currents of air for different classes of perishable freight under the varying climates to which the cargo is subjected during its transportation.

Railway Mechanical Methods and Devices.

Punch for Ripping Frogs at Central Vermont Railway Shops.

Ripping up worn-out frogs in the blacksmith shop, or in the switch and frog shop at large railway centres, would seem to be one of the least sought after of the many repair jobs arising in such shops, judging from the expression of opinions obtained from the foremen. The large unwieldy members are most difficult to handle from their awkward shape.

J. Martin, Foreman Blacksmith in the



Punch for Ripping Frogs under Steam Hammer.

C.V.R. shops at St. Albans, Vt., experiencing these same difficulties in the repair of frogs, cast about for some better means of ripping them up. The method he devised is very simple, and it is strange that it has not been put into more general practice. A punch of the form shown in the accompanying illustration is the only special tool required, and even it is simply made, being forged from the end of a 2 in. square bar without any machining, in the same manner as that used in forming the various tools employed by the blacksmith. The upper end of the punch and also its face are squared.

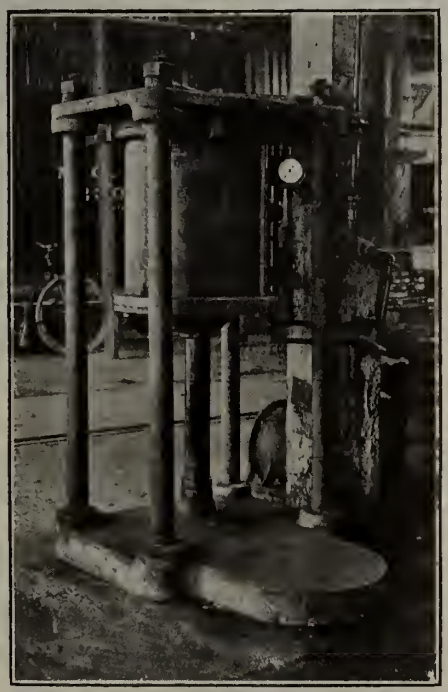
The frog to be dismembered is placed upside down on the anvil of a steam hammer, the binding plate being thus uppermost. The rivets holding the rail parts on to this plate are in pairs, each side of the rail web. In consequence, were a single punch to be employed to drive out the countersunk rivets one at a time, there would be a sagging tendency on the side of the rail from which the rivet was being withdrawn, tipping the whole frog over on that side. Mr. Martin's method is to use the punches in pairs, holding them in tongs over the adjacent rivets on each side of the web. The blow of the hammer on the punch head is thus balanced on each side, with no tendency as before to tip over. A single blow of the hammer is sufficient in the majority of cases to knock out the pairs of rivets. The frog, suspended by block and tackle, is easily moved about into the necessary positions for the removal of each pair, so that it takes but a few minutes to completely rip up a frog for the scrap heap. The frogs. for the most part, are rivetted together with ⅝ and 11-16 in. rivets.

In the assembling of the new frogs, the rivets to be used are heated by a method that while not exactly new, is used in so few shops as to be worthy of mention. Occupying the whole of the flame section of the forge fire, there is a grid plate, filled with rivet size holes closely spaced. Down through these holes the body and end of the rivet project, the head resting on the plate. The part to be heated the most is thereby exposed to the heat more than the head. A great number of rivets can be heated at a time.

Testing Coach Springs at the Michigan Central Railroad Shops.

Springs for railway coaches are made with a wide variation in carrying capacity, and in the majority of shops, no definite or accurate tests are made on the completed spring to determine whether or not it will stand up under the specified conditions of service, the determination in the repair shop being more or less a haphazard one.

Generally, some approximate method of testing is adopted. That in former use at the Michigan Central Rd. shops at St. Thomas, Ont., is interesting. The completed springs, after being inserted in place under the car, were subjected to a load by having a gang of men get into the car and cause it to sway from side to side, the free space between the springs being noted during the operation. This approximate method, while



Air Press with Double Reading Gauge for Testing Coach Springs.

by no means determining the full capabilities of the spring, gave a fair indication of its reliability to stand up under actual service conditions.

It remained for J. Mitchener, Coach Shop Foreman, to devise a more reliable device which at the same time is simpler and handier. This tester is shown in the accompanying illustration. The method of testing the springs is as follows:—The end of the coach for which the springs are intended is first raised by means of two air jacks, one on each side, so that each jack carries exactly the same load as the spring. In order that the air pressure under each jack may be absolutely the same, resulting in each side rising uniformly without swaying movement, the two jacks are joined by a tee connection to the same air valve, making the air pressure absolutely the same in each. A pressure gauge in the tee connection gives the air pressure required to raise the car. Knowing the area of each jack plunger, the weight of one quarter of the car, i.e., the weight to be carried by each spring, is determined.

In order to test the springs under this load, without placing them under the car, as in the former manner, the air press shown in the illustration was made. It is a simple air cylinder and plunger with necessary piping for the air, the whole device being rigged up in the shop, a good portion of the make-up consisting of old parts. The spring to be tested is placed on the table, and the plunger forced down on it, the air gauge registering the actual pressure of the air. This gauge has a double reading—pounds per square inch, and total load; the latter is a factor of the former on account of the plunger area forming a uniting constant. Thus the actual load on the spring may be directly read on the gauge. When the desired load (corresponding to that determined by the jacks) is applied, the free space in the spring is measured, and if it is as required by specification, it is passed. As a rule, 3 ins. is the required free space. The spring, after this test, is ready to be placed in position without any further work.

Tie Plug Forming Machine in the G.T.R. Montreal Shops.

A wood working machine for forming tie plugs in quantities is in operation in the G.T.R. shops at Point St. Charles, Montreal, J. Hendry, Master Car Builder, which was devised by one of the workmen in the wood working department. The plugs as formed are shown in the accompanying illustrations, and also the machine in two stages of operation.

Vast quantities of tie plugs are annually required on such a large system as the G.T.R., and to produce them in the manner followed at many points, by taking a piece of stock of the correct dimensions and pointing the end with a hatchet, and then cutting off to length, would require several workmen constantly employed, increasing labor charges, with an additional increased cost for stock from the fact that it

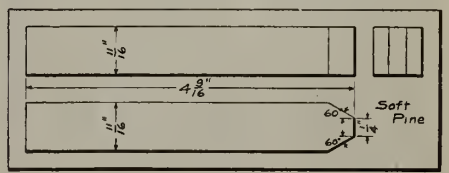


Fig. 1—Tie Plug from Tie Plug Forming Machine.

would require to be of the proper dimensions before coming into the hands of the workman. With this new machine, 25 plugs are produced at a time from a 4 x 4 in. piece of stock as rapidly as the operator can adjust the stock and operate the machine. The daily capacity of the machine runs up to nearly 100,000 plugs. It is the practice of the shop to operate it for some three or four days until a considerable stock has been formed to draw on, and then dismantle it until such time as a further stock is required. For those who do not know the use of these plugs, it might be mentioned that they are used for filling up the holes left by the rail spike when it is withdrawn for redriving in a more solid

portion of the tie when the section hands are repairing the alignment of the tracks. The exposed hole must be plugged if the subsequent decay of the tie at that point is to be retarded as much as possible.

Fig. 1 outlines the shape of the plugs. They are constructed usually of soft pine although at times the harder woods are employed for that purpose. The body of the plug is 11-16 in. square, tapering on two sides at one end with a 60 deg. slope to a ¼ in. point. The customary length is from 4 to 5 ins.

The machine in two stages of operation is shown in figs. 2 and 3. Essentially, there are three sets of saws operating in three planes at right angles to each other. The gang of saws to the rear in fig. 2 is carried on a horizontal shaft operating in bearings on a carriage that can slide vertically on the post to the rear. This carriage is kept normally in its upper position on the guiding ways by a counterweight at the rear of the carriage post, and is lowered by the operator by the cross lever at the top, on which the operator in the illustration has his hands.

Fig. 2—Tie Plug Forming Machine Ready for First Cut.

Fig. 3—Tie Plug Forming Machine Cutting off Finished Plugs.

On a stationary shaft immediately in front of the near side of these last saws there is a further gang of four saws revolving in a horizontal plane. To the near side of this gang there is a single stationary saw revolving in a vertical plane at right angles to the first gang of saws, supported near the outer end of the cross frame of the machine. On this cross frame there is a carriage on which the wood stock to be operated upon is clamped with the quick-acting clamps shown. This carriage for carrying the stock is operated along its guides by means of the large hand wheel below the operator at the rear through gears engaging a rack on the lower face of the carriage.

The operation of the machine is as follows:—With the rear gang of saws in their highest position and the stock carriage at the rear of its travel, the stock piece is pushed under the clamps against a stop on the vertical carriage at the rear, which may be noticed below that carriage under the rear gang of saws in fig. 3. When the stock is located endwise against this stop, and against the rear face of the carriage, the clamps are brought down on it. With the stock carriage in this position, the upper gang of saws is brought down through the stock, the four saws slotting the end of the stock into five sections. In the separating washers between these four saws, there are projecting cutters to give the 60 deg. bevel to the ends of the plugs of the shape indicated in fig. 1. The vertical slotting completed, this saw carriage is raised to its highest position. The operator then moves the stock carriage along the ways, meeting first the gang of four saws revolving in the horizontal plane, which slots the stock at right angles to the previous cut. Continuing the forward movement of the stock carriage as in fig. 3, the single saw cuts off the finished plugs, thus completing them in batches of 25. The carriage is then drawn back, the stock loosened and pushed forward as before to the stop, and the operations repeated. The capacity of the machine is limited only by the speed and dexterity of the operator

The diameter of the saws of the upper gang is greater than the depth of the cut to the inner bevelling cutter requires, so that the saw cut enters into the next section of the stock end. The reason for this is obvious, making it possible to continue the sharpening of the saws to a considerably smaller diameter than they originally had, without in any way affecting their usefulness.

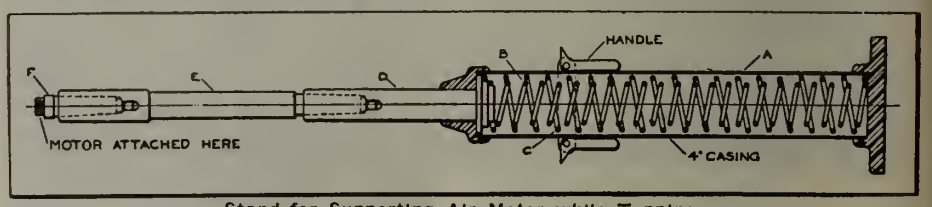
A further improvement to the machine is in contemplation. Pulling the vertically operating saw carriage at the rear up and down all day, as is being done in fig. 2, is fatiguing to the operator. To relieve him of this arduous part of the work, this carriage is to be power operated by means of cone clutches on one of the shafts when thrown into engagement revolving a vertical threaded lead screw for raising or lowering at will. Double cones will make it power operated in both directions.

J. J. McDonald, a G.T.R. conductor, was arrested in Toronto recently on charges of defrauding the company of fares, etc.

The Timiskaming and Northern Ontario Ry. commission has announced that it has adopted the ruling of the Geographical Board of Canada, as to the spelling of Timiskaming, and in future the name as referring to the railway will be so spelt, the folders, stationery and rolling stock being changed to correspond.

Stand for Air Motor Used by Pere Marquette Railroad.

The Pere Marquette Rd.'s mechanical department has devised a neat little scheme for bearing the weight of the air motor while the latter is tapping holes vertically upwards, as, for example, when tapping staybolt holes in the firebox crown sheet. As the illustration shows, the body or main part of the stand consists of a piece of 4 in. pipe, A, about 2 ft. long, having two wrought iron caps screwed on the ends. The cap to the right serves as a stand, while that to the left is longer and bored out to act as a plunger guide. Inside the 4 in. pipe casing there are two springs, B and C, formed of ¼ in. steel, and coiled to give a free length a few inches in excess of the length of the casing. Resting on these springs is the plunger D, guided in the upper head as before mentioned. The plunger D has a No. 4 Morse taper holding the socket E, various lengths of which can be made to accommodate the different jobs that must be undertaken, or else the one average length may be blocked up to the job in an improvised way. These sockets E, are also given a Morse taper No. 4, to hold the head F, which is threaded on its outer end to fit the handle end of the motor. The motor, being screwed on to this head, forms a solid and rigid unit, guiding the tap accurately into the hole.



Stand for Supporting Air Motor while Tapping.

All who have had difficulty from imperfectly fitting staybolts, due to the hole being ovalled from incorrect tapping by the old method of having the workman support the motor, will appreciate the value of this idea. In addition, the spring being of medium strength, keeps the tap right up into the hole, materially reducing the tendency of the tap to strip the thread before gripping. Consequently, a more perfect thread, less liable to leak, is made possible.

The Central Railway and Engineering Club, Toronto, held its annual outing recently, to Erin, Ont.

Remodelling of the C.P.R. Place Viger Station and Yards, Montreal.

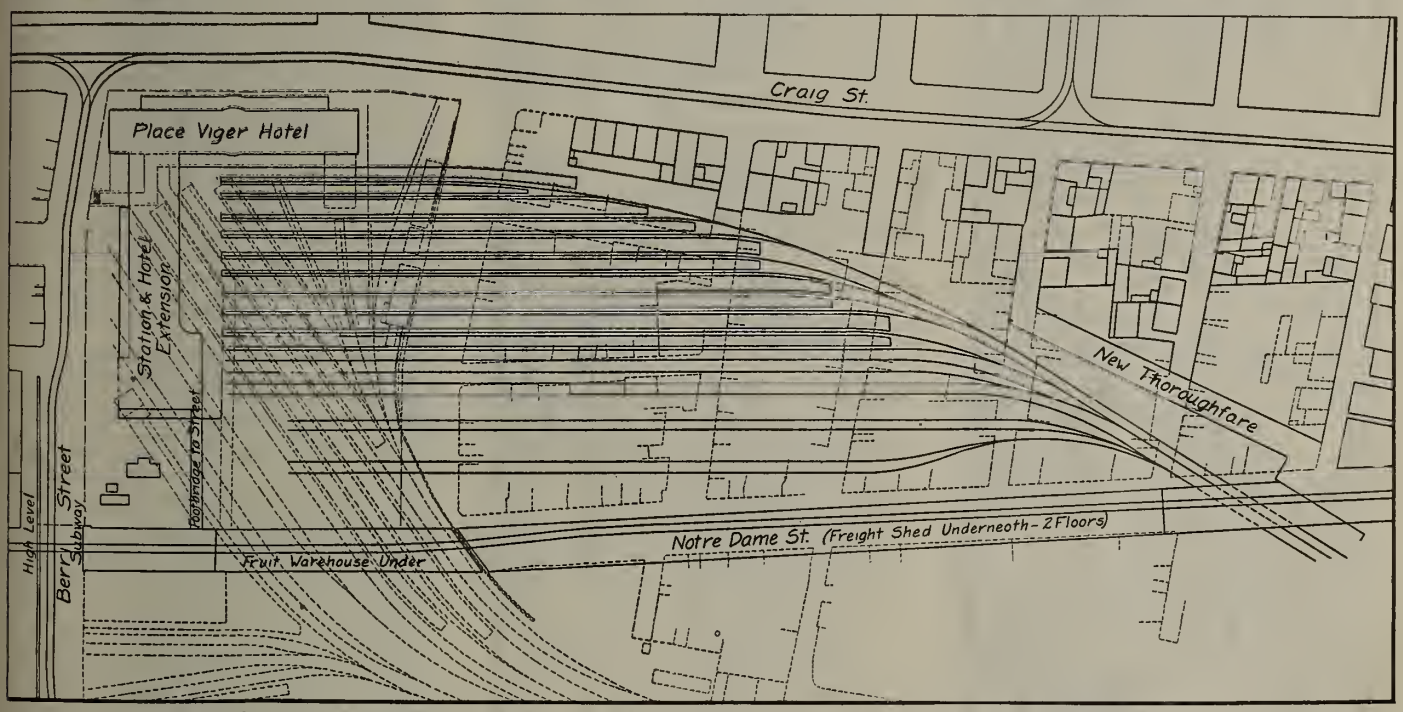
Most of the work of remodelling the C.P.R. Place Viger station and yards with a view to increasing their capacity and making them more convenient, has been completed, and the new arrangement in the immediate proximity of the station is shown in the accompanying plan. The new arrangement of the terminals and trackage is shown solid, and the old arrangement, now replaced, is shown dotted.

Formerly, the tracks entering the terminals from the right along the water front, branched off at an angle of about 45 degs. into the station yard, this arrangement taking up a great deal of ground without the best utilization of the space occupied. The station tracks were likewise not at all convenient to the waiting room. The freight shed space to the south, below Notre Dame street, was also very much cramped, and was not utilized to the best advantage, from the fact that most of the tracks were short spurs.

When the excavation had been completed, tracks were laid from the east end of the yard towards the then existing tracks, from which the traffic was then diverted. The old tracks being removed, the new ones were extended to the station building extension, which projects south from the old combined station and hotel. The station is now entirely separate from the old building, which is used solely for hotel purposes.

In the passenger terminals there are 10 tracks, with 10 platforms, accommodating 80 cars. A four track car storage yard provides for 48 more. Between the car storage tracks and the Notre Dame street bridge there are four freight tracks with a capacity of 83 cars, used for team freight. Under the bridge there is located a long 2 story shed for freight and fruit. This shed is served by a roadway on the north side and trackage on the south, which becomes a part of the new freight yard with terminal sheds at present under construction to the south of the bridge. This 2 floor shed under the bridge is used for bonded freight. It is 800 ft. long, and has windows and continuous sliding doors on the track side, and 20 separate sliding doors on the team side. The sides are galvanized iron, supported on a steel frame. The fruit shed at the west end of this freight shed is built under the old portion of the bridge, and is heated, so that fruit shipments can be properly handled both winter and summer.

The freight yards to the south of the bridge, which are now nearing completion, will contain long freight sheds parallel to the street, occupying the ground right down to the Harbor Commissioners' property, the whole yards occupying a space nearly three times as great as that portion shown in the illustration above Notre Dame street.



Old and New Arrangements of Terminal Facilities at C.P.R. Place Viger Station, Montreal.

The plan of enlargement made a radical change in the terminals, it being determined that the best arrangement under the circumstances would be to bring the tracks in parallel to Notre Dame and Craig streets, for which purpose considerable property surrounding the yards had to be purchased, the extent of this land absorption being indicated by the dotted blocks in the illustration.

Notre Dame street originally ran along the crest of a rise in the ground parallel to the shore line, between the shore line and Craig street. In the old arrangement, the tracks came through from the shore line to the Craig street level by cutting through this mound, and carrying the highway across on a bridge. The new arrangement necessitated the reduction of the ground level over the whole area of the new terminals, to the level of the former trackage, so that Notre Dame street is now carried across the lowered yards on a viaduct, beneath which are freight sheds. Notre Dame street was temporarily diverted while the excavation work was being pushed forward. The street on the viaduct is at practically the same level as before.

W. J. Chapman, formerly assistant timekeeper at the C.P.R. freight sheds, Fort William, Ont., has been charged with the theft of $1,017.51, by means of irregularities in the pay rolls. He was arrested in San Francisco.

H. W. D. Armstrong, M. Can. Soc. C.E., Chief Engineer, Fredericton and Grand Lake Ry., Fredericton, N.B., writes,— "I must congratulate you upon the increasing volume and value of the Canadian Railway and Marine World."

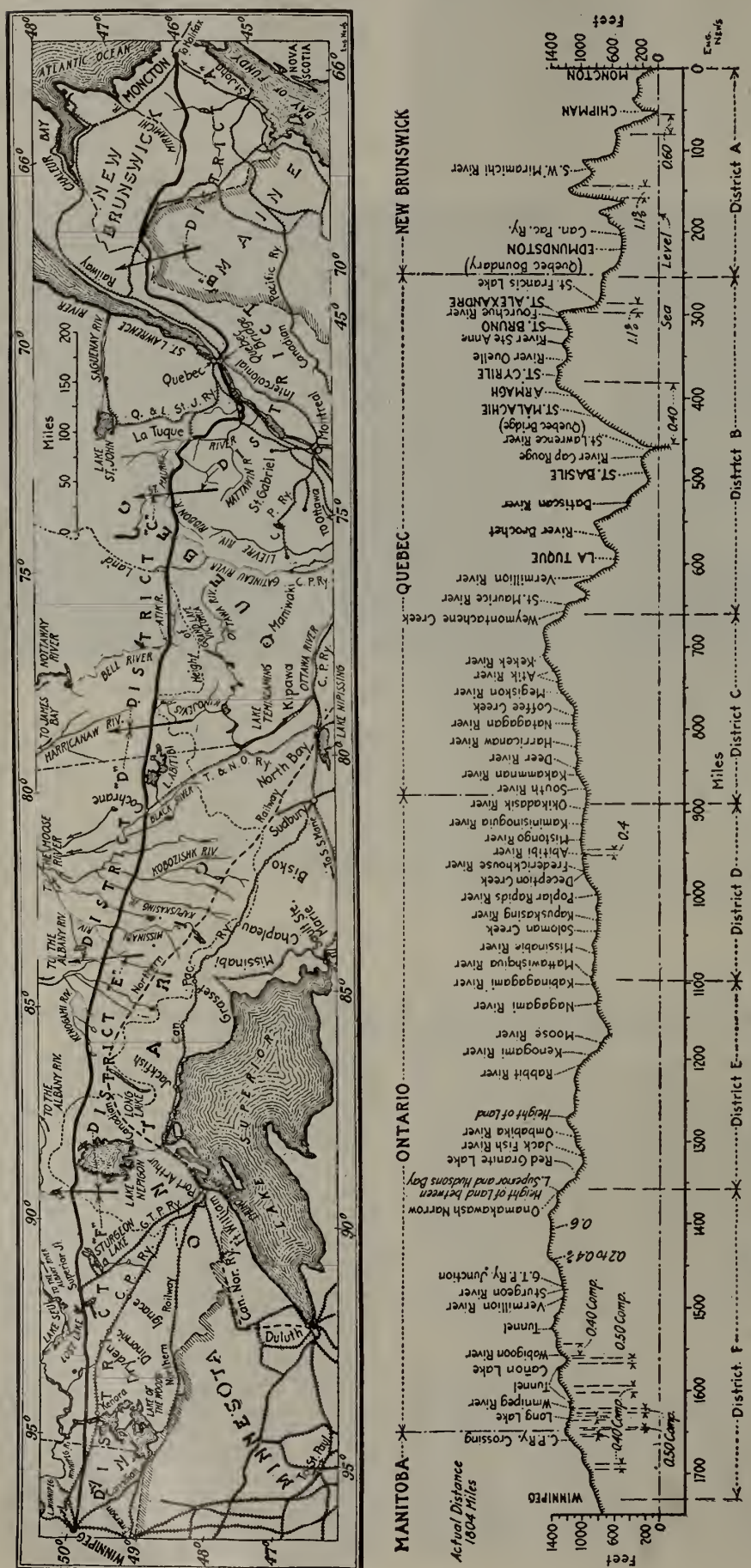
The Diesel Locomotive.

In a recent address before the American Society of Mechanical Engineers, wherein he described the progress being made with the acceptance of the Diesel engine as a standard means of developing power, Dr. Rudolph Diesel, the inventor of this type of internal combustion engine, described a locomotive constructed the early part of this year in Germany in which the Diesel engine is the motive power. The locomotive in outward appearance closely resembles an all-steel car, and weighs 85 tons. The wheel arrangement is of the 4-4-4 type, two Diesel engines set at an angle of about 45 degs. at the centre of the car driving on to a jackshaft between the two pair of drivers, this jackshaft being the crankshaft of the engine. Connecting rods from the jackshaft drive the driving wheels. Between these two inclined cylinders, there are two scavenging air pumps driven from the same shaft. Two horizontal air cylinders on the floor in front are driven from two small vertical Diesel engines, this compressed air being used to increase the power of the engine by increasing the area of the indicator diagram, the process being new. The air is stored in cylinders near the other end of the car, where are also located the cooling water tanks. A large muffler in the top of the car subdues the blast of the exhaust.

Dr. Diesel gave what in his opinion are some of the reasons for the slow adoption of the Diesel engine in America. The causes assigned include cheap coal, cheap engines, lack of capital, and generally good profits without undue thought concerning economy. These reasons stand out prominently in comparison with Europe with its world competition.

An obstacle to the use of the internal combustion engine for hauling trains has been the impossibility of accelerating the train from standstill with an engine of normal size and of maintaining any considerable overload at any speed. A petroleum electric locomotive is now proposed, in which the prime mover is an internal combustion engine, using crude oil, kept continuously running to drive an electric generator, which in turn delivers electrical energy to four 220 h.p. polyphase motors.

The Construction of the National Transcontinental Railway.



Figs. 1 and 2. Map and Profile, National Transcontinental Railway, Moncton, N.B., to Winnipeg, Man., 1,804 miles.

In 1902 a company was formed in Quebec to build a railway from Atlantic tidewater, on the Saguenay River, to Port Simpson, on the northwest coast of British Columbia. The line was to be known as the Trans Canada Ry. In the following winter, three parties were placed in the field, one at either end, and the third party north of Lake Winnipeg. Several hundred miles were surveyed and some knowledge of the character of the country was obtained. Early in 1903, the newly formed Grand Trunk Pacific Ry. Co. took over the scheme and the parties were recalled. A new and more southerly route was then projected, extending from Winnipeg westerly to Edmonton, and thence to some undetermined point on the Pacific Coast, and easterly from Winnipeg to a junction with the Grand Trunk Ry. at North Bay, on Lake Nipissing.

This easterly division swung north along the waters of Lac Seul and the Ogoki River as far as the 88th meridian before turning southeast. It penetrated a country little known, and uninhabited except by a few scattered families of half-starved Ojibways. A reconnaissance was made over the whole route as projected, which included a branch from Lac Seul to Fort William, on Lake Superior. Ignorance of the country, shortness of supplies, lack of transport facilities, and outbreaks of scurvy were among the difficulties with which the parties had to contend. A few caches had been established at isolated points, but, for the most part, supplies were brought in with the parties and replenished from the nearest fur-trader's outpost or Hudson's Bay Co. post.

In 1904 the Dominion government appointed the National Transcontinental Railway Commission to take over and build the line from Moncton, N.B., to Winnipeg, Man. The Grand Trunk Pacific Ry. is building west from Winnipeg to the Pacific Coast and will operate the entire line from Moncton, N.B. Under this commission the route of the eastern division was again changed and a year was spent on new surveys and the study of those already made. It was then laid out to skirt the north shores of Lakes Nipigon and Abitibi, continuing in the same general direction to the headwaters of the St. Maurice River, crossing the latter near Quebec, and proceeding thence in as direct a line as possible, without leaving Canadian territory, to Moncton, at the southeastern corner of New Brunswick. There it connects with the Intercolonial Ry., which is owned and operated by the Dominion Government and which extends to the Atlantic ports of St. John, N.B. and Halifax, N.S.

While contracts were let and construction was commenced at Winnipeg and Quebec as early as 1906, final location through the remote districts of northern Quebec and Ontario was not completed until late in 1908, and revisions have since been made from time to time. Before the most economical location was staked out, before even a satisfactory line could be projected, an enormous belt of country had to be explored and mapped. From Lake Nipigon eastward to the St. Lawrence valley, two main routes were selected for exploration. The one eventually adopted has been described above. The other followed a more or less direct line, passing close to the south shore of Lake Abitibi, touching the north end of Grand Lake Victoria, an expansion of the Ottawa River, and proceeding thence across the Gatineau and Llevre Rivers to the Mattawan and St. Maurice. An alternative route in New Brunswick, by the St. John River valley, was also surveyed.

The total distance from Moncton to

Winnipeg was estimated to be about 1900 miles, on what was assumed to be the most direct feasible route. The problem of definitely locating this route was not an easy one, as for more than half the distance the line of general directness ran through an unsurveyed, unsettled and practically unknown region cut up in all directions with a network of lakes and rivers, many of them not shown on any existing maps, and when so indicated, often found to be entirely misplaced. The engineers, had, therefore, in many cases to make their own maps, as the surveys proceeded, and had in all cases to correct and complete existing maps.

SURVEY WORK AND LOCATION.

During the autumn of 1904 and the following spring, some 34 survey partles were equipped and sent out, and before the end of 1905 there were 45 parties in the field, consisting of about 18 men each, not counting a large number of men engaged in transporting supplies by canoe and packing in summer and by dog train in winter. Each survey party had an engineer in charge, transitman, leveller, topographer, draughtsman, rodman, picketman, two chainmen, cook and eight or nine axemen and packers. Each party was given certain governing points to connect, and was instructed to thoroughly exhaust the possibilities for the most favorable and reasonably direct line between these points. Barometric explorations and compass lines were followed by preliminary lines run with transit, and plans were plotted with 10 ft. contours on a scale of 400 ft. per in.

With those plans, and with profiles on the same scale, projected locations were made on the most favorable lines and afterward actually run on the ground and called a "first location." These plans and profiles were plotted in the field, and tracings (with reports) were sent to headquarters monthly. These reports were carefully gone over by the Chief Engineer and Assistant Chief Engineer, necessary changes suggested, and instructions issued accordingly. Whenever the head of a party completed what he considered the best possible "first location," the engineer in charge was changed and another man given a chance to improve the line by making his best attempt at a revised location. The original head of the party, or a third man, was given a chance to still further revise for a final location. In this way it was found that a healthy rivalry was established and good results obtained. Revision of location is, however, never considered as finished until construction is well under way, as it is often found, after the line is cleared, that slight changes will effect a very considerable saving.

An equation table giving definite values for savings in distance, curvature, rise and fall, etc., was furnished all parties in the field, so that, having the estimated cost of construction of any two or more lines, the better one to adopt from all points of view could be at once determined. This table is given further on.

The earlier explorations and reconnaissances were made by compass and barometer, followed by transit with stadia, or chain and level. Steel-band chains were used for distances in final location. The parties consisted usually of 18 men in settled districts to 24 men in unsettled districts, six of the latter number being packers. In general, they were sent into the field in pairs, at intervals of about 80 to 150 miles, with instructions to run, respectively, east and west from some more or less well defined point. In the more remote localities, it was found impossible to fix these points at all accurately, owing to the non-existence of reliable maps; nor could the course of the indicated route be followed closely owing to the presence of some unsuspected large body of water or other topographical obstruction. Consequently, much difficulty was encountered in joining up the surveys of two approaching parties. At the head of the St. Maurice, the Tete de Bulle Indians were found to possess an unusual aptitude for cartography, and by following their rude maps, a junction was effected with the party running east from the Gatineau.

Working in a country so cut up with lake and river expansions as to be more than 50% water, absolutely unmapped and unknown, and some 250 miles from the nearest railway, two parties overlapped several miles, one being 10 miles north of the other, before communication was established between them and a connection made. A rough stadia traverse, 80 miles long, following the old Indian canoe route from Lake Abitibi to the Kenojevis River, and occupying 11 days, furnished course and distance between surveys which had started nearly 200 miles apart. In the Kenogami District, one of the earliest G.T.P. Ry parties exhausted their provisions, and searched three days without finding a line, which had been blazed north from a supply cache, to which they tied in their reconnaissance. They left behind them as a record of their experience a string of lakes bearing the suggestive names: "Storm," "Ice," "Poverty," "Stampede" and "Relief." By discharging ship's rockets simultaneously on a pre-arranged night, quick connections were in several instances effected across unsurveyed gaps.

Observations for latitude were made, of course, but as there were at the outset no means of intercommunication between the parties in remote localities, other than through the district head quarters, on the C.P.R., months elapsed before these could be interchanged.

VALUES FOR EQUATING DISTANCE, ETC., IN LOCATION.

It has been noted above that field parties were furnished with equation tables showing definite values for savings in distance, curvature, etc. The values given below were used in the final determination of location. Tables 1 and 2 give the values for distance and rise and fall. For calculating the justifiable expenditure per mile, 10 daily trains each way (equal to 20 daily trains) were assumed for the line between Moncton and Quebec, and also between Winnipeg and the junction with the branch to North Bay; between other points 12 daily trains were assumed. Justifiable expenditure per mile takes into consideration maintenance of rails, ties, ballast, etc.

ASSUMED COSTS PER FREIGHT TRAIN MILE, Engine Mile, Etc.—Train mile, $1. Engine mile, 35c., both assisting and running light; 40c. if assisting both ways, with no light running. Minimum cost for assistant engine when not at division point or used for yard work, $18 per day or $6,600 per annum. Light running 25c. per engine mile. Switching 30c. per engine mile. Doubling grades, 90c. per engine mile straight distance, or 45c. per additional engine mile.

TABLE 2.—VALUE FOR EQUATING RISE AND FALL (ALL TRAINS).

(Freight train velocity limits: max., 30 m.p.h.; min., 10 m.p.h.)

Class	Value per ft. rise and fall per daily train	Capitalized value per annum	Justifiable expenditure per ft. of saving in rise and fall for 12 daily trains per ann.	Justifiable expenditure per ft. of saving in rise and fall for 20 daily trains per ann.
A. Minor grades ..	$0.12	$3	$36	$60
B. Minor grades ..	0.48	12	144	240
B. Ruling grades..	0.88	22	264	440
C. Minor grades ..	1.00	25	300	500
C. Ruling grades..	1.40	35	420	700

A. All rise and fall up to 30 ft.

B. Where grades require shutting off steam, but not application of brakes in descending. This class includes all rise and fall of over 30 ft. on grades less than 0.6%, and between 30 and 100 ft. on 0.6% grades and steeper grades of small drop not covered under Class C.

C. Where grades require the application of brakes and shutting off steam in descending. This class includes all rise and fall of over 100 ft. on grades of 0.6% and a proportionate fall on steeper grades.

VALUES FOR RAILWAY GRADE CROSSINGS—Justifiable expenditure to save one normal grade crossing of another railway, $40,000.

TRANSPORTATION AND SUPPLY.

Much of the early organization had to do with transport and supply problems. Through New Brunswick, Manitoba and the settled portions of Quebec existing railways, roads and steamship lines gave easy access to all parts of the line. LaTuque (at the head of navigation on the St. Maurice River), St. Gabriel, Maniwaki and Kipawa (terminals of the C.P.R. branch lines), and North Timiskaming, at the extreme end of the lake of that name, were the points of departure from which radiated canoe routes to the vast wilderness of northern Quebec. Between Lakes Nipigon and Abitibi, the Moose and Albany Rivers spread their finger-like branches southward to within short distances of the C.P.R. main line, furnishing water routes which were reached by canoe and portage from Bisco, Woman River, Chapleau, Missinabi, Grassett, Montizambert and Heron Bay. Lake Nipigon affords comparatively easy access to a hundred mile stretch across its northern dralnage area; while to the west, Ignace, Dinorwic, Dryden and Kenora were used as shipping points to Sturgeon and Minnitaki Lakes, and the Wabigoon and Winnipeg Rivers.

In the autumn of 1904 and winter of 1905, from 40 to 50 completely equipped parties were placed in the field between

TABLE 1.—VALUE FOR EQUATING DISTANCE.

Class.	Train mile	Value per ft. per daily train per annum	Capitalized value per daily train per ft.	Capitalized value per daily train per annum per mile*	Saving per daily train per annum per mile of short-ening.	Justifiable expenditure per mile of saving in distance per annum for 12 daily trains	Justifiable expenditure per mile of saving in distance per annum for 20 daily trains
A	0.30	2.0c.	$0.50	$2600	$104	$31,200	$52,000
B	0.50	3.4c.	0.85	4500	180	54,000	90,000
C	0.60	4.0c.	1.00	5300	212	63,600	106,000
D	1.00	7.0c.	1.75	9200	368	110,400	184,000

*Capitalized values per mile to nearest $100 and interest 4%. One daily train each way equals two daily trains.

A. Distances so short as not to affect track or train wages, aggregating less than two miles.

B. Distances affecting train wages, but not so great as to affect the number of stations or sidings. From two to five miles.

C. Distances so great as to affect number of stations and sidings required. From 5 to 75 miles.

D. Distances so great as to affect number of engine districts. Over 75 miles.

VALUES FOR EQUATING CURVATURE (ALL Trains)—The elimination of 1° of curvature will save 16c per daily train per annum (including passenger and freight trains); equal to a capitalized value of $4 per degree. Justifiable expenditure per degree of saving in curvature; $48 for 12 and $80 for 20 daily trains. If a curve is in a particularly dangerous place, which necessitates a watchman or other additional expense, the value of its elimination must be considered separately. One degree of curvature means one degree of central angle, regardless of radius of curve. It is assumed that expense due to curvature is in proportion to the total central angle.

Moncton and Winnipeg. Some of these hardly reached their destination before being overtaken by the freeze-up, and were forced to return and cut trails in order to bring up sufficient supplies to carry them over the winter. A transport department was organized, and as soon as the condition of the roads and lakes permitted, large quantities of provisions and outfit were pushed north to the furthest limit of lumbering operations over existing bush roads, and stored in main transport depots, or in warehouses of the Hudson's Bay Co. From these, part of the supplies were forwarded by dog sleigh and packer, and the balance distributed by canoe after the ice had gone out in the following June.

Caches were established from time to time at intervals of from 20 to 40 miles; log shacks were erected and a couple of men placed in charge of each. These were generally located on some canoe route, and being maintained permanently, as long as the surveys lasted, constituted an important aid in their prosecution. Regular systems of mail service were provided later, following the supply routes, but during the long freeze-up, lasting from about the middle of October to the middle of December, and to a less extent throughout the break-up, extending over the greater part of April and May, insecurity of ice on river and lake practically put a stop to communication with the outside world. Throughout most of Quebec and western Ontario, innumerable waterways, many of them rendered navigable for canoes by beavers, provided an easy method of moving camp. But across the interminable muskegs and spruce-covered swamps of the clay belt, parties had in summer to depend solely on the tump line to pack their supplies and outfit.

Medical officers were stationed at wide intervals, but there was little sickness that could not be cured by a blue pill. The most serious discomforts endured were black flies in summer, and a few intensely cold days in midwinter when the mercury sometimes touched 60° below zero. Accidents due to upsetting canoes and breaking through ice were unfortunately, too common. In the first three years of the survey, 27 lives were claimed by the frigid waters of river and lake, at that time the only highways. Narrow escapes were of almost daily occurrence. On several occasions, parties were caught by the freeze-up on their way out, canoes being abandoned, and treacherous river crossings negotiated on hands and knees. Two men tried to run a 30-ft. chute on the Gatineau. One jumped on to a rock, and the other was rescued with difficulty from the pool below after the canoe had been dashed to pieces. Another canoe broke in half while descending the Woodchuck rapids on Bell River, and the occupants paddled five miles into camp seated one in either piece.

GRADES AND ALIGNMENT.

At the outset it was decided that the railway should conform to a high standard. Grades were not to exceed 0.4% opposed to eastbound traffic (which is the heavier), nor 0.6% against westbound traffic. The curvature was limited to 6°, and all curves of 1° and over were connected to their tangents with easy spirals. The 6° limit for curves was used only where topographical conditions prevented easier curves being used at reasonable cost. Grades were compensated for curvature at the rate of 0.4% per degree, so that on 6° curves the maximum grade (eastbound) was 0.16%. Vertical curves were introduced at summits and sags, the rate of change in grade being 0.1% and 0.05%, respectively.

Pusher grades were adopted at two points only and are quite short. The whole line between Moncton and Winnipeg (with the slight exception of short approaches to the Quebec Bridge on 1% grades) was definitely located with the above mentioned very easy maximum grades But 146 miles from Moncton, it was found that by the insertion of about 12½ miles of 1.1% grade adverse to eastbound traffic, a saving could be made of 17.2 miles in distance, nearly $2,000,000 in construction and $1,250,000 in capitalized operating value. At another point (in Quebec) 286 miles from Moncton, a similar grade 10 miles long, adverse to eastbound traffic, was found to effect a saving of 18.8 miles in distance, about $500,000 in construction, and over $750,000 in capitalized operating value. These possibly temporary grades were adopted with the corresponding saving in distance and cost. If the future traffic of the road justifies the expense, these two short links of standard grade can be built at any time.

In comparing rival routes, values based on assumed capitalized cost of maintenance and operation were given to savings in distance, curvature, and rise and fall as noted above. Owing to the locality traversed, artificial values for these, due to competition, seldom had to be considered. Distance was evaluated at $6 to $35 per ft., depending on amount saved and expected traffic; curvature at $48 to $80 (or more) per degree; and rise and fall at $36 to $700 per ft. on long maximum grades requiring the application of brakes in descending.

Throughout the 1800 miles between Moncton and Winnipeg the geographical characteristics, and consequently the engineering problems, varied greatly. The short rout across the broken topography of New Brunswick necessitated long stretches of maximum grade and development for distance, culminating on the slopes of the divide between the Miramichi and St. John Rivers. Even with a short pusher grade of 1.1% eventually adopted here, cost of construction was very heavy. This included a tunnel and 3918 ft. of viaduct, 193 ft. high, over the Little Salmon River. A pusher grade was also required to negotiate the summit between the St. Lawrence and Bay of Fundy waters, near the extreme northern corner of Maine. In southern Quebec, the line parallels the St. Lawrence River, 20 miles inland, before swinging north to where the substructure for the new Quebec Bridge is rapidly nearing completion. Just beyond, another great viaduct, 3000 ft. long and over 160 ft. high, was required to span the gulch of Cap Rouge. Three of the piers for this was sunk by pneumatic caisson, one to a depth of 55 ft. below high water.

LOCATION AND ROUTE NORTH OF THE ST. LAWRENCE.

Perhaps the most difficult problem confronting the locating engineers, on the whole eastern division, was to find a path through the forbidding range of hills loosely called the Laurentian Mountains, which forms the northern watershed of the St. Lawrence River. Some 80 miles west of Quebec city this range is abruptly cleft, enabling the St. Maurice River to carry south the accumulated drainage of 15,000 sq. miles. Three alternatives were proposed: 1, to develop a line up one of the more easterly streams until sufficient altitude should be attained to cross over into the St. Maurice valley and follow this to its upper waters; 2, to enter this valley at its lower end, cross it, and attempt to reach the hinterland by way of the Mattawin or Riviere aux Rats, two of its main tributaries from the west, or 3, to proceed further up the St. Lawrence, and pierce the Laurentian at some more westerly point, avoiding the precipitous cliffs of the St. Maurice.

All of these routes were explored. The third, apart from other objections, proved too long. The second and most direct was reported against on account of the excessive slope in the lower waters of the valleys explored, the difficulty of developing distance within their narrow confines, and the great cost of bridging the lower St. Maurice. The approved route followed up the rivers Batiscan and Brochet, until a pass was reached over-looking the hamlet of La Tuque, at the head of navigation on the St. Maurice, where the latter turns from southeast to south. The descent was effected by fitting a two-mile horseshoe curve into a recession of the hillside.

Beyond La Tuque, the waters of the St. Maurice come down 80 miles from the old Hudson's Bay post at Weymontachene, dropping 700 ft. in a series of cataracts and turbulent rapids. Its course is fairly direct, except for a long detour to the north around the 16 miles of air line between the mouth of the Vermillion and CooCoo Cache. Four miles above La Tuque, the main river is bridged by six 140-ft. trusses, on concrete piers and the precipitous side hill is followed to Vermillion. Here, after repeated efforts, a circultous route through the long granite ridge was located in CooCoo Cache, and the St. Maurice again followed to Weymontachene.

From Weymontachene to the Gatineau River, the obvious route appeared to be via the Ribbon River, but a 10-mile saving in distance was effected across from its mouth to its upper basin. However, this involved two semi-loops, a 100,000 yd. summit cut and several others of slightly less magnitude. The first preliminary west of the Ribbon struck far to the north, via Haircutting Lake, avoiding the Gatineau valley altogether. Later the east branch of this was crossed and the sinuous line between interlacing waters of the St. Maurice and Gatineau roughly followed to where it intersects the height of land, 50 miles beyond.

Innumerable lakes and creek expansions, separated by irregular ridges of sand and boulders, covered with jackpine, here constitute the outstanding features of the topography. So intricately interwoven are these, that the country had to be criss-crossed with lines for a width of 20 miles before a satisfactory alignment could be obtained, with a profile showing only moderately heavy work. Similar conditions prevailed for a further distance of 25 miles to the Atik River, which was followed to its junction with the Megiskan, a branch of the great Nottaway. This region was the most inaccessible and least known on the whole line, and will be the last to be completed.

While the St. Maurice valley was being explored from the Quebec end, engineers sent north from Ottawa, North Bay and western points, had made the unexpected discovery that the country beyond the height of land presented far fewer difficulties than that draining into the St. Lawrence. Accordingly, late in 1905 the route south of Lake Abitibi was abandoned.

The actual height of land is crossed three times in northern Quebec, and twice in northern Ontario, with elevations above mean tidewater of 1500, 1070, 1075, 1120 and 1260, respectively. At all of these points except the most westerly, the work is light. From the Megiskan River to Lake Nipigon, occurs a vast spruce-covered plain, of which the soil is a deep agricultural clay, interspersed with a few sand ridges and isolated outcrops of rock, and covered in many places by from 1 to 10 ft. of muskeg. That part east of Lake Abitibi (a shallow and muddy expansion of the Abitibi River, 400 sq. miles in extent) is intersected by the sluggish waters at the sources of the Nottaway and Harricanaw Rivers. The western portion, on the other hand, is drained by swift flowing branches of the Moose and Albany Rivers, so numerous as to require a bridge on an average every sixth mile, not counting arch culverts up to 30 ft. span. These show on the profile as deep gulches, separated (except for an occasional long shallow cut) by mile after

mile of surface line within a few feet of subgrade.

The alignment throughout this section is exceptionally direct. For 250 miles westerly from Lake Abitibi, the length of preliminary location exceeded the air line by less than 4%; it contained only six curves of 3° and none over 3°. The first G.T.P.R. reconnaissance, run in 1903, between the Kenogami and Missinabi Rivers, was a straight line 115 miles long. On final location some of the very long tangents were broken up to obtain more favorable river crossings, but several stretches of 16 to 18 miles were retained.

North of Lake Nipigon, granite ridges alternate with flat stretches of muskeg and clay. These latter occur with decreasing frequency as the line crosses the height of land for the last time to enter the rock-ribbed and unproductive wilderness which forms the barrier separating the farm lands of eastern Canada from the prairies. With the exception of a short tract of indifferent agricultural soil, between Lost Lake and the Wabigoon River, the country is barren and desolate, much of it having been denuded even of its original growth of stunted spruce.

An enormous number of irregular bodies of water lie scattered over its surface, many of them with shores deeply indented, and buttressed by rugged cliffs. In the vicinity of Onamakawash Lake, along Canyon Lake, and on both sides of the Winnipeg River, the rock cuts were exceptionally heavy. Embankments of even larger size had also to be made of rock borrow and train-hauled material. Corresponding conditions prevail along the line of the C.P.R., and repeated surveys showed that no improvement could be effected by adopting a still more northerly route. The last 50 miles into Winnipeg is, for the most part, through settled prairie country. By crossing and keeping south of the C.P.R., the worst portion of the deep Julius muskeg, which required years to fill, was avoided.

CONSTRUCTION WORK.

Actual construction began in the spring of 1906, contracts having been signed for the building of 150 miles from Quebec west, and 245 miles from Winnipeg east. The latter portion was to a connection with the branch to Fort William (then under construction by the G.T.P.R.); thus giving a line from the wheat district to Lake Superior. From time to time additional sections were let, until by October, 1908, the whole line was under contract. Supplies for constructing the most easterly 850 miles were distributed from various points on the Intercolonial, Canadian Northern C.P.R. and other railways. The extreme western end was also easily accessible by steamer and short winter road from various points on the C.P.R. as far east as Dinorwic. The central portion was opened up east and west from La Tuque, the Timiskaming and Northern Ontario Ry., Lake Nipigon, and the Thunder Bay branch of the G.T. Pacific Ry.

Steel on the Quebec and Lake St. John branch was laid into La Tuque early in 1907. About the same time the T. & N. O. Ry. ran its first train into McDougall's Chutes at the head of navigation on the Black River, a tributary of the Abitibi. From here, two main transport routes were established. One extended upstream into Abitibi Lake. The other followed down the Black and Abitibi Rivers, to where the new line crossed the latter, beyond which a monorail tramway was constructed 8 miles across country to the Frederickhouse River. The tramway was operated by a platform truck having shafts attached to a pole at right angles to the rail. The horse thus walked alongside the car and rail, the car being guided on the rail by double-flanged wheels. A service of steamers and gasoline boats was established on each route, short stretches of light-rail tramway being built around the worst rapids. Push roads were also cut to provide winter communication. Later, when the T. & N. O. Ry. had extended its line 40 miles to a junction with the National Transcontinental Ry. (where the town of Cochrane now stands), the steel was laid east and west over the new grade, these routes were abandoned.

Meanwhile the G.T. Pacific Ry. had finished its branch from Fort William to Sioux Lookout, with a spur into Sturgeon Lake. This extended the field of operations, and gave impetus to that part required to connect Winnipeg with the Great Lakes. In the summer of 1908, a narrow gauge railway, 18 miles long, was constructed around the rapids of the Nipigon River, and before navigation closed that year, a considerable quantity of supplies had been distributed along the north shore of Lake Nipigon by steamers built for the purpose. In the following year an attempt was made to establish a similar transport route from Jackfish over the height of land, into Long Lake, and thence down the Kenogami River. This failed, owing to the inability to secure reasonable grades up the steep ascent from Lake Superior, except at prohibitive cost.

It was accordingly decided that the 350 miles between Cochrane and Lake Nipigon should be covered from either end. By Dec. 1910, 40 miles at the west end of this was graded and track laid for over 100 miles at the Cochrane end. Two months later a winter tote road was completed across the remaining distance, and sufficient supplies and outfit to grade all but a few cuts were distributed in log warehouses erected at intervals of about 20 miles.

GRADING.

As most of the work was of the lightest description, chiefly side casting, the construction plant consisted almost entirely of shovels and wheelbarrows, with a few tons of light rails, some car wheels and a load or two of explosives for loosening frozen clay, and breaking up boulders. This light work was practically finished by Oct., 1911, and up to the end of Feb., 1912, 20% of the balance of the excavation had been completed.

In the heavy rock districts work, of course, proceeded much more slowly. The usual methods of blasting were employed: 1, block holing, loading with dynamite and firing with time fuse, in the smaller cuts; 2, heavy springing, loading partly with black powder and discharging with battery in the larger cuts, or where it was desired to break up and waste several thousand cubic yards at once; 3, tunnel blasting, or "coyoting." For this latter work, the station man was usual paid per lineal foot for shafts and tunnels. In loading these, the high explosives were sometimes left in the case, but the blast was usually more effective if the cartridges were removed from the boxes. Frequently 6000 cu. yd. or more of rock were broken up by one of these blasts. Where the expense of bringing in cars and track was excessive, the shattered rock or muck was removed by stone boat on pole track, the poles being well iced in winter, or lubricated with black oil in summer.

Deep clay cuts in the Abitibi region were excavated with less expense in winter, as in summer horses could only travel in the greasy blue gumbo after the cuts (and often the fills as well) had been corduroyed. But in the winter, so long as the work progressed steadily, even in the coldest weather, the cut did not get time to freeze deeply in a single night, and the frozen top could be undermined or broken down with a few sticks of dynamite. A slight additional expense was incurred in winter by shovelling snow away from the base of the dump.

Much of the grading in New Brunswick and Quebec was performed with steam shovels having dippers of ½ yd. to 2½ yd. capacity. These were hauled into the work in winter with their necessary complement of dinky engines, cars and track. Some of the smaller machines were similarly used in northern Ontario. Scrapers, both wheel and slush, were employed on the prairie section, and elsewhere generally for light sandy work, a few being sent in across Lake Nipigon. An elevating grader was tried in the Abitibi country, but was soon discarded, as the horses mired in the sticky clay.

SLIDES.

Slides were numerous throughout the clay belt. These occurred, to some extent, in the sides of cuts, which frequently required a slope of 1 on 2 or even flatter. Much more serious, however, were those which took place under deep fills and behind concrete abutments. At Brule Creek and the Okikodasik and South Rivers, heavy concrete structures on poles were moved bodily out of place, but the shifting from original position was not sufficient to prevent the erection of the steel superstructure after movement had stopped. In some instances it appeared probable that pressure behind the concrete had deflected the piles laterally through the yielding clay; in others, that the slip had occurred on an inclined plane below the level of the foundations.

At the little Mistongo, a long 6-ft concrete arch was built on pile foundation, and the deep gully bridged by a light trestle, from which material excavated in an adjoining cut was dumped. Some of this, in wet weather, simply flowed away in a river of mud. After several slides had occurred, which broke up and buried the culvert, sweeping three or four trestles in succession down the slope, the fill was completed in winter, a large square box culvert of heavy timber being built to replace the arch culvert. With the freshet, the embankment again settled, and a small lake formed on the upstream side, from the middle of which protruded one end of the timber culvert, standing upright. Continuous filling at length brought the embankment up to grade, the water being at first pumped and siphoned over the top, and later carried of through a reinforced concrete pipe built permanently through the bank and having a long extension at the downstream end.

BRIDGES AND CULVERTS.

On completion of the main surveys, small parties were sent over the line with instructions to take soundings where any openings were to be left. A light boring machine was used, by which casing pipe screwed together in sections was forced down through the river bed, and the core broken up with the drill, and removed by means of a rope attached to a short tube with ball valve. At the Manuan River, this machine was set on the ice, and the casing driven by an improvised pile driver, consisting of a section of green birch for hammer, working between leads and operated by transport dogs. When the ice went out the machine was transferred to a raft, and the dogs harnessed to the spokes of a windlass. By this contrivance, pipes were driven through 50 ft. of hard compacted sand.

The treacherous soil of the clay belt was the cause of a great deal of trouble in securing stable foundations, especially when attempting to excavate in midstream. A coffer-dam for the main pier of the Abitibi bridge, consisting of 4 ft. of puddle, between an outer row of 12-in. ordinary sheet piling, and an inner row of Wakefield sheet piling, 18 in. wide, failed to prove watertight. Eventually a continuous lining of steel sheet piles was driven around the inside and left in the work. The cofferdam was then partly unwatered, and material squeezed up by the foundation piles excavated with an orange-peel bucket to slightly below the river bed. Concrete for this pier was laid in mid-winter, much of it under

water, being prevented from freezing by the injection of steam. Fig. 4 and 5 show work at this pier. A cofferdam of sand bags at the Mattagami was used, with indifferent success.

When possible, long spans were used to avoid foundations in midstream where clay was encountered in the river bed. For shore foundation pits, round logs were generally used to prevent caving in, as sawn lumber was expensive or unprocurable where such pits were dug ahead of the steel. Tresties of unsquared timber were erected at most of the openings where a bridge or culvert was required. They were constructed of the largest timber in the vicinity, irrespective of variety, even cottonwood being used. For the longer stringers, however, British Columbia fir was imported. These trestles were of the most temporary character, and in a few cases failed to withstand the impact of outgoing ice during the spring freshets. They served, however, to push the track ahead, so that steel and cement could be brought in for the permanent structures.

Concrete was almost universally employed for substructures. This was partly owing to the absence of a good quarrying stone, but more largely to the scarcity of skilled stone cutters and masons.

There will be about 240 steel bridges and viaducts, or a total length of 11 miles, and aggregating 61,000 tons. Of this amount, 52,000 tons have been erected or are under construction, leaving about 9,000 tons to be let. The greater part of this will be erected in 1912 and the balance in 1913. The maximum single span is 300 ft., and the Winnipeg River bridge, is an example of these 300 ft. truss spans. Steel viaducts are built with 40 ft. towers and 60 ft. intermediate spans. The viaduct over the Mistongo River (Abitibi region), is typical of these structures. All bridges are designed according to Dominion government specifications; engine loading, class "heavy," weight 180 tons, 49,400 lb. on each pair of drivers. Plate girder spans, both through and deck, are used up to a length of 100 ft. Bridge lettings are generally given early in the year and cover the required erection for the same year, depending on the concrete being completed and track reaching the bridge site. Upon these conditions the time of completion depends. For transportation, construction rates are given bridge companies over lines under construction, on a ton-mile basis. Bridge companies are furnished with drawings and weights of steel, so all can bid under the same conditions. All steel contracts are for a pound price erected, and a unit price for timber in floor.

TRACK AND TRACKLAYING.

The track is laid with 80 lb. rails of Am. Soc. C.E. section, 33 ft. long, with four bolt angle-bar joints. There are 3,000 ties per mile, 18 ties per rail on tangents and 20 on curves. By far the greater part of the ties cut for the line are of jack-pine; tamarack, hemlock, cedar and spruce are used in lesser quantities. Both single and double boom "pioneer cars" were used in tracklaying work. Tracklaying was sometimes carried on throughout the winter, the snow being in some cases shovelled or ploughed off the grade, or simply tramped down sufficiently not to impede the "tie-buckers." Finally snow packed about the ties was found to make a much firmer and more even skeleton track than that laid in the summer, but when this melted, a lot of repairing and shimming was required to render the line safe for material and surfacing trains.

Throughout Jan., 1912, tracklaying was continued west of the Nagagami River at the rate of one-third mile per day, with the thermometer often 40° below zero, and seldom above 5° below. Under favorable conditions, two miles of track a day was often laid for short periods, but temporary interruptions usually brought the average down below one mile a day.

TELEGRAPH.

The telegraph line is being built at the same time as the railway. It provides for an ultimate capacity of 12 wires, although only two wires are now being erected.

PROGRESS AND DELAYS.

It was hoped the entire railway would be completed in six years. Progress, however, on that portion to which access could be had only from either end, was continually interrupted by delay in getting out some large cut, failure of a temporary structure, development of sink holes, or other unforeseen cause. Throughout part of northern Ontario and Quebec, no supplies could be moved except in winter, by reason of the extensive prevalence of clay and muskegs, over which horses could not travel. In other localities, such as those served by Lakes Nipigon, Sturgeon and, to a less extent, Abitibi, contractors were dependent for transport on the season of open navigation. Frequently it was essential to have supplies conveyed part way by steamer and part by winter road.

Failure to foresee and make provision for what should be required months, or even a year ahead, meant serious loss. Uncertainty regarding the duration of the seasons had to be allowed for also. In 1907 there was a 2 ft. depth of snow in the Kenogami district on June 1, and the ice in Lake Nipigon did not break up until June 16; whereas on another occasion snow had disappeared from long stretches of the tote roads (running east from Cochrane and Matheson) before the end of March. Navigation could not generally be relied on after about Oct. 20 on many of the waterways traversed. Toward the close of one of the busiest seasons on Lake Nipigon, both steamboats operating on this route went aground within a fortnight of each other, in consequence of which large quantities of essential supplies were not delivered until late in the winter. During the excessively dry summers of 1909 and 1910, disastrous forest fires swept over the country. These did enormous damage along the line north of the height of land, burning up contractors' camps, warehouses and plant, and putting a stop to the work in many localities.

Scarcity of labor, and time lost in replacing men who quit, was an ever present cause of delay. By far the greater part of the grading was sublet to "station men," who frequently "jumped" if they found themselves going behind with their work. Prices, however, were high, and in most cases, covered the extra cost of pushing the work in the face of unfavorable conditions.

The undertaking has now progressed to such a point that it is reasonably certain trains will be running across the whole eastern division sometime in 1914. The track is already laid 355 miles eastward from Winnipeg and 750 miles westward from Moncton, except for a short distance in southern Quebec, and the yet unbridged St. Lawrence.

Another stretch of track extends east and west of Cochrane, covering 330 miles of the clay belt. This leaves a gap of 150 miles in northern Quebec and another of 240 miles in northern Ontario. Across the former, contractors were putting in supplies last winter, but except for the most easterly 10 miles, which is partly constructed, no grading has yet been done. Throughout the latter, however, only a small amount of excavation and some temporary trestles remain to be completed, on which work is being rushed, so as not to delay the "pioneers" of the tracklaying gangs working from either end. These are expected to meet not later than the end of the present year, giving through connection by way of the T. & N. O. Ry. between the cities of eastern Canada and the wheat fields of the West.

Across New Brunswick, east and west of Quebec city, for about 100 miles out of Cochrane, and between Winnipeg and Superior Junction, train filling, surfacing and ballasting are finished steel bridges are in place; water tanks, stations and section houses built, or under construction; telegraph line strung, and the line practically ready for operation. Division yards are located at an average of 120 miles apart, and the grading and the work on engine houses and other necessary structures for these are well advanced, at all except three of the yards. Sidings are provided about seven miles apart, with a water tank at every third siding.

While the whole country west of the settled part of Quebec was a wilderness six years ago, thriving towns have since grown up at La Tuque, Cochrane, Hearst and Graham. All of these are actual or prospective junction points with other railways and all in the midst of vast pulp-producing forests. La Tuque has the enormous undeveloped water powers of the St. Maurice River behind it, and Cochrane and Hearst are destined to be the market towns for the future farms of the clay belt.

PROGRESS REPORTS ON CONSTRUCTION.

In order to keep check on the rate of progress of the work D. MacPherson, the Assistant to the Chairman introduced percentage forms of reports, being modifications and extensions of somewhat similar forms in use on the C.P.R. The form shown in fig. 3 is returned monthly to the Assistant to the Chairman by the division engineers, through the district engineers, and it is then graphically plotted on a diagram, a portion of which is shown in fig. 4. This shows not only the percentage done during the month on grading, ballasting, and all other items of construction, but also shows the percentage done to date under each of these headings and the percentage done of the whole work in each main contract. This form of report has been found invaluable as an aid in answering requests for information from the government and for compiling the annual reports.

THE COMMISSIONERS OF THE TRANSCONTINENTAL RAILWAY.

Contract No..... District..... Contractor.....

Percentage Report of Work Done, Month Ending ....., 191....

Division No..... from Mile..... to Mile.....

Class of work.	Percentage done in month.	Percentage done to date.	Cost of work done during month	Cost of work done to date.	Approximate estimate of total cost of work.	Brief description of work done.
Grading						
Tracklaying						

Fig. 3. Headings of Monthly Progress Report.

The form of progress report on construction is a sheet 14 in. wide and 17 in. high, divided into seven vertical columns, with headings as follows: 1, class of work; 2, percentage done in month; 3, percentage done to date; 4, cost of work done during month; 5, cost of work done to date; 6, approximate estimate of total

cost of work; 7, brief description of work done. The itemized classes of work in the first column are as follows: 1, grading; 2, tracklaying; 3, ballasting; 4, trestles, culverts and small waterways; 5, permanent bridge substructures; 6, tunnels; 7, fencing; 8, water service; 9, telegraph line; 10, sundry; 11, important individual pieces of work included in the above items, but for which detail percentages are desirable; 12, engine houses, 13, buildings, (stations, section houses, tool houses, trainmen's houses, freight sheds, store houses, ice houses, coaling plants, cinder hoists); 14, advances and deductions; 15, extra work orders.

The percentages are of the total amount of work done on the division (including individual works shown in detail, if any), and they represent the percentage of money value of work done. For tracklaying, ballasting, fencing and telegraph line, the percentage columns must be filled in on this basis, and also the total number of miles completed must be given in the last column (brief description).

The engineering organization consists of a Chief Engineer, G. Grant; assistant Chief Engineer; Bridge Engineer, R. F. Uniacke; district engineers (each in charge of a district 250 to 400 miles long) division engineers (in charge of 40 to 50 miles), resident engineers (in charge of 10 to 15 miles). The Chairman of the National Transcontinental Railway Commission is R. W. Leonard.

FREIGHT TRANSPORTATION FACILITIES AND ADVANTAGES.

The originally estimated distance of 1,900 miles between Moncton and Winnipeg has been reduced gradually by repeated revisions of location at various points to a distance of 1,804.8 miles. This distance is 261 miles less than the shortest distance over any other combined railways between Moncton and Winnipeg. The distance between Winnipeg and Quebec will be 1,351 miles, which is 223 miles shorter than the C.P.R., and the grades are so much more favorable that engines of equal capacity should haul nearly twice the load on the new line that they can on the latter.

Mr. MacPherson points out that transportation of grain by water has always been much cheaper than by rail, but the latter has been slowly and surely cheapening until the present time, when the easy gradients and tremendously powerful locomotives of modern lines will make a combination on land difficult to excel (or peradventure to equal) on water. The distance from Winnipeg to Quebec via C.P.R. to Fort William, and lake, canal and St. Lawrence River to Quebec is 1,771 miles, involving five transhipments of wheat. The distance on the National Transcontinental Ry. will be 1,351 miles, and, as the maximum eastbound grade is 0.04%, compensated for curvature, a Mallet articulated compound is capable of hauling, on this grade, a gross load behind the tender of 4,290 tons. Assuming the tare 33½% of gross load, the net paying load would be 2,860 tons, equal to 95,333 bush. of wheat, in one train. Assuming the earnings of such trains to be $4.40 a train mile, or exactly double the earnings of the C.P.R. freight train miles for 1908, the cost per bushel over the 1,351 miles between Winnipeg and Quebec is bound to be 4.25c. The lowest rate that has been in force from Fort William to Montreal, via the lake, canal and St. Lawrence River, a distance of 1,216 miles, is believed to have been 4c. per bush. in 1908. This rate for 1,216 miles would be equivalent to 4.44c. for 1,351 miles, so that, at $4.40 per train mile, the engines above referred to could haul grain on the National Transcontinental Ry. eastbound from Winnipeg to Quebec for 0.19c. per bush. cheaper than the cheapest existing water route could haul it the same distance, and 10.86c. per bush cheaper than the present combined rail and water rates between the two points in question; in brief, at about 25% of the present rail and water rate. It would appear, therefore, that the days of the absolute supremacy of water transportation are in danger of at least a partial eclipse.

The foregoing, reproduced from Engineering News, was compiled mainly from information furnished by D. MacPherson, M. Can. Soc. C.E., Assistant to the Chairman N.T.R. Commission, which included a detailed statement, prepared at Mr. MacPherson's instance, by Karl Weatherbee, one of the assistant district engineers.

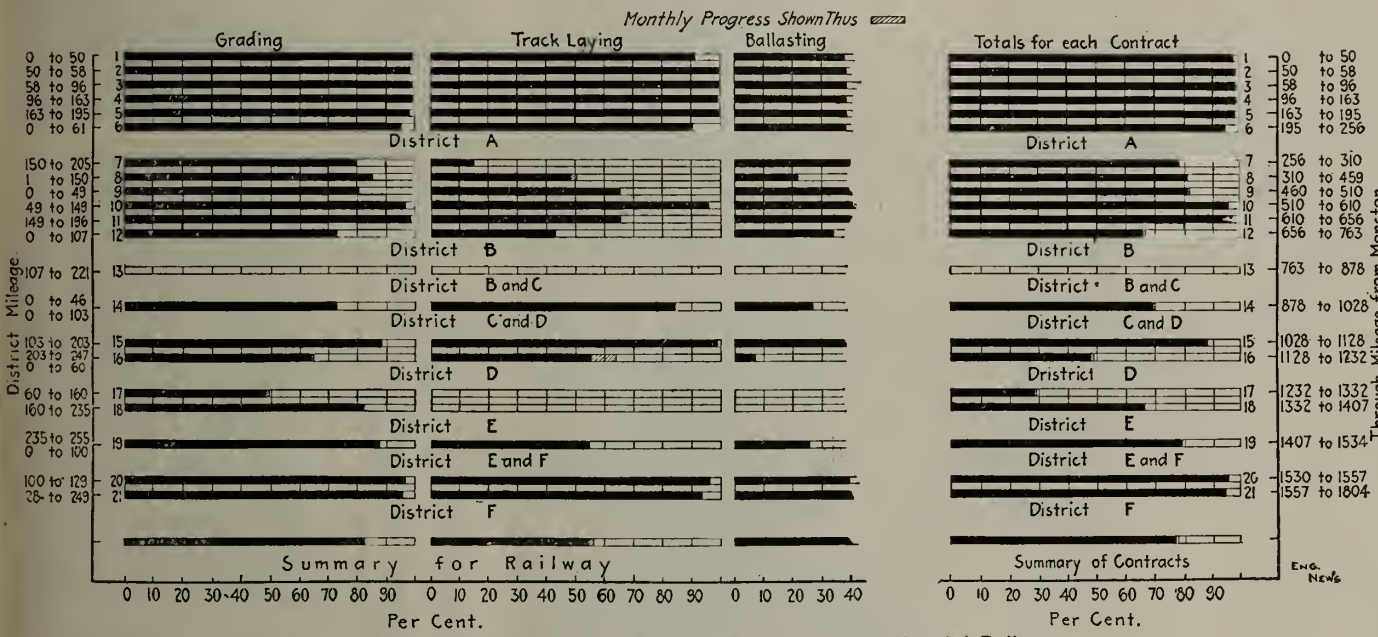


Fig. 4. Portion of Progress Diagram, National Transcontinental Railway.

(The cut shows only the first three and the last of the several classes of work on the entire diagram.)

The National Association of Railway Agents, which will assemble at Chicago, Ill., Sept. 7, to undertake a three weeks' trip to the Pacific coast, will proceed over the Minneapolis, St. Paul and Sault Ste. Marie Ry., to Duluth, Minn., and thence to Winnipeg, from which point they will go to Vancouver over the C.P.R., returning by boat to Seattle, Wash., and thence to Chicago, where they will disperse.

Cape Breton Coal, Iron and Railway Company, Ltd.

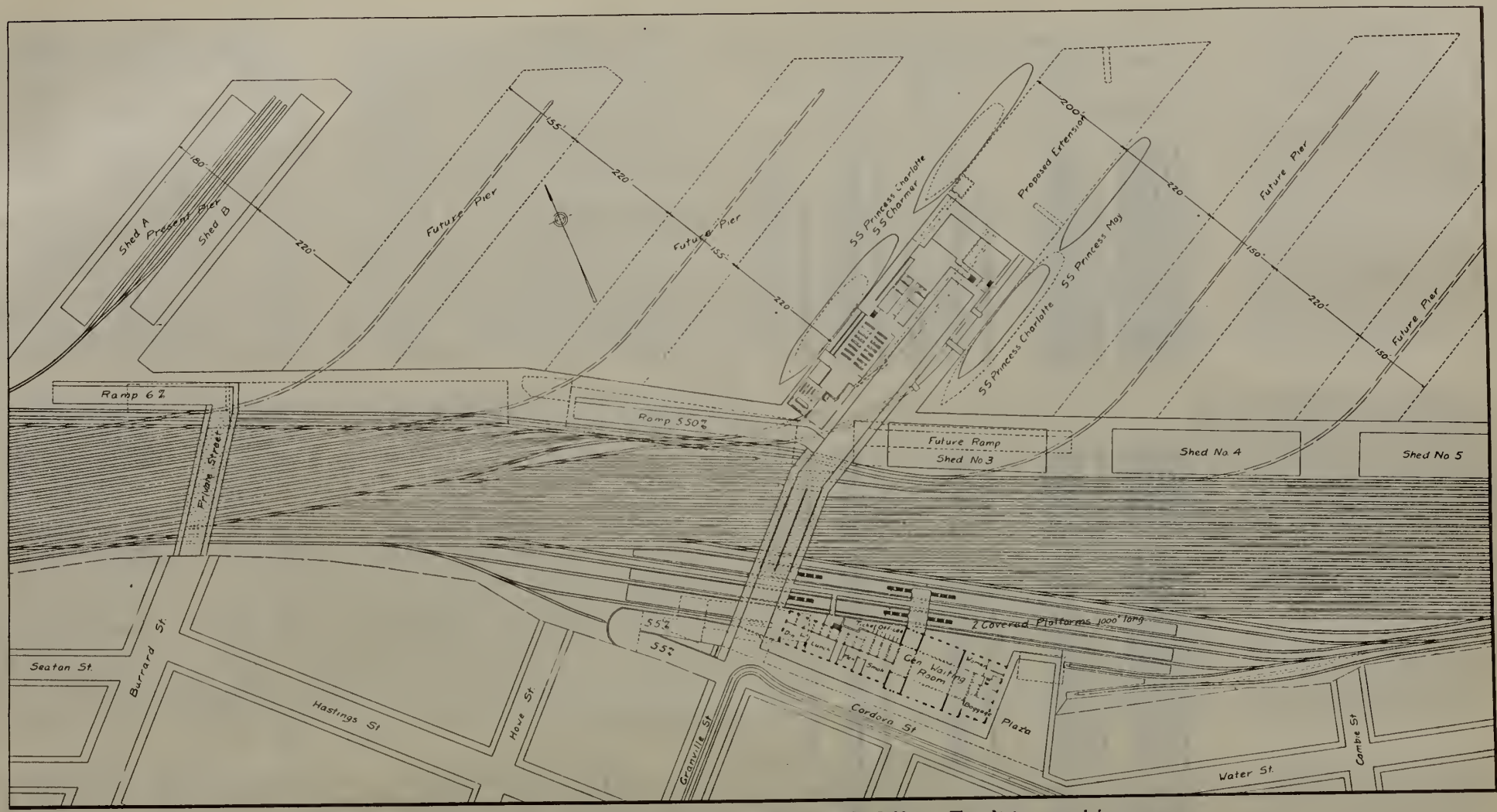
This company offered recently for subscription in London, Eng., £300,000 sterling 6% first mortgage gold bonds at £98 per £100 bond with a bonus of one share of $100 for each bond. The prospectus shows that the authorized bond issue is as follows:— 6% 1st mortgage gold bonds, £410,900; 5% income bonds (of which $921,000 are issued) $2,000,000. The capital is $5,000,000, of which 40,000 shares of $100 each are issued, or agreed to be issued, as fully paid.

The company was incorporated in Nova Scotia in 1895, to acquire and work coal areas in Cape Breton, and has acquired about 50,000 acres in the vicinity of Mira, Cow, and Glace Bays. Development work was started in 1904, and it is stated that the colliery has been developed and equipped to produce 500 tons a day, which output can be handled as soon as a railway to Mira Bay and shipping facilities there are complete. The company in 1905 built a short piece of railway from the colliery at Broughton to the Sydney and Louisburg Ry. and the President, H. Mayhew, states that the extension, with wharves, and other facilities for handling the coal at Mira Bay can be completed within six months and will not cost over $400,000, which includes about $120,000 for rolling stock.

Four of the directors, H. Mayhew, W. B. Gladstone, A. H. Ramsden-Tagore and C. T. Richardson, reside in England, the other director is Wm. Hanson, of Montreal.

The Reduction of Smoke by the use of underfeed mechanical stokers has been effectively accomplished on freight locomotives on the Vandalia Railroad, in recent months, according to W. C. Arp, Superintendent of Motive Power of that line. They are said to dissipate smoke promptly while the locomotive is working, and when combined with instructions to the crew are found to produce good results. This company finds that a knowledge of the various coals used and consideration of the conditions under which they are burned are aids in the reduction of smoke.

George Stephen, General Freight Agent, Canadian Northern Ry., Winnipeg, Man., writes: "I find Canadian Railway and Marine World very interesting and instructive and wish it continued success."



Canadian Pacific Railway Passenger Terminal and Office Facilities at Vancouver.

The last issue of Canadian Railway and Marine World contained a description of the improvements which have been started on the C.P.R. passenger terminal at Vancouver, B.C. The late date at which the official information reached this office rendered it impossible to have an engraving made in time for that issue so that the description alone could be published. The plan is given on this page and so that it may be thoroughly understood a portion of the description is repeated below:—

The present passenger station, which is located at the foot of Granville St., near the shore line of Burrard Inlet, was built about 14 years ago, and except for minor alterations, is unchanged from its original plan. The general waiting room and ticket offices are at the street level, and the baggage room is on the track level, which is about 30 feet below the street.

Along the water front across the local freight yard tracks are located the steamship wharves. There are two large sheds on a jetty pier of recent construction used by the C.P.R. trans Pacific steamship lines; also five sheds adjoining the longitudinal wharves used by the C.P.R. Victoria, Seattle, Alaska and other steamship lines. Between the wharf sheds and the passenger tracks adjoining the passenger station certain of the freight tracks serve the several sheds, and other tracks are usd for drilling and storage. The yard tracks extend along the harbor front about a mile and a half.

The growth of Vancouver has rendered inadequate the present facilities for handling the C.P.R.'s terminal business and the general plan adopted has been designed to relieve the present congestion, as well as to provide for reasonable growth in the near future.

The general scheme embraces a passenger station and office building located on available land immediately east of the present passenger station. There will be four passenger tracks, with provision for more when required, separated by wide platforms, between the station and the present freight yard. The passenger tracks are to be raised about 5 ft. above the present track level to reduce the difference in level between the street and the tracks to about 25 ft.

In order to avoid an inconvenient grade crossing and delays to traffic between the city and steamship wharf a bridge on the line of Granville St. extended, is to pass over the passenger and freight tracks to the steamship pier and

connect directly with passenger accommodations on the pier. An incline is also to be built leading from the west side of this bridge to the wharf, giving access to the lower deck of the pier and freight sheds and the water front. Another viaduct over the tracks is to be built on the line of Burrard St. extended northerly, with an incline giving access to the present trans Pacific pier and other portions of the water front.

The main entrance of the passenger station will be on Cordova St. with the main waiting room located centrally in the station on the street level. Ticket offices serving the several classes of railway and steamship passengers will be located at one end of the waiting room. and the baggage checking room. luncheon and dining room, parcel room. women's waiting room, men's smoking room, news booth, information booth and other facilities will be all placed immediately adjoining the main waiting room.

On the lower floors of the station will be the baggage rooms, express company's space, immigrants' rooms, supply rooms, and other station facilities not directly used by passengers. Stairways and lifts will connect the two levels of the station and also afford communication with the office floor above. A separate foot bridge will be carried over the passenger tracks directly connected with the waiting room at one end and with stairways leading to the track level giving access to platforms without crossing tracks at grade. The track platforms will be 1,000 ft. long, and will be covered with shelter sheds of the umbrella type. The platform adjointing the station will be used only for baggage express and supplies.

Above the public rooms of the station building the space will be devoted to the company's offices. The interior arrangement of the office space will be adapted for a unit system of sub-division; that is, each panel will have heating and lighting facilities so that partitions may be placed or removed at will in order to provide for changes in arrangement of office accommodations which may be desired from time to time.

The proposed steamship station on the pier will be a two level building, the upper floor being devoted to the passenger business and offices and the lower floor to freight, baggage and express. There will be double level gangways on the west side of the pier, which will be used for the Victoria and Seattle service, the lower gangway being used for freight and the upper for passengers; these gangways to be supported on floating pontoons to maintain the landing at a constant level with respect to the boats. On the passenger or upper level of the pier will be waiting rooms, ticket offices, baggage checking room, customs office and other conveniences. Separate rooms will be provided for outgoing and incoming passengers. Two tracks will be placed on the surface of the pier within the shed, and one track on the outside of the building for the direct handling of freight between cars and steamers.

The essence of the general design has been to secure easy lines of communication between the railway trains, steamers and the city. The traffic conditions at Vancouver are unusual as compared with other large terminals on account of the absence of suburban business. The aggregate number of trains is not large, but they are long and frequently are run in several sections and contain a number of classes of traffic.

The designs for the terminal have been prepared by Westinghouse, Church, Kerr and Co., in co-operation with C.P.R. officials, and the construction of the station and facilities is being carried out by the same organization.

Improved Design of Numbers for Headlights, Etc., on the C.P.R.

Owing to the rapidity with which numbers on locomotive headlights, locomotives, cars, etc., have to be read, and with all kinds of varying lights, it is of the utmost importance, and essential to safety, that they should be as plain as possible, and that all similarities should be got rid of. It is a well known fact

Ibsen 7.2		f	9 58	16 40	20.03
Lang 8.0	FN	s	9 43	s 16.25	19 49
Milestone 6.3	WMI	s	9 25	s 16 08	19.33
Corinne..... 5.3	NI	f	9 13	f 15.55	19.20
Wilcox..... 5.1	CO	s	9 01	s 15 44	19 10
Diana 5.4			8 50	15 33	19 00
Rouleau ..W 6.5	OA	s	8.38	s 15 22	18.50
Pitman.....	..	f	8.25	15.08	18.37

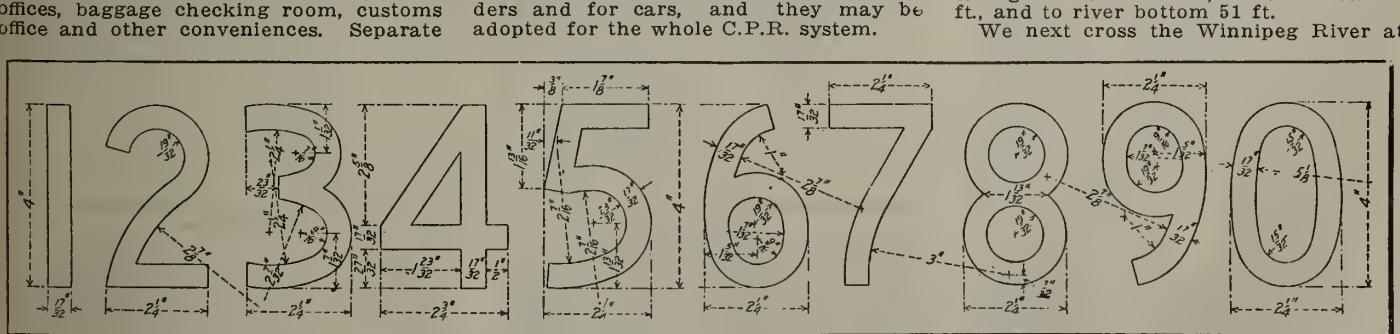
Section of Working Time Table, C.P.R. Western Lines.

that the usual figures 3, 6 and 8 are not very distinctive and that they may be easily mistaken for one another.

With a view to remedying this, George Bury, Vice President and General Manager, Western Lines, C.P.R., has designed a series of letters which are certainly a great improvement on the ordinary ones and which it would be very difficult to mistake, as they appear to remove all possibility of error, the long loops in the 3's and 6's having been got rid of, while the difference between 5 and 6 has been made more marked.

The accompanying drawing shows the letters Mr. Bury has designed, which are being used on locomotive headlights and in working time tables on the Western Lines. A facsimile is also given of a section of a working time table, so that the figures may be compared with the ordinary ones.

It is probable that the new figures will also be used for locomotive cabs and tenders and for cars, and they may be adopted for the whole C.P.R. system.



Locomotive Headlight Numbers used on C.P.R. Western Lines.

The Huntsville, Lake of Bays and Lake Simcoe Navigation Co. is having an engine for one of its vessels compounded at the Polson Iron Works, Toronto.

The Dominion Government s.s. La Canadienne, which broke through the lock gates of the Welland canal at Port Colborne, June 20, was docked at Port Dalhousie for the repairing of two holes which were punched in her hull.

Steel Bridges on the Grand Trunk Pacific Railway.

By J. G. Le Grand, Bridge Engineer, G.T.P.R.

Our bridges are designed in accordance with the specifications of the Department of Railways and Canals, to carry a live load to correspond to class "heavy" of the said specifications, viz., a moving load composed of two 180 ton compound engines followed by a train estimated at 4,750 lbs. per lineal foot of track.

The story of a bridge can be summarized as follows:—Study of the crossing at site by the field engineers, who prepare a cross-section plan, also contour map showing the shape of the ground, kind of foundation, high and low water, velocities of stream, etc. When this information reaches the bridge department one or more general diagrams are prepared and stress diagrams of the different parts of the structure are studied. From these stress diagrams estimated weights are made and the cost of the whole crossing is computed; then comes the designing of the different parts of the substructure and superstructure. Bids are then called for, and when contracts are let complete sets of designs, both of substructure and superstructure, are sent to the bridge company, and set of substructure drawings sent to the field—then everything is supposed to go smoothly.

I will take in order a few of the bridges, beginning at Fort William, on our Lake Superior branch, then along the main line to Winnipeg, and west of Winnipeg as far as they have been built, followed by those on our branch lines.

At Fort William we have a bridge over the Kaministikwia River, 394 ft. 3 in. between parapet walls, composed of one 258 ft. swing span and one 125 ft. through truss span. This bridge has been designed to carry a single railway track and one roadway on each side, supported on brackets, each roadway capable of carrying an electric track. The distance from base of rail to water line is 33 ft., to the bottom of river 56 ft., and to rock line 95 ft. The principal feature of this bridge is that the centre pier has been carried down to rock line through a steel cofferdam 38 ft. in diameter and 63 ft. deep. This, I understand, sets a record for foundation made through open cofferdam under water. The pier between the swing span and the fixed span is composed of two twin cylinders 15 ft. in diameter, resting on two steel cofferdams 18 ft. in diameter, filled with concrete, and 65 ft. deep.

The next steel bridge on the Lake Superior branch, at the crossing of the Dog River, is 254 ft. long, composed of two 125 ft. deck spans and temporary wooden trestle on each end. Base of rail to high water is 39 ft., to low water 45 ft., and to river bottom 51 ft.

We next cross the Winnipeg River at Minaki with a bridge about 410 ft. long, composed of one 300 ft. through span and one 100 ft. deck girder span. Base of rail to high water is 29 ft., to low water 33 ft., to river bottom 79 ft., which means about 50 ft. of water at high water.

Next we have a bridge over the Assiniboine River at Winnipeg, 468 ft. 8 in. between parapet walls, composed of one

44 ft. through girder span, four 80 ft. deck spans, and one 90 ft. lift span trunnion type. This bridge is designed for a double track. Base of rail to high water 15 ft., to low water 43 ft., to bottom of river 56 ft., and to rock 63 ft.

Our first steel bridge west of Winnipeg, on the main line, at mile 45, over the Assiniboine River, is 437 ft. 2 in. inside of parapet walls, composed of one 250 ft. through truss span and one 88 ft. through plate girder span at each end. Base of rail to high water 13 ft., to low water 22 ft., and to river bottom 34 ft.

We also cross the Assiniboine River at mile 203. This crossing is 255 ft. inside of parapet walls, and is composed of one 250 ft. through truss span. Base of rail to high water 8 ft., to low water 20 ft., to river bottom 30 ft.

Grand Trunk Pacific Ry. Bridge over McLeod River, 914 miles West of Winnipeg.

At mile 468 we cross the South Saskatchewan River near Saskatoon with a bridge of 1,501 ft. inside of parapet walls, composed of one 175 ft. through truss span, five 225 ft. deck truss spans, one 125 ft. deck truss span, and one 50 ft. deck span. Base of rail to high water 52 ft., to low water 71 ft., to river bottom 75 ft.

At mile 675 we cross the big Battle River valley with a steel viaduct of 2,772 ft., and wooden trestle of 2,600 ft. The steel structure is composed of fifty-one 50 ft. deck spans, one 70 ft. deck span, and one 150 ft. deck truss span, resting on 26 steel towers and two abutments. Base of rail to high water 157 ft., to low water 184 ft., to bottom of river 190 ft.

At mile 786 we cross the North Saskatchewan River at Clover Bar, about nine miles east of Edmonton, on a bridge 1.655 ft. 5 in. inside of parapet walls, composed of two 50 ft. end deck spans, eight 50 ft. and four 40 ft. intermediate spans resting on seven piers, three 225 ft. deck truss spans resting on piers, and two 150 ft. deck spans resting on piers and tower. Base of rail to high water 106 ft., to low water 137 ft., to bottom of river 143 ft. The principal feature of this crossing is the four concrete river piers, which have an average height from the bottom of foundation to the top, of 120 ft.

At mile 861 we cross the Pembina River on a bridge of 902 ft. 2 in. between parapet walls, composed of two 60 ft. end deck spans, two 210 ft. and one 240 ft. deck truss spans, and two 60 ft. tower spans, all resting on two towers and masonry. Base of rail to high water 187 ft., to low water 208 ft., to bottom of river 224 ft.

At mile 914 we cross the Wolf Creek with a bridge 652 ft 2 in. between parapet walls, composed of two 60 ft. end deck spans, two 40 ft. tower spans, and three 150 ft. deck truss spans, resting on two steel towers and masonry. Base of rail to high water 116 ft., to low water 125 ft., to bottom of river 130 ft.

On the same mile we cross the Mcleod River with a bridge of 1,066 ft. 11 in. between parapet walls, composed of two 70 ft. end deck spans, four 210 ft. deck truss spans, two 40 ft. tower spans resting on two steel towers, one river span 80 ft. high and abutments. Base of rail to high water 107 ft., to low water 118 ft., to bottom of river about 122 ft.

At mile 980 we cross the valley of Prairie Creek with a bridge 802 ft. 2 in. between parapet walls, composed of two 70 ft. end deck spans, three 70 ft. and nine 50 ft. intermediate deck spans resting on six towers, one bent and two abutments. Base of rail to high water 93 ft., to low water 94 ft., to bottom of river 98 ft.

At mile 1,014 we cross the Athabasca River with a bridge of 668 ft 8 in. between parapet walls, composed of three 225 ft. through truss spans. Base of rail to high water 13 ft., to low water 16 ft., to bottom of river 33 ft.

At mile 1,016 we cross the Snaring river with a bridge of 459 ft. 2 in. between parapet walls, composed of two 225 ft. through truss spans. Base of rail to high water 8 ft., to low water 14 ft., to bottom of river 18 ft.

On the Tofield-Calgary branch at mile 84 we cross the Red Deer River valley with a steel bridge of 770 ft. and two approaches of temporary trestle, making a total length of 1,493 ft. The steel part is composed of four 50 ft. deck spans, two 180 ft. and one 210 ft. deck truss spans, resting on four steel towers. Base of rail to high water 96 ft., to low water 111 ft., to bottom of river 117 ft.

On the Alberta coal branch, which starts from Bickerdike, mile 932 west of Winnipeg, we cross the McLeod River at mile 6 with a bridge of 304 ft. of steel, with timber approach at each end. The steel part is composed of two 150-ft. deck truss spans, resting on masonry. Base of rail to high water 49 ft., to low water 62 ft., to river bottom 65 ft.

On the same branch we cross the Embarrass River at mile 22 with an 80-ft. deck girder. Base of rail to high water 22 ft., to low water 28 ft., to bottom of river 30 ft. We also cross the same river at miles 24.5 and 35.5 with similar spans. At mile 34 we again cross this river with a 66-ft, through plate girder span. Base of rail to high water 8 ft., to low water 13 ft., to bottom of river 15 ft.

On our main line from Prince Rupert east we have one bridge crossing the Zanardi Rapids at mile 8, 658 ft. 4 in. between parapet walls, composed of three 55-ft through plate girder spans, two 125-ft. and one 225-ft. through truss spans. Base of rail to high water which is the highest tide, 7 ft. 6 in.; to low water 32 ft. 6 in., to bottom of river 43 ft. 6 in.

Outside of the above bridges, which are now complete, we have under construction or study about 40 more, one of the most important, now actually under construction, being at mile 164, Prince Rupert east, over the Skeena River.

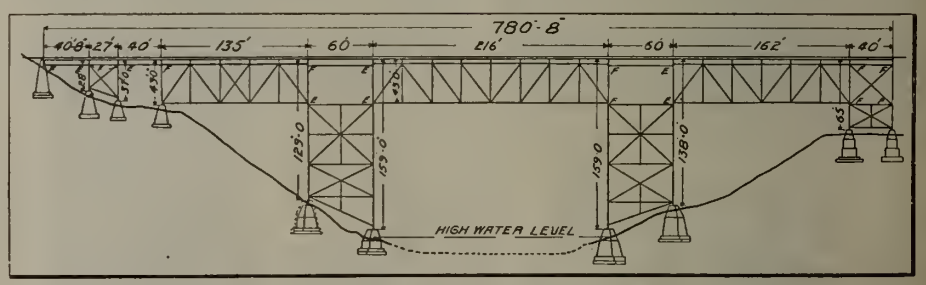
The foregoing paper was read before the Western Canada Railway Club recently.

The Canadian Northern Railway Bridge Over the Pembina River, Alta.

The route selected for the extension of the C.N.R. westward from Edmonton, Alta., towards the Yellowhead Pass, involves the construction of a couple of rather heavy bridges over the Pembina and McLeod Rivers, as these streams have eroded their channels far below the general level of the country. At the Pembina River the banks rise steeply from the water's edge without the usual river flats intervening between the channel and the terraced benches so often seen in deep river valleys; the absence of river flats at the Pembina River thus reducing the length necessary to be bridged.

The total length of steel work is 780 ft. 8 ins., the approach at the east end being 28 bents of the C.N.R. standard framed timber trestle 68 ft. in height. The river span is 216 ft. long, supported on steel towers on concrete pedestals, the span of these towers being 60 ft. The east and west flanking spans are respectively 162 and 135 ft. long, and the western approach is of viaduct construction.

The three truss spans are of the Pratt type, with rivetted connections, the panel spacing being uniformly 27 ft., the trusses are spaced 17½ ft., c. to c., and the depth of trusses is 36 ft. from centre to centre of chords. The floor beams rest on the top of the upper chord with bracket connections to chord at ends of floor beams.



Canadian Northern Railway Bridge over Pembina River.

The towers are designed to take care of all lateral and longitudinal stresses, and sufficient anchorage is provided to overcome any possible uplift. The live load for which the structure is designed is Class 1 of the Dominion Government specifications.

We are indebted to W. L. Mackenzie, Bridge Engineer, for the foregoing information.

The Timagami Steamboat and Hotel Co.'s hotel Lady Evelyn was burnt, July 4. The loss, which is estimated at $30,000, is partly covered by insurance.

The Rebuilding of the C.P.R. Bridge Over the St. Lawrence River at Lachine.

An illustrated article on the rebuilding of the C.P.R. bridge over the St. Lawrence, at Lachine, Que., prepared by a member of Canadian Railway and Marine World's staff, who visited the work, was published in the February issue. The following information has been supplied officially recently:—

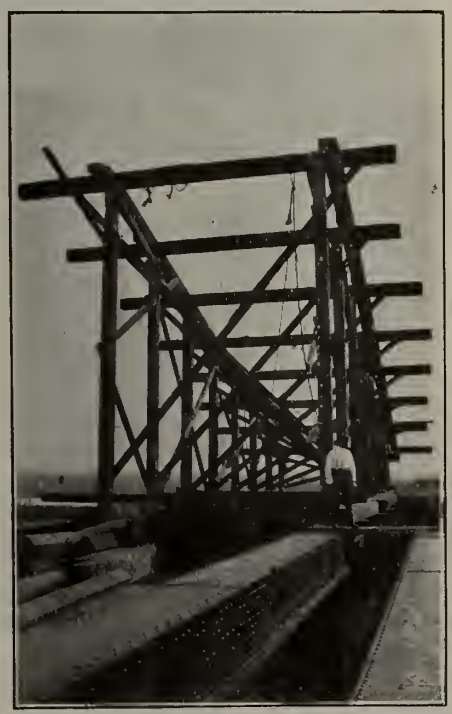
It was early in 1910 that the management came to the conclusion that the time had arrived to rebuild the bridge, so as to provide for a second track to handle the enormous increase in traffic over this important approach to Montreal from New York and other U.S. points, and contracts were let.

On July 12, 1910, the first operation was made on the enlargement of the old piers to carry the new girders before any of the new steel could be swung. This in itself was a huge job, and the contractors undertook to complete the first 11 piers during the first season. This was not accomplished, but the 11 piers were completed to a point above the water and all the work on them was completed by Nov. 8, 1911, leaving only pier 13 on the up-stream side to be finished when the cantilever is taken out, but this will not be started probably until next year, as until the last two stages are completed, which is part of the work now under way, this cannot be done, owing to the cantilever tracks of the bridge being in use.

The work on the superstructure was commenced March 15, 1911, when the placing of the two 80 ft. deck plates was undertaken, and ever since the work has been hurried forward with all speed. The bridge, when completed, will contain steel spans as follows: Six 80 ft. long, sixteen 120 ft., four 270 ft., two 122 ft., eight 240 ft, four 270, and four 480 ft, making the total length of the bridge in spans, 3,138 ft. The bridge was cut down, so to speak, from four 240's to eight 120's as far as pier seven. The piers on which the girders are resting consist of open casement to pier seven, counting from the island side, and from eight to 15 inclusive, the pneumatic casing was used. Eleven spans were erected from the main line, on the down stream track, out to pier seven, and then a cross over enabled the traffic to reach the new steel and the work of bridging was continued without the traffic being in the slightest degree interrupted, beyond that caution was used by trains in crossing the bridge, every train travelling at slow speed.

The changing or reducing of the spans to smaller ones, and the device used for putting them into place, resulted in the saving of thousands of dollars. The introduction of the smaller spans has no tendency to reduce the strength of the bridge, but on the other hand, it greatly increases it, as the weight is being carried by more spans on shorter lengths. During the carrying out of the work, only two cross-overs were necessary to complete it to the eleventh pier, from which point the huge channel spans, which are 480 ft. long, commence. The placing of the spans has reached such a point that no further cross-overs will be required, and the traffic will cross on the steel on the west side of the bridge until the east is totally completed, which it is expected will be by next autumn, provided everything goes on satisfactorily. The whole of the bridge as far as the eleventh pier, or the swinging of the huge channel spans are concerned, is finished, with the exception of a small length of new steel to replace the old, and the progress has been well maintained throughout with a gang of nearly 100 men.

Work has now commenced in connection with the placing of the two 408 ft. spans, which will fully complete the west side of the bridge. The spans are being erected at the Dominion Bridge Co.'s yards, which are in close proximity to the bridge connected by a spur line. As soon as this is finished, the spans will be re-erected on the finished deck-plate portion of the bridge on the Caughnawaga side of the river, where space sufficient in length has been left for the purpose. This done, one end will be attached to a huge derrick which has been specialy erected for the purpose of steadying and assisting in putting the end into place, while the other end will be floated on a huge scow in the river below, and in this way the spans will be floated into position. It is expected that the work which has to be done before the bridge is finally completed for second track service, will occupy at least another twelve months. The work of floating in the four huge spans will occupy almost as much time as the rest of the bridge work has done. These through channel spans are not of the cantilever type, but the strength of the bridge will be below, and when the work is nished, the bridge will constitute one of the finest pieces of engineering work on this continent. The two flanking spans on the south side are practically completed, so that everything is in readiness for going ahead with the work, and this will be done within the next week or two, as soon as the steel is discharged from the workshop.



Derrick erected to assist the Floating in of the 408 ft. spans, C.P.R. Lachine Bridge.

It is expected that early in August the second tracking will be completed on both the down stream side and the up stream side to the point where the longest spans are to be put in to replace the present cantilever spans.

In the new bridge there will be 28,072,252 lbs. of steel. The 80 ft. lengths run 110,000 lbs., the 120's 226,000, the 240's 960,000 lbs., the 270's 1,324,138 lbs., and the 408's 2,600,000 lbs. Starting from the island side, the bridge widens out at the seventh pier, from 16 ft.. from centre to centre of trusses, to 20 ft. at the eleventh pier, and continues from that point to the end.

The work being done in the vicinity of the Lachine bridge is of a very extensive character, and not only includes the enlargement or second tracking of the structure across the St. Lawrence, but three other bridges approaching the main bridge, are to be second tracked, while the bridge across the Lachine canal will, in the near future, have to undergo the same enlargement. This is a heavy swing bridge, but the appropriation has not yet been made, and several matters are to be settled before the work can be started. Still, with the complete second tracking of the approach from the Montreal main line to the Lachine bridge, the second tracking of the canal bridge must inevitably follow. New spans have been inserted in the bridge that crosses the G.T.R. at Rockfield, and the filling up of the sidings for the double tracks approaching on either side is being continued. At the Highlands extensive works are also being carried out.

The C.P.R. is carrying out these works at a cost of about $3,000,000, in pursuance of its policy to build a second track over the whole of its main transcontinental line, and it is anticipated that before many years, this will have been completed from St. John, N.B., to Vancouver, B.C. Owing to the great difficulty in securing the requisite number of men in various parts of the country, the company is somewhat handicapped in pushing forward the huge work of double tracking.

First Aid to the Injured on the Canadian Pacific Railway.

By S. A. Gidlow, General Secretary, St. John Ambulance Association, C.P.R.

On first thoughts, the reader may consider the subject either too dry, or something entirely out of his line, therefore, I will commence by stating that if he will have a little patience he will find it not so dry after all, and, no matter what his occupation, it does concern him very materially. One of the first questions usually asked is, "What is First Aid?" and I think the best way to answer this question is to state what its objects are:

To instil into the public mind a few simple, practicable lessons showing how best to render instant attention to persons suffering accident or sudden sickness, pending the arrival of skilled medical assistance.

To teach people what not to do, so that there may be no likelihood of the bystander causing aggravation to injury, or loss of life through improper first aid treatment.

In case of emergency, such as bleeding, accidental poisoning, choking or drowning, a life may not be sacrificed by want of a little intelligent first aid knowledge on the part of the bystander.

To attempt to explain in detail the various kind of accidents in which first aid has been rendered successfully, would be wearisome, therefore a comparative list has been compiled showing the advantage of first aid, and the consequences resulting from the want of such knowledge:

WANT OF FIRST AID KNOWLEDGE.

1. A little child was sitting at the dinner table with the family. With its mouth full of food, it got into a fit of temper over something its brother was having served to him, the food became lodged in the windpipe, and, notwithstanding the slapping of its back, it went black in the face, throwing its arms wildly about; the father rushed out of the house to fetch a doctor, who lived but a short distance away, but on his arrival life was extinct.

VALUE OF FIRST AID KNOWLEDGE.

1. A little child, whilst eating an apple, bit off a piece larger than he intended. By some means this piece slipped down his windpipe, and became lodged. The child became black in the face; the mother rushed to a neighbor who happened to know first aid. Upon her arrival, the child, being found unconscious, she immediately used first aid knowledge as instructed, with the result the doctor stated, the child was none the worse for its accident.

2. A girl playing around the table accidentally pulled the table cloth and upset a pot of hot tea over her chest. One of the company present frantically pulled the child's clothes off, undoubtedly with good intentions, but the result was the skin wae torn off the chest, necessitating her detention for three monthe in the hospital, where her life was despaired of for some time. In after life, when she became a mother, she was unable to suckle her offspring, in consequence of those injuries preventing the proper development of the breast.

2. A little child was sitting in a baby chair in front of the fire, when the mother, going to the fire for some purpose, accidentally caught the handle of a saucepan of boiling water, and tipped it over both feet and legs of the child. A first aid who happened to be present, treated the injuries as instructed. After a few days in bed and a little convalescence, the doctor discharged the child none the worse for its misadventure.

3. Two cyclists were riding along a greasy road, when one had a side slip, throwing him beneath the wheels of a heavy van, which passed over one of his thighs, completely smashing the bone; the broken ends of the bone severing the main artery. His friend sent a messenger to the nearest doctor, about 30 yards away, and stood by hie friend, seeing his life's blood ebbing away. Upon the arrival of the medical man life was pronounced extinct.

3. Father and son were driving in an automobile, and while attempting to make a short turn the back part of the machine struck a telegraph post with great force, pitching both occupants into the roadway. The father sustained a compound fracture — that is, a fracture where the bone has been driven through the skin— in addition to this the main artery was severed. The son, who had a knowledge of first aid, applied the proper treatment, stopped the bleeding, and conveyed him to the hospital, where he was complimented upon saving his father's life.

4. A man with a weakness of the lungs, whilst stooping down broke a blood-vessel, the blood gushed out in great quantities. His colleagues picked him up and carried him to the nearest doctor, but he had not proceeded many yards when he died in their arms.

4. A lady was knocked down by a passing vehicle. The wheel passed over her chest, breaking several ribs, and the broken ends penetrated the lungs. Blood gushed out of her mouth. A first aider, happening to be on the scene, treated her under first aid rules; sent for a doctor, who ordered her removal to hospital by ambulance, where she ultimately recovered.

Let us take another form of comparison to show the value of this knowledge. Some little time back, a man was knocked down by a street car, causing a simple fracture of the thigh bone, that is to say, the bone only was broken, and none of the parts adjacent thereto, such as the tissues or arteries were injured. The bystanders, with the idea of getting the poor fellow out of the way of passing traffic, lifted him to a perpendicular position, with the weight of his body on the broken leg, thereby causing the broken bone to become further displaced, and to pierce the femoral, or main artery of the thigh. As a result of this well meant but ignorant action on the part of the public, the man died from loss of blood before the services of a medical man could be obtained. Had the driver or conductor of the street car in question, been instructed in the principles of first aid, and made use of such knowledge, the poor fellow's life could easily have been saved, and the company they were serving thereby saved heavy claims for damages.

The case of possible deaths from drowning demands special attention. Such may occur from the upsetting of a boat, a careless step by the river side, on the dock or harbor quay. In many of these there may be willing hands to save, but few possess sufficient knowledge to quickly restore animation and consciousness. Ignorant and careless handling of the supposed victim by drowning has often unwittingly completed the work of suffocation by immersion, and one can realize what this means in this country, where an average of 700 drowning accidents occur every year.

First aid is a branch of work entirely different from that of the surgeon. It is special, and differs from the special training which every student receives. The medical student is taught to use all the best and most approved methods, while the first aid student is taught to use whatever is nearest to hand in the most scientific way possible. He must make a bandage out of a necktie or a handkerchief. He must improvise a tourniquet from a belt or brace; for splints he must utilize a stick, a rifle, an umbrella or folded newspapers, and construct a stretcher out of a couple of broomhandles and coats.

The officials of the C.P.R. centre of the St. John Ambulance Association have for some time past realized the value of this movement to their employes and to themselves, as is seen from the fact that they are now organizing first aid classes amongst all classes of employes throughout the railway system, so that no matter where an accident may happen, there you will find an ambulance man able and

P289 S. A. Gidlow,
General Organizing Secretary, St. John Ambulance Association, C.P.R.

willing to render instant attention to persons suffering from accident or sudden sickness. The cost of instruction and the books and first aid material necessary, are furnished by the management free of charge. A lecturer is provided, who gives one lecture a week to the men until the full course of five lectures has been given. The syllabus of instruction is as follows:

FIRST LECTURE.—Preliminary remarks, objects of instruction, etc. A brief description of the human skeleton, bones, joints, and the muscular system. Signs, symptoms and treatment of fractures, dislocations, sprains and strains. The triangular bandage and its application.

SECOND LECTURE.—The heart and blood vessels. The circulation of the blood. The general direction of the main arteries, indicating the points where the circulation may be arrested by digital pressure or by the application of the tourniquet or by other means. The difference between arterial, venous and capillary bleeding, and the various extemporary means of arresting it. The triangular bandage and its application.

THIRD LECTURE.—A brief description of the nervous system. First aid to persons suffering from shock or collapse after injury, injury to the brain, collapse from drink, epilepsy, fainting, hysteria, sunstroke, electric shock, effects of lightning, and convulsions in children. First aid in cases of frost-bite, burns, or scalds, injury by vitriol throwing, wounds, bites of animals, stings of insects. What to do when the dress catches fire. The triangular bandage and its application.

FOURTH LECTURE.—A brief description of the organs and mechanism of respiration. The immediate treatment of the apparently drowned, or otherwise suffocated, artificial respiration; treatment for choking. First aid to those poisoned. The immediate first aid treatment of injuries to the internal organs, and of those suffering from internal hemorrhage. Foreign bodies in the eye, ear and nose.

FIFTH LECTURE, (FOR MALES ONLY).—Improvised method of lifting and carrying the sick or injured. Methods of lifting and carrying the sick or injured on stretchers. The conveyance of such by rail or in vehicles.

FIFTH LECTURE, (FOR FEMALES ONLY).—Preparation for reception of accident cases. Means of lifting and carrying. Preparations of bed. Removing the clothes. Preparations for surgeon.

As soon as ever the lectures are finished, the men are taken in hand by one of the company's ambulance instructors, whose duty it is to teach the practical work, such as the proper application of bandages and splints, to various parts of body and lifting and carrying the injured on stretchers, etc. The reader may not think the placing of a man on a stretcher of much importance, but it is really a very important part of the work, as a great deal of damage may be done in placing a man on a stretcher.

No man is allowed to give instruction in the practical work before he is fully qualified, and before any such man is fully qualified to act as instructor, he must hold the certificate, voucher, and medallion of the St. John Ambulance Association, and these honors can only be obtained after three years constant application to first aid work, during which time he must attend three courses of lectures, and undergo three examinations in first aid, each examination more exacting than the previous one, before he obtains the medallion, or full qualifying badge of the Association. Before the instructor allows his class to go up for examination, the members of the class are expected to answer a series of test questions, and to do the practical work in connection with them. Below are given a few of each grades of questions, which the first aid student is expected to answer:

FIRST TEST.—What is first aid to the injured. What are signs? What are symptoms? What results of injuries must receive the first attention? What steps must be taken beyond the actual treatment of injury? How would you remove clothing when necessary? What must the first aid student not do? What is elementary anatomy? What is elementary physiology? Etc. etc. etc.

SECOND TEST.—What organs are concerned in the circulation of the blood? Trace the circulation of the blood through the organs and lungs. How many kinds of hemorrhage are there? In what way should arterial hemorrhage be controlled? What is a tourniquet? Describe the various main arteries? What is a fracture? State the general signs and symptoms that may be present in cases of fracture. What apparatus may be necessary for the treatment of fracture? How may splints and bandages be improvised? Give the general rules for the treatment of fractures, etc.

THIRD TEST.—State the general treatment for burns and scalds. What steps should be taken when a woman's dress takes fire? State the signs, symptoms and treatment for frost bite. State the

treatment for injuries to joints. How would you remove foreign bodies from the eye, ear and nose? State the treatment for wounds of the abdomen? What is the difference for treatment of injuries to the stomach, and of injuries to the liver, spleen, and intestines? Etc.

C.P.R. men treating a fractured thigh.

Fourth Test.—What are the two symptoms of nerves? Of what is the cerebro-spinal system made up? What is the spinal cord? What are nerves like? Explain the sympathetic system. Explain the respiratory system. What is exciting respiration? What is inducing circulation? State the various forms of insensibility, and their treatment. What are the signs, symptoms and treatment for concussion of the brain? What are the signs, symptoms and treatment for compression of the brain, apoplexy and epilepsy? How would you treat for shock to the system? State the treatment for strangulation, hanging, smothering, or choking. What is the treatment for electric shock, and how would you liberate the subject from live wire? etc., etc., etc.

Fifth Test.—Under what heads may poisons be classified? What poisons give rise to convulsions, delirium, failure of respiration, and collapse? What are the signs, symptoms and treatment for poisoning by alcohol, opium, poisonous acids and alkalis? State the best methods for making a person vomit. What would you do with a person apparently drowned? etc.

As soon as the instructor considers the class ready for examination, he makes his report to the proper quarter, and a medical officer is then appointed to examine the class, and all who pass the examination satisfactorily are given the certificate of the St. John Ambulance Association, certifying that they are qualified to render first aid to the injured. After the examination the men are given one hour a month in order to meet together for practice, and are by this means kept up to a proper state of efficiency, also, at stated intervals, the men are inspected by a medical officer appointed by the management, so that the company's officials can see for themselves if their men are up to date, and able to do the work required of them.

The examinations are carried out with the greatest strictness practicable. Definite subjects are laid down, in which candidates are to be examined, and the same fixed number of subjects for each candidate, but arranged in such a manner that no candidate will know which subject will be selected for him, and will thus have to study all. Notwithstanding, every candidate will have the same chance. There is a fixed minimum of total marks for all the subjects selected, together with a fixed minimum of total marks for each subject, so that by this system every man has to pass a general aggregate of marks, and must also know each subject. Ignorance on an essential point disqualifies the candidate, whatever the total marks gained, or whatever the general knowledge may be. Supposing a candidate does not know how to stop an artery from bleeding, it would not matter how much else he knows, he would be disqualified. The examination is thus made fair, thorough, definite and uniform.

First aid is still a novel idea to the great mass of the working population in Canada; it forms to them, in fact, a new departure in the conduct of life, and, as in the case of all new departures, it requires much time, care, patience and effort to bring its value home to the people. All who will help to do so will perform thereby, not only an act of charity, but will be forwarding a movement of great national importance.

I would insist that every railway official should take at least one course of lectures, for in scarcely any walk of life is there so great a need of intelligent assistance on the spot, as in the various ramifications of railway life. All are liable to accident, therefore, all must be depending to a more or less extent on these first aid principles.

No sane person desires, should he unfortunately suffer serious accident, to have the injury aggravated or his life sacrificed by the well meant but ignorant attention of bystanders, or for the want of a little intelligent first aid knowledge, the learning of which would only take a few hours of a person's lifetime.

Canadian Pacific Railway Company.

Office of Superintendent Angus Loco. Shops,
Montreal.....190..

SUBJECT

Ambulance man's report in connection with accident at the Angus Locomotive Shops.

Name of person injured .....
Description of injury .....
How accident was treated .....
Material used .....
Signature .....
Ambulance man.
.....
Supt. Loco. Shops.

Note—The above is to be filled in by the Ambulance man who renders first aid and sent to the office of the Supt. of Angus Loco. Shops as soon as possible after the accident.

The C.P.R. classes in Montreal include some 500 men. Classes have also been organized at St. John, Carleton, Woodstock, Aroostook Jct., and McAdam Jct., N.B.; Brownville Jct., Me.; Ottawa and Toronto, Fort William and Kenora, Ont.; Winnipeg and Brandon, Man.; Moose Jaw, Sask.; Medicine Hat, Lethbridge and Calgary, Alta.; Cranbrook, Nelson, Eholt, Revelstoke and Vancouver, B.C., and many other points.

The C.P.R. centre of the St. John Ambulance Association has the following officers:—Patrons:—Lord Strathcona and Mount Royal, Sir Thos. G. Shaughnessy, Sir Wm. Whyte, R. B. Angus. President, D. McNicol. Vice Presidents, J. W. Leonard, George Bury, H. H. Vaughan; Grant Hall, W. R. Baker, G. P. Girdwood, M.D., A. D. MacTier, C. Murphy, H. A. Beatty, M.D., M.R.C.S., Eng. Chairman, L. R. Johnson. General Secretary, S. A. Gidlow.

Lifting an injured workman.

Canadian Northern Railway Construction, Betterments, etc.

James Bay and Eastern Ry.—The Board of Railway Commissioners has approved of location plans for this line in Roberval tp., Que.

Grading on the line from outside Roberval was on July 19, reported to have been practically completed to Chute a l'Ours, about 30 miles, and track laying will be started Aug. 1. J. P. Mullarkey is the contractor. It is said that the line will be extended along the valley of the Ashuapmouchouan River, and through the Chibougamou country, to Nottaway Bay or James Bay.

Montreal Tunnel and Terminal Construction.—The company's plans for the tunnel from the north side of Lagauchetiere St. to the new town on the western side of Mount Royal, were approved by the Board of Railway Commissioners, July 11. The question of the overhead viaduct from Lagauchetiere St., to the harbor front was left over in order that the Montreal city council might have a further opportunity to study the plans submitted.

Preliminary work in sinking shafts at the city end of the tunnel was started July 13, and it was expected that boring operations would be started by July 30. It is estimated that 1,000,000 cubic yards of material will be excavated from the tunnel, and an additional 500,000 cubic yards from the excavations for the central station.

The Montreal city council gave consideration, July 21, to the company's plans to connect the tunnel up with the station in the east end at Moreau St., The route to some extent parallels the Lachine, Jacques Cartier and Maisonneuve Ry., and in approving it, the council reserved rights as to crossings of all present and future streets. This matter will be dealt with later on.

Montreal-Ottawa-Port Arthur Line.—Prior to leaving Montreal for England, June 26, Sir Wm. Mackenzie is reported to have said that the proceeds of the $35,000,000 of bonds guaranteed by the Dominion Government for the building of the line was in the bank, and the contractors had 7,000 men at work pushing the different sections of the line to completion. The work would be completed by the end of 1914.

The first section of the line extends from Montreal to Hawkesbury, Ont., 58 miles, construction on which is well advanced and is expected to be completed this year. J. P. Mullarkey has the contract for this section of the line. The line from Hawkesbury to Ottawa has already been completed and is in operation. From a point outside Ottawa to Pembroke, 90 miles, grading is being pushed forward. J. P. Mullarkey being the contractor for this work also. It is expected to have track laid to Fitzroy harbor, 25 miles, this year.

G. A. Mountain, Chief Engineer of the Board of Railway Commissioners, has spent some time in North Bay, investigating the different routes recommended for the line through the town, and to plan a line which will meet the objections made to that surveyed by the company.

The Board of Railway Commissioners has approved of revised location surveys for the line through Badgerow, Field and Gibbons townships, northwest of North Bay. The Board has also approved of revised location plans for the line from mileage 208.3 to 211.47 west of Sudbury Jct.

Steel is reported to have been laid from Port Arthur, easterly to the mouth of the Mackenzie River, where a temporary bridge has been built and across which a temporary track has been laid. The Kennedy Construction Co. is reported to have the contract for the erection of the concrete piers and abutments for the permanent bridge. It is expected that these will be completed in the spring.

Canadian Northern Ontario Ry.—The Board of Railway Commissioners has authorized the operation of traffic over the line from Toronto to Deseronto, Ont., rescinding previous orders. Work is well advanced on the line to Sydenham, which includes the cut offs on the Bay of Quinte Ry., the contract for which is being carried out by Angus Sinclair. From Sydenham to Ottawa, 90 miles, J. P. Mullarkey, is carrying out the contract for the greater part of the work, Ewen Mackenzie having completed the grading on the 20 miles from mileage 180 to 200. On this 90 miles track is reported to have been laid from Ottawa to the Rideau River, and track is also being laid westerly from Sydenham. Another track laying gang is preparing to start work at Forfar, where the line crosses the Brockville, Westport and Northern Ry.

A route map has been approved by the Minister of Railways for the company's projected line easterly from North Toronto for 7.2 miles.

Sir Wm. Mackenzie is reported as having recently stated that the company's plans included the laying out of large yards and shops at Leaside Jct., and smaller shops on the Rideau River, near Ottawa. The principal shops of the company would be those at Leaside Jct., near Toronto, and at Port Mann, B.C. A new building for the head offices would be erected in Toronto. The union station to be erected at North Toronto by the C.P.R. would be the company's principal station in the city, although a few of the trains might run into the Front St. station.

The Minister of Railways has approved of a route map for the company's proposed line through the counties of Lincoln and Welland, Ont.

Canadian Northern Ry.—The new train shed of the Fort Garry union station at Winnipeg, was opened for traffic June 24. There are six tracks in the shed, which is being used by the C.N.R., the G.T. Pacific Ry., and the Great Northern and Northern Pacific Railways.

Considerable improvements are being made in the company's yards at St. Boniface, Man. It is reported that $75,000 will be expended on the work before the end of the season.

The Board of Railway Commissioners has approved of location plans for a branch line through tps. 30-34, range 4, west of the second meridian, Sask., and through tps. 24-22, range 1, west of the 5th meridian, and range 29, west of the 4th meridian, Alta.

Work is reported to have been started on a 10-stall roundhouse with a machine shop attached at Radville, Sask. This is a divisional point on the company's line from Maryfield to Lethbridge, Alta.

M. H. MacLeod, General Manager, is reported as stating that the line into Calgary, Alta., will be completed by September. This line is to be continued southerly to Macleod, and the route plans for 12 miles southerly and westerly have been approved by the Minister of Railways. Construction on this line was started at the Macleod end, the Northern Construction Co. having the contract. Mr. MacLeod is also reported as stating that a contract will shortly be let for the remaining mileage into Calgary.

Canadian Northern Pacific Ry.—The supervision of the construction of the company's line from the Yellowhead Pass to the Pacific coast has been divided between the company's Winnipeg and Vancouver offices. T. H. White, who had charge of the final location surveys, and has been Chief Engineer for the C.N.P. Ry., has charge of the construction from the Pacific coast to the Albride summit, while the remaining mileage from Albride summit to the Yellowhead Pass is being supervised from the Winnipeg offices. The construction headquarters of the Northern Construction Co., which has charge of the contract for the line from Kamloops to the Yellowhead Pass for itself and Foley, Welch and Stewart, advised us recently as follows:—McDonald Bros., who have a subcontract for the first 20 miles from Kamloops northeasterly, have practically completed the grading. The next 10 miles was sublet to Boyd and Craig, who have about two months' work yet to do to complete. The next 30 miles has been sublet to Murdoch and Co., who have made good progress during the three months they have been at work. There are about 500 men, including station gangs on this section. The sub-contract for the next 100 miles has been sublet to Twohy Bros. Co., who have two complete steam shovel plants on the ground and are busy taking in supplies, making two complete trips a week. Twohy Bros.' own steamboat goes up the Fraser River as far as mileage 100. The remaining mileage to the Albride summit, it was expected would be sublet at an early date.

Press reports state that contracts have been let for the ten bridges described on pg. 337 of our last issue as follows:—Substructures for seven of the bridges, Armstrong and Morrison, Vancouver, B.C.; substructure for one bridge, John Galt Engineering Co., Winnipeg; substructure for two bridges, C. F. Graff, Seattle, Wash., has the option of a refund at certain prices. The Dominion Bridge Co. has the contract for six of the superstructures, and the Canadian Bridge Co., Walkerville, Ont., the contract for the other four.

Surveys are being made for a branch line from Kamloops through Vernon to Kelowna, at which point a terminal site of 17 acres fronting on Okanagan Lake has been acquired. Press reports state that tenders will shortly be asked for the building of the line.

Press reports state that a contract has been let for the grading at the terminal yards at Port Mann. The contract, it is said, involves the raising of the level of the area by 4 ft., requiring the bringing in of 350,000 cubic yards of material. The yard will have room for 60 miles of track of which 30 miles will, it is said, be laid this year.

The line between Port Mann, and Hope has been completed, and a regular daily freight and passenger service will be put in operation Aug. 1. Press reports state that tenders will shortly be asked for the erection of the stations on this section of the line. Easterly from Hope the line is practically completed to near Rosedale; track has been laid to the Coquihalla River, and ballasting is in progress. The superstructure of the bridge across the Coquihalla River is being built, and it is expected that the grading will be completed as far as Yale, early in September. The boring of the tunnel at Yale is expected to be completed by Dec. 31, and beyond that point the work is well advanced to North Bend.

Sir Donald Mann, Vice President, is reported as having stated in Vancouver, July 6, that nothing would be decided about the company's terminals in that city until the city council had decided as to the disposal of the False Creek property. The location of terminals would determine the route and manner of the entrance of the line. The company would have an entrance independent of other lines.

Canadian North Eastern Ry.—The Minister of Railways for British Columbia, has approved of route map for the extension of the company's line from mileage 13.5 out of Stewart to the junction of the Naas and Blackwater rivers, 91.5 miles; of the route map of a branch line up the north fork of the Naas River, 50 miles: and of a branch starting from the Blackwater River for 95 miles, to the G.T. Pacific Ry. crossing of the Skeena River, 16 miles below Hazleton

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The Great Northern Railway's Policy in Canada.

Carl R. Gray, President, Great Northern Ry., writes Canadian Railway and Marine World, from St. Paul, Minn., under date of July 13 as follows:—

"My attention has just been called to an editorial in your July issue. Will you not do me the justice to print my unqualified denial of the correctness of any portion of the statement which you have quoted, and my additional assurance that I did not say to any one anything which would justify the alleged interview? The dispatch was sent out from Spokane, Wash., before I became officially connected with the Great Northern, and even before any official announcement had been made of my appointment. I had never been in Canada and I had not the slightest knowledge at the time of any of the plans of the Great Northern. Inasmuch as the only Canadian lines which we have in mind are intended to connect up with Vancouver as a port, and as none of them serve a country which could be called specially a grain growing section, the utter absurdity of the statement can be easily appreciated.

"This unauthorized and untrue interview has been very widely quoted, and I have recognized the utter futility of attempting to deny it in every quarter, but in view of the fact that you have accepted it as true and drawn from it certain conclusions (which I must admit on its face were justifiable, but which, in view of the facts, constitute an injustice both to the Great Northern Ry. and to myself), I am sure that it is only necessary to call your attention to the matter to secure equal publicity for my denial."

Had the interview referred to appeared in a daily paper as an ordinary press dispatch, we should not have paid any attention to it, but it was published in Engineering News, of New York, a technical paper with a reputation for accuracy, and we therefore accepted it as authentic. It credited Mr. Gray with stating as follows:—

"Millions of dollars are to be expended this year and next year in extending lines into the virgin territory of Washington and Oregon, and into the province of British Columbia. The plan is to drain the rich grain fields of Western Canada by means of north and south feeders. Contracted work in eastern Washington to the Pacific coast will be rushed to completion, and additional contracts will be awarded soon for extensive development in Northern Washington. Development of subsidiary lines in Oregon will be carried out by J. H. Young, the new President of the Spokane, Portland and Seattle Rd. and other Hill lines. The Northwest is our territory, and we are planning to strengthen our position in all parts of the western country."

We have pleasure in giving Mr. Gray's denial equal publicity. His statement that the only Canadian lines which his company has in contemplation are to connect up with Vancouver as a port is significant. But the fact must not be lost sight of that in addition to the arrangement under which the G.N.R. crosses the International Boundary and reaches Winnipeg over the Canadian Northern Ry. it has also crossed at two other points in Manitoba and has built lines to Portage la Prairie and Brandon, which certainly are draining "the rich grain fields of Western Canada by means of north and south lines."

A glance at the G.N.R.'s map will show that it has eleven other branch lines running northeasterly from its main line towards the International Boundary south of Manitoba and Saskatchewan, some of them being built almost to the boundary. Rightly or wrongly, the impression prevails that it has been the G.N.R.'s intention to extend some or all of these lines into Canada, and had the reciprocity treaty been ratified, the probability is that some at least of such extensions would have been already made or under way.

Orders for Construction of Toronto Union Station and Viaduct.

The Board of Railway Commissioners passed order 17034, July 18, as follows.— Re consideration of plans of new union station, Toronto, filed by the railway companies: Upon the hearing of the matter at the sittings of the Board in Toronto, May 24, the Grand Trunk and Canadian Pacific Railway Companies and the city of Toronto being represented by counsel at the hearing, and what was alleged, it is ordered that the plan of the said proposed new union station, submitted by the G.T.R. Co., dated Jan. 17, 1912, and filed with the Board as plan A, be approved: the work of constructing the said station to be commenced forthwith and completed not later than Sept. 1, 1914; and that the railway companies be liable to a penalty of $100 a day for every day they are in default under this order, with leave to move to extend the time, or to be relieved of such penalties, if any, if the facts warrant such application.

THE ORDER FOR THE VIADUCT.

The Board passed the following order 17033, July 18:— Re separation of grades in the city of Toronto, and order 7200, dated June 9, 1909, as amended by orders 13568 and 16019, dated April 25, 1911, and Feb. 22, 1912, respectively, it is ordered that the work ordered to be done under order 7200, as amended by orders 13568 and 16019, be commenced forthwith and completed on or before Sept. 1, 1914; and that the railway companies be liable to a penalty of $100 a day for every day they shall be in default under this order, with leave to move to extend the time, or to be relieved of such penalties, if any, if the facts warrant such application.

Railway Lands Patented.—Letters patent were issued during May for railway lands in Manitoba, Saskatchewan, Alberta and British Columbia, as follows:—

	Acres.
Canadian Northern Alberta Ry.	15.87
Canadian Northern Ry.	9,897.94
Canadian Pacific Ry.	48.24
Grand Trunk Pacific Ry.	48.946
Qu'Appelle, Long Lake and Saskatchewan Rd. and Steamboat Co.	1,359.62
Total	11,370.616

The C.P.R. and the Canadian Northern Ry. each subscribed $5,000 to the fund raised to aid those who suffered loss in the recent cyclone disaster at Regina, Sask.

The Brandon, Man., council unanimously passed a resolution, July 16, in favor of laying a double track on Tenth St., from Princess St. to Victoria St., and on July 18, the Mayor stated that he had veoted the resolution.

The Nelson Electric Ry. Co., notified the city council, July 16, that it could not entertain the council's offer of $75,000 for the line. The company suggested that a conference be held at which a price might be fixed.

J. A. Boswell, who has retired from the Superintendency of the Eastern Division, Dominion Ex. Co., Montreal, was entertained to dinner at the Montreal Club recently, by his friends and business accosiates. He was subsequently presented with an illuminated address containing the signatures of the company's chief employes, and a walrus suit case, with a gold watch bracelet for Mrs. Boswell. He was born at Columbus, Ohio, in 1840, and entered the express business in 1861, with the United States Ex. Co., on the Pennsylvania Rd., and served with that company until 1888, when he joined the Dominion Ex. Co.

Mainly About Transportation People.

SIR WM. MACKENZIE sailed from England for Canada, July 24.

LORD STRATHCONA, has contributed $4,000 to the Y.W.C.A. building fund at Berlin, Ont.

R. BARRY SMITH, chief law clerk, Intercolonial Ry., died at Moncton, N.B., July 16, aged 60.

N. MacDOWELL, of the North Shore Power Ry. and Navigation Co., died at Clarke City, Que., July 14.

SIR DONALD MANN, has given $1,000 in aid of those who suffered loss in the recent fire at Chicoutimi, Que.

G. M. BOSWORTH, Vice President, C.P.R., has taken a summer cottage at St. Andrews, N.B., for the season.

L. H. McNAMARA, town ticket agent, G.T.R., Walkerton, Ont., has joined the Canadian Ticket Agents' Association.

F. H. PHIPPEN, K.C., General Counsel, Canadian Northern Ry., Toronto, has purchased a 50 acre property at Dixie, near Toronto.

E. N. BENDER, General Purchasing Agent, C.P.R., accompanied by Mrs., and Miss L. Bender, have returned to Montreal, from Great Britain.

MRS. MacTIER, wife of A. D. MacTier, Assistant to the Vice President, C.P.R., Montreal, and family, are spending the summer in Great Britain.

LADY SHAUGHNESSY, and the Misses Shaughnessy are occupying their summer home, Fort Tipperary, St. Andrews, N.B., for the season.

F. L. WANKLYN, M. Can. Soc. C.E., General Executive Assistant, C.P.R., Montreal, arrived in Canada, July 5, from Great Britain with his bride.

A. PRICE, General Superintendent, C.P.R., Calgary, Alta., is building a residence on Prospect Ave., Mount Royal, in that city, at a reported cost of $20,000.

J. G. SCOTT, ex-General Manager Quebec and Lake St. John Ry., and Mrs. Scott, left Quebec, July 4, for a summer vacation at Carelton, Baie des Chaleurs.

J. J. NICKSON, who carried out the first contract for the C.P.R. Irrigation project at Calgary, Alta., at a cost of about $2,000,000, died at Vancouver, July 10, aged 64.

MRS. R. S. McCORMICK, wife of the Chief Engineer, Algoma Central and Hudson Bay Ry., died June 16 and was buried at Indianapolis, Ind. She left a baby daughter and son 4½ years old.

SIR WM. WHYTE, G. F. Galt and A. M. Nanton are reported to have been appointed by the Hudson's Bay Co., as a local board at Winnipeg, to supervise its business in Canada.

A. W. SMITHERS, Chairman of the Board, G.T.R., is expected in Montreal, early in August, for the purpose of making his annual inspection of G.T.R. and of the G. T. Pacific Ry.

J. N. HILL, Vice President, Northern Pacific Ry., New York, and son of J. J. Hill, of the Great Northern Ry., has resigned, and it is stated, he will spend a long vacation in Europe.

L. R. JOHNSON, M. Can. Soc., C.E., Superintendent Angus shops district, C.P.R., left Montreal for Europe, July 5 on the company's business and is not expected back for some time.

HON. F. COCHRANE, Minister of Railways and Canals, has been nominated to represent the Dominion Government at the International Road Congress in London, Eng., in June, 1912.

H. L. DRAYTON, K.C., who has been appointed Chief Commissioner, Board of Railway Commissioners, has, preparatory to taking up residence in Ottawa, sold his house in Toronto for about $20,000.

W. F. PAGE, who entered G.T.R. service in 1852, at Montreal, and who was one of the engine drivers on trains from Montreal westward when traffic was opened in 1855, died at Brockville, Ont., July 7.

The lake near Aldermere B.C., which has hitherto been known as Chicken Lake, is to be named Kathlyn Lake, in honor of the daughter of W. P. HINTON, General Passenger Agent, Grand Trunk Pacific Ry.

"If there were a competition at the Olympic games for ocean travellers, Canada might well have entered SIR WILLIAM MACKENZIE with a fair expectation of winning first place."—Toronto Mail and Empire.

T. HALL was presented with a silver tea set by the employes of the Michigan Central Rd., building department, St. Thomas, Ont., on his recent promotion to be Assistant General Superintendent of Buildings at Jackson, Mich.

G. STEPHEN, General Freight Agent, Canadian Northern Ry., Winnipeg, was mentioned in Canadian Railway and

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J. A. Glassford,
Terminals Manager. Fort Garry Union Station, Winnipeg.

Marine World for July, as having been born in Montreal, July 5, 1870. The year should have been given as 1876.

H. P. DWIGHT, President, Great North Western Telegraph Co., Toronto, died July 4, aged 84. In our last issue, we gave some details of his illness, with biographical data. Mrs. Dwight, who had been ill for a few days, died July 14, aged 77.

W. B. SMITH, General Manager, Dominion Transport Co., Montreal, who celebrated his 83rd birthday recently, entered the Shedden Forwarding Co.'s service at London, Ont., in 1855, and established the D.T.C. at Montreal on the organization of the C.P.R.

G. McL. BROWN, European Manager, C.P.R., London, Eng., and Mrs. Brown, arrived in Montreal from England July 13. After spending a few days in Montreal, Mrs. Brown went to Hamilton to visit relatives, and Mr. Brown left on a trip to the Pacific coast.

G. H. HAM, head of the C.P.R.'s publicity department, was entertained at dinner in Montreal recently, by the British manufacturers who have been touring Canada and was presented with a gold cigarette case, in appreciation of his services during their trip.

W. P. CHAPMAN, Resident Engineer, Mackenzie, Mann and Co., Toronto, who was married, recently, to Miss Chapman, of Toronto, was presented by the staff, with a cut glass service.

W. H. FLYNN, was presented with an address and a gold watch and chain, by the employes of the mechanical department of the Michigan Central Rd. in Canada, on his recent removal from St. Thomas, Ont., to take up his new duties as Superintendent of Motive Power at Detroit, Mich.

L. GLEASON, travelling expert, Galena-Signal Oil Co., who at one time had his headquarters in Canada, but is now located in Chicago, made his yearly business trip to Newfoundland early in July, and then sailed from St. John's for England for a holiday, intending to return to Chicago early in September.

H. M. KING, Chairman of the London and Dominion Trust Co., London, Eng., returned to Montreal July 19, from Alberta, where he had been in the interests of the Alberta, Peace River and Eastern Ry., which his company is arranging to finance. Mr. King is returning to London, to complete the arrangements.

H. E. FARRELL, who has been appointed Vice President, St. Louis Southwestern Ry. of Texas, in charge of freight traffic, was some years ago, in the service of the Detroit, Grand Haven and Milwaukee Ry., and the Great Western Ry. of Canada, at Detroit, Mich., both of which lines now form part of the G.T.R. system.

C. W. BURPEE, Superintendent, District 1, Atlantic Division, C.P.R., was entertained at a smoking concert at McAdam Jct., N.B., July 10, and presented with two travelling bags and a cheque for $410, by the officials and employes of the division, on his transfer to Toronto, as Superintendent, District 1, Ontario Division.

C. D. WARREN, of Toronto, and C. E. A. CARR, of New Orleans, La., formerly of Quebec, are President and Vice President respectively of the New Orleans and Western Ry. Co., which has been incorporated at New Orleans, under the Louisiana State laws, with an authorized capital of $1,500,000 and very extensive powers.

J. H TELFER, who retired from the position of Weighing Inspector, G.T.R., Toronto, July 1, after 46 years continuous service with the company, was presented with a silver tea service by his fellow officials, recently, the presentation being made at the Canadian Freight Association's annual meeting at Lake Champlain, N.Y.

J. B. INGERSOLL was presented with a gold watch and chain by the staff at the Lake Buntzen generating station, and a club bag by the men of Department B., of the British Columbia Electric Ry. July 13, on his leaving that company's service to take up the duties of his new position with the Kootenai Power and Construction Co., Spokane, Wash.

GEORGE B. WILLIAMS, until recently Car Service Agent, Manitoba Division, C.P.R., has joined the Railroaders' Investment Co., of which Alex. Shields, formerly General Master Mechanic, Canadian Northern Ry. is the President. The company has its head office at Winnipeg, and its operations will extend over the entire Dominion, as agencies are being established in the prominent centres.

J. D. BEATTY, who died at Sarnia, Ont., July 14, aged 74, was connected with steamship interests on the Great Lakes for several years, and was one of the founders of the North West Transportation Co., operating between Sarnia and Duluth, being General Manager until its absorption by the Northern Navigation Co. in 1902. Up to within a few

months of his death, he was President, Sarnia St. Ry. Co.

H. W. MILLS, Manager, Sarnia Street Ry., and Town Ticket Agent, G.T.R., died at Sarnia, Ont., June 6, aged 62. The funeral, under Masonic auspices, was largely attended. Flowers were sent by the Canadian Ticket Agents' Association, of which he was a member for many years, and the Association was represented by its Secretary, E. de la Hooke. This item was written for our last issue, but was left out by an oversight.

R. A. SMITH. of Osler and Hammond, brokers, etc., Toronto, who was killed in an automobile accident July 17, on coming to Canada some 30 years ago from Scotland, entered railway service as a clerk in the old Northern Ry.. At the time of his death he was a director of the Toronto Ferry Co., and of the Victoria Rolling Stock and Realty Co. of Ontario. At one time he was secretary of the Qu'Appelle, Long Lake and Saskatchewan Railroad and Steamboat Co.

HON. F. COCHRANE, Minister of Railways, left Ottawa, June 26, on a trip of inspection of the railways in north western Canada. He arrived in Winnipeg July 3, after having visited North Bay, Sault Ste. Marie and Fort William, Ont., and went on to Vancouver, and thence to Prince Rupert, B.C. He is expected back in Winnipeg early in August, and proposes to begin an inspection of the route of the line under construction to Hudson Bay, Aug. 10, expecting to return to Ottawa, via the Hudson Straits.

MRS. BRYDGES, who died at Winnipeg, July 7, was the widow of the late C. J. Brydges, at one time the most important railway official in Canada. He was appointed Managing Director, Great Western Ry. of Canada in 1853, and was subsequently General Manager of the Grand Trunk Ry. and General Superintendent of Government Railways, respectively. He was one of the commissioners in charge of the building of the Intercolonial Ry,, and in 1878 was appointed Land Commissioner, Hudson's Bay Co., at Winnipeg.

B. W. FOLGER, who recently retired as General Manager, Niagara Navigation Co., Toronto, on its being taken over by the Richelieu and Ontario Navigation Co., was presented with a loving cup and travelling bag, and a travelling bag for Mrs. Folger, by the officials and employes of the company. The presentations were made by S. J. Murphy, and A. J. Woodward, formerly Travelling Passenger Agent, and Superintendent Engineer, respectively. It is stated that Mr. Folger will probably leave Toronto for New York in the fall.

C. H. BOOTH, whose appointment as Local Freight Agent, Midland Ry. of Manitoba, Winnipeg, was announced in a recent issue, was born at Banff, Scotland, Feb. 16, 1882, and entered railway service, July 1900, since when he has been, to June, 1902, general clerk, C.P.R., Winnipeg; June 1902 to Aug. 1904, billing clerk, Canadian Northern Ry., Winnipeg; Aug., 1904, to Apr. 1906, chief billing clerk, same road; Apr. 1906 to June 1907, inward rate clerk, same road; June 1907 to May 1908, chief rate clerk, same road; May 1908 to Oct. 1909, accountant, same road; Oct. 1909 to May 15th, 1912, assistant local freight agent, same road.

NICOL KINGSMILL, K.C., who died at Toronto, July 21, was born Sept. 30,1834, and was the youngest son of the late Col. Kingsmill, who served in the Peninsular war, and was afterward sheriff of Niagara, and later postmaster of Guelph, Ont. Nicol Kingsmill was senior partner of the firm of Kingsmill, Saunders, Torrance and Kingsmill, Canadian solicitors for the Michigan Central Rd., and was a director of the Canada Southern Ry., and subsidiary companies, and also of the Toronto, Hamilton and Buffalo Ry. Rear Admiral C. E. Kingsmill, of the Canadian Naval Department, is a nephew, and W. B. Kingsmill, of the firm mentioned above, is a son.

D. F. MAXWELL, M. Can. Soc., C.E., whose portrait appears in this issue, has been professionally connected for the last 30 years with various railways and other public works in the Maritime Provinces, as well as with several railways in the New England States. During the past eight years he has been wholly engaged in railway work in New Brunswick, four years of that time having been spent on location and construction on the National Transcontinental Ry., and the balance in charge of surveys for the St. John Valley Railway and the Fredericton and Grand Lake Coal and Ry. Co. He was recently appointed Engineer of Railways for the New Brunswick government.

JAMES MILNE, heretofore Superintendent Canadian Salt Co.'s works at Windsor, Ont., and Consulting Engineer. Sandwich, Windsor and Amherstburg Ry. has been appointed Electrical and Mechanical Engineer for the city of Toronto, at a salary of $5,000 a year. He was born in Scotland some 45 years ago, and

P291 D. F. Maxwell,
Engineer of Railways for the New Brunswick Government.

has been in Canada for about 20 years. Soon after coming to Canada he was appointed teacher of mechanical and electrical engineering in Toronto Technical School and was subsequently in the service of the Toronto Incandescent Lighting Co., of the Jones Underfeed Stoker Co., and the British Columbia Electric Ry.

W. J. PICKRELL, whose appointment as Master Mechanic, District 1, Ontario Division, C.P.R., West Toronto, Ont., was announced in a recent issue, was born at London, Ont., Sept. 15, 1880, and entered C.P.R. service, Jan. 1, 1899, since when he has been, to July 1, 1901, in the West Toronto shops; July 1, 1901 to Nov. 1, 1904, fireman; Nov. 1, 1904, to July 7, 1905, travelling fireman; July 7, 1905 to Aug. 1, 1907, driver; Aug. 1, 1907 to Apr. 15, 1908, assistant Road Foreman; Apr. 15, 1908 to May 10, 1910, driver; May 10, to Dec. 16, 1910, rule instructor; Dec. 16, 1910, to Apr. 9, 1912, driver; Apr. 9, to May 15, 1912, acting District Master Mechanic, District 3, Ontario Division, West Toronto.

K. J. BURNS, whose appointment as Assistant General Freight Agent, Great Northern Ry., Vancouver, B. C., was announced in our last issue, was born at Rochester, Eng., Oct. 11, 1878, and arrived in Canada in 1882. He entered railway service June 1893, since when he has been, to Feb. 1898, stenographer, C. P. R., Victoria, B. C.; Feb. to June, 1898, second purser, C. P. R. s. s. Empress of China; June to Oct. 1898, ticket clerk, Great Northern Ry., Victoria, B. C.; Oct. 1898 to May 1900, freight solicitor, same road, Vancouver, B. C.; May 1900 to May 1902, General Agent, same road, Tacoma, Wash.; May 1902 to May 1905, General Agent, same road, Victoria, B. C.; May 1905 to June 1, 1912, General Agent, same road, Vancouver, B. C.

T. McNABB, who resigned his position as Master Mechanic, Alberta Railway and Irrigation Company in May, 1911, was, in view of his long and efficient services, given leave of absence on full pay until the company's lines were taken over recently by the C.P.R. After travelling during the greater part of the past twelve months, Mr. McNabb has retired to his Rockyford ranch in Alberta, which he established in 1902, and looks forward to a life of comparative ease after 49 years continuous railway service with two companies. He is one of the oldest subscribers to this paper, and writes: "Please continue to send me The Railway and Marine World, as I do not wish to get entirely out of touch with the old associations. I congratulate you on the continued improvement in your paper."

E. LAIT, who has been appointed General Yardmaster, Winnipeg Joint Terminals, was born at Toronto, Aug. 23, 1889, and entered railway service, July 9, 1902, since when he has been, to Apr. 3, 1904, car checker, C.P.R., Toronto; Apr. 3, 1904 to Aug. 1, 1905, car checker, Canadian Northern Ry., Winnipeg; Aug. 1, 1905 to Oct. 25, 1907, night terminal clerk, same road; Oct. 25, 1907 to Jan. 9, 1909, freight brakeman, same road; Jan. 15, 1909, to Nov. 16, 1910, switchman, same road; Nov. 18, to Dec. 19, 1910, brakeman; Chicago and North Western Ry., Chicago, Ill.; Dec. 26, 1910, to Sept. 14, 1911, switchman, same road; Sept. 15, to Nov. 18, 1911, night Yardmaster, Canadian Northern Ry., Winnipeg; Nov. 19, 1911, to June 20, 1912, switchman, same road; June 20 to June 28, 1912, Night Yardmaster, Winnipeg Joint Terminals.

H. J. BEEMER, who died in London, Eng., towards the end of June, was born at Homesdale, Pa., in 1848. He commenced his railway career as a foreman for Smith and Ripley, New York, who brought him to Canada. One of his first works as a contractor was the railway bridge at Ottawa, followed by some portions of the Dufferin improvements at Quebec. He was Managing Director, Quebec and Occidental Ry. in 1887, and later built the water works in Quebec city. His most important works after that were the Ottawa and Gatineau Ry., the Pontiac Pacific Jct. Ry., and the Quebec, Montmorency and Charlevoix Ry., and the Montreal and Western Ry. In 1895 he made a contract with the Quebec city council for the construction of an electric railway there. In 1905 he left Canada for the United States and for some time was engaged in mining in Arizona.

A. C. GRAY, M. I. M. E. (Eng.), whose appointment as Superintendent of Motive Power, Reid Newfoundland Co., St. John's Nfld., was announced in our last issue, served a five years apprenticeship with Neilson and Co., now the North British Locomotive Co., Glasgow, Scotland, and entered North British Ry. service there, as a running shed fitter. He was subsequently, Locomotive Foreman, Chief Assistant Locomotive, Carriage and Wagon Superintendent, and General Workshop Superintendent, Southern Brazilian Ry., Rio Grande de Sul, Brazil, and on the sale of the railway, he was retained by the new management as Chief

Mechanical Engineer and Manager of Rolling Stock. Other positions held by him are, Engineer, to report on the Longitudinal Ry., Chili, for the Chilean Government; Chief Consulting Engineer, Hamburg South American Steamship Co.; Honorary Engineer, Customs Department, Rio Grande de Sul, Brazil; Assistant Manager and Chief Engineer, Rasselpur Tea Co., Sylket, India.

J. H. CALLAGHAN, General Storekeeper, C.P.R. Eastern Lines, Montreal, who died recently, was buried at Brownville Jct., Me., July 3, when the funeral was attended by chiefs of the operating department from various points. C. Murphy, General Superintendent of Transportation represented the management, L. R. Johnson. General Superintendent, Angus Shops District, the locomotive and car departments; G. E. Hall, Assistant General Storekeeper, the stores department; H. Ferguson, the purchasing department, and C. Malcolm, the audit department. W. Downie, General Superintendent, Atlantic Division, and H. C. Grout, Superintendent, Montreal, also attended. Mr. Callaghan entered C.P.R. service 26 years ago, as storekeeper during the construction of the road through Maine, being the first resident storekeeper at Brownville Jct. He was afterwards moved to McAdam Jct., N.B., then Farnham, Que., and later to Montreal, where he eventually became General Storekeeper. He was widely known throughout Canada and the U.S.

LACEY R. JOHNSON, M. Can. Soc. C.E., who has been appointed General Superintendent Angus Shops District, C.P.R., Montreal, and whose portrait appears in this issue, was born at Abingdon, Berks, Eng., June 22, 1855, and educated at the Grammar School, there. He entered railway service as an apprentice at the Great Western Ry. works, Swindon, Wilts., June 1, 1870, and was Chief Engineer and Foreman of Mechanics at the Woolwich Arsenal, Jan. 1 to Aug. 1876, and fitter and erector Sept. 1876 to Nov. 1878; Manager, Davis and Sons' engineering works, London and Abingdon, Nov. 1878 to Aug. 1879. In Sept. 1879 he went to India as draughtsman on the Scinde, Punjaub and Delhi Ry., and was subsequently foreman of machine and erecting shops there. He left India on account of health, Mar. 1882, and entered G.T.R. service at Montreal as draughtsman, June 1882, and joined the C.P.R., Nov. 2, 1882, since when he has been, to Nov. 1885, General Foreman at Carleton Jct.; Nov. 1885 to May, 1886, Assistant Master Mechanic, Eastern Division, Chapleau, Ont.; May 1886 to Apr. 1901, Master Mechanic, Pacific Division, Vancouver, B.C.; and from the commencement of the trans-Pacific service, his jurisdiction extended over the engineering department of the vessels, during which time he spent three winters in Hong Kong superintending alterations and repairs to the company's vessels; Apr. to Sept. 1901, on the purchase of the Canadian Pacific Navigation Co. by the C.P.R., he was Superintending Engineer, of the combined fleets, which position was severed from the locomotive and car department; Sept. 1, 1901 to July 1, 1912, Assistant Superintendent of Motive Power, C.P.R., Montreal.

Willard Kitchen Co., Ltd., railway contractors, Grand Falls, N.B., writes:—"We think The Railway and Marine World a first-class paper."

The steamboat Columbia, engaged in the coal trade between Oswego, N.Y., and Montreal, was destroyed by fire at Ogdensburg, July 6.

The British steamship Wilhelmina, bound from QQuebec to Yarmouth, Eng., ran on the rocks at Peter's River, Nfld., June 30, and became a total wreck.

The name of Dredge No. 4, formerly owned by the Montreal Harbor Commissioners, has been changed by order in council to Manley and Co. No. 1.

Surveying Instruments-

By W. L. Mackenzie, M. Can. Soc. C. E., Bridge Engineer, Canadian Northern Ry.

Following is a summary of an address delivered before the Engineering Society, Manitoba University:—

The best tripod head is that which is strongest to resist torsional stress. The lugs should extend well down between the cheeks; the legs should fit close together when folded, and each should preferably be of one solid piece of wood.

The levelling screws should be of large diameter and easily accessible. They can with advantage be covered with chamois in winter. Personally, I prefer a 4 screw instrument on account of the increased rigidity it offers. For 3 screw instruments wing nuts should be used to clamp the screws when levelled up. Keep the levelling screws and centres clean and free from grit, using a little of the best watch oil for this purpose. In winter it is best to remove all oil.

For all ordinary purposes, including railway work, a circle graduated to minutes is sufficient, and if further accuracy

P292 A/C. Gray,
Superintendent of Motive Power, Reid Newfoundland Co.

is required, it may be obtained by repetition. The compass needle is little used except for checking deflections; a thin, light needle is desirable. The U type of standard is the most rigid; it should be very firmly fastened.

Inverting telescopes are decidedly better than erecting, giving more light, longer focus and better definition. Stadia hairs should be fixed and not adjustable. In examining an instrument, always test the object glass slide. It should be ground to an accurate fit, and if it is found to shake, good work cannot be done. The object glass should be achromatic and free from spherical aberration. The telescope should be tested for power. The sensitiveness of the plate bubbles should not be less than 1-10th inch for one minute of arc.

For a vertical circle a good type is a 60° arc attached to the outside of the standard and a vernier arm attached to the end of the horizontal arms. If a whole vertical circle is used, and it becomes bent, the whole instrument is put out of commission until the circle has been removed and straightened.

Many of the above remarks apply to levels also. The dumpy, although a little more troublesome to adjust, is much to be preferred to the wye level, which is easier to adjust, but usually needs adjusting oftener. I would refer those requiring further information to Prof. I. O. Baker's comprehensive book on Surveying Instruments.—Manitoba Engineer.

Railway Finance, Meetings, Etc.

Atlantic and Lake Superior Ry.—A meeting of the holders of certificates of participation in the A. and L.S. Ry. Trust Fund was held in Montreal, July 18, to authorize the trustees to be represented and to vote in favor of resolutions submitted at a meeting of shareholders of the Quebec Oriental Ry. (Matapedia section), called for July 18; to authorize the trustees to appoint the first committees of the bondholders in accordance with the respective trust deeds; to make alterations in constitution for the management of the trust fund by authorizing the election of a Vice Chairman, and to enable general meetings to be held in Paris, France; and to appoint an additional member to the committee of management.

Kingston and Pembroke Ry.—After the transaction of the regular business at the annual meeting of shareholders at Kingston, Ont., Aug. 14, a special meeting will be held to consider the expediency of leasing the line to the C.P.R., to approve of the terms, conditions and form of lease; and to decide upon the means to be adopted for raising funds to retire outstanding mortgage debentures; to authorize an issue of bonds and to approve of the terms of mortgage to secure the repayment of any bonds that the directors may be authorized to issue.

Morrissey, Fernie and Michel Ry.—Press reports state that the operations of the Crows Nest Pass Coal Co., for 1911, showed a net loss of $200,654. The company owns the M.F. and M. Ry., and it is said that the result of the operation of the line for 1911 showed a net loss of $18,299. The amount of bonds outstanding is $27,500, against $37,500, at the end of 1910.

Rutland Rd.—The United States Supreme Court at New York gave a decision July 5, continuing the temporary injunction restraining the New York, New Haven and Hartford Rd. from acquiring the majority stock of the Rutland Rd. from the New York Central and Hudson River Rd. The court is of opinion that the proposed transfer is in violation of the Sherman law.

Temiscouata Ry.—Gross earnings for April, $21,148; expenses, $14,381; net earnings, $6,767.

An Ottawa press dispatch of July 11, states that the Dominion Government has decided to call for tenders, shortly, for the construction of important harbor improvements at Victoria. It is stated that the work will cost over $1,000,000.

The recent newspaper report that J. T. Davie and Son, Levis, had disposed of their shipbuilding and repair plant, is incorrect. The salvage plant, consisting of the steamboat Lord Strathcona, the schooner G.T.D., with pumps, etc., were sold to the Quebec Salvage and Wrecking Co., Ltd., Montreal, as mentioned in a previous issue.

The Fort William Elevator Co., Ltd., has been incorporated under the Dominion Companies Act, with $500,000 capital and office in Winnipeg, to carry on a general elevator and grain warehouse business, and in connection therewith to own and operate steam and other vessels, and to conduct a general navigation business. The incorporators are, D. Horne, H. E. Swift, G. H. Yule, W. E. Davidson, M. M. Perdue, Winnipeg.

Transportation Appointments Throughout Canada.

The information under this head, which is almost entirely gathered from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who may notice any error in our announcements will confer a favor by advising us.

Board of Railway Commissioners.—H. L. DRAYTON, K.C., heretofore Counsel for the city of Toronto, has been appointed Chief Commissioner, vice J. P. Mabee, deceased.

Canadian Northern Ontario Ry.—R. A. BALDWIN, chief draughtsman, Mackenzie, Mann & Co., Ltd., has also been appointed Resident Engineer Canadian Northern Ontario Ry., Toronto-Niagara line. He is also in charge of the betterments being done on the Bay of Quinte Ry.

C. T. DELAMERE, has been appointed Assistant District Engineer, Port Arthur District, Sudbury-Port Arthur Line, vice A. J. Isbister, promoted to District Engineer, as announced in our last issue. Office, Port Arthur, Ont.

Canadian Northern Ry.—W. PHILLIPS, who was recently appointed European Traffic Manager, with office at London, Eng., has announced the following distribution of territory:—

W. J. CARTMEL, General Passenger Agent, Canadian Northern Steamships, in charge of all business originating in Europe. Office, London, Eng.

F. S. JONES, District Agent, Freight Department, C.N.R., and Freight and Passenger Departments, C.N. Steamships. Office, Glasgow, Scotland.

G. E. COWIE, District Agent, Freight Department, C.N.R., and Freight and Passenger Departments, C.N. Steamships. Office, Liverpool, Eng.

A. T. SHAW, District Agent, Freight Department, C.N.R., and Freight Department, C.N. Steamships. Office, Birmingham, Eng.

A. J. ADAMS, District Agent, Freight Department, C.N.R., and Freight Department, C.N. Steamships. Office, Bristol, Eng.

R. W. ROME, District Freight Agent, C.N.R., and C.N. Steamships. Office, London, Eng.

F. E. BIRCH, District Agent, Passenger Department, C.N. Steamships. Office, Birmingham, Eng.

C. R. SHEPHERD, District Passenger Agent, C.N. Steamships. Office, Bristol, Eng.

Canadian Pacific Ry.—H. C. GROUT, heretofore Superintendent, District 1, Ontario Division, Toronto, has been appointed Superintendent, District 1, Atlantic Division, vice C. W. Burpee, transferred to Toronto. Office, St. John, N.B.

D. L. JONES, heretofore District Master Mechanic, Districts 1 and 2, Atlantic Division, McAdam Jct., N.B., has been appointed acting Master Mechanic, Atlantic Division, during the absence on sick leave, of C. R. Ord. Office, McAdam Jct., N.B.

F. GRANT, heretofore District Master Mechanic, Brownville Jct., Me., has been appointed acting District Master Mechanic, Districts 1 and 2, Atlantic Division, vice D. L. Jones, promoted. Office, McAdam Jct., N.B.

LACEY R. JOHNSON, M. Can. Soc., C.E., heretofore Assistant Superintendent of Motive Power, Angus Shops, has been appointed General Superintendent, Angus Shops District. Office, Montreal.

He will have general charge of the company's property within the Angus shops district, including the construction of new buildings, and the maintenance of those already constructed, the force engaged in the maintenance of tracks and buildings, yard gangs, and engine men, police force and fire protection. He will also have direct charge of the operation of the power and heating plants, and the maintenance of power and heating lines throughout all premises. He will have charge of apprentice instruction, St. John Ambulance Association work, and such matters as may from time to time be assigned to him.

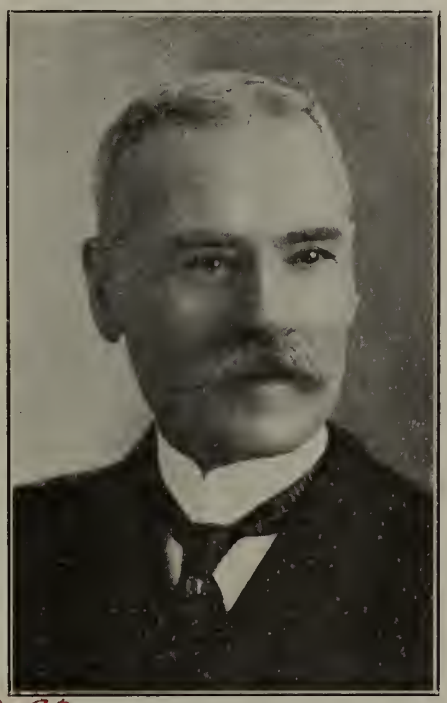
H. OSBORNE, heretofore Superintendent, Locomotive Department, Angus Shops, Montreal, has been appointed Assistant Superintendent of Motive Power, vice L. R. Johnson, transferred to other duties. Office, Montreal.

G. E. HALL, Assistant General Storekeeper, Eastern Lines, Montreal, is carrying out the duties of General Storekeeper, pending the appointment of a successor to the late J. H. Callaghan.

C. W. BURPEE, heretofore Superintendent, District 1, Atlantic Division, St. John, N.B., has been appointed Superintendent, District 1, Ontario Division, vice H. C. Grout, transferred to St. John. Office, Toronto.

R. B. RIPLEY, heretofore Engineer in charge of bridge repairs and standardization of grade, Dominion Atlantic Ry., Kentville, N.S., has been appointed Assistant Engineer in charge of grade separation, C.P.R., North Toronto, Ont.

H. B. STEVENS, heretofore Chief Dispatcher, White River, Ont., has been appointed Chief Dispatcher, District 1, Lake



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Lacey R. Johnson, M. Can. Soc. C.E., General Superintendent, Angus Shops District, Canadian Pacific Railway.

Superior Division, vice R. T. Moran, transferred. Office, Sudbury, Ont.

T. J. ARMSTRONG, heretofore Roadmaster, Webbwood subdivision, Lake Superior Division, has been appointed Roadmaster, Sudbury subdivision, Lake Superior Division, vice L. B. Copeland, transferred. Office, Sudbury, Ont.

R. SHANKS, Roadmaster, Algoma subdivision, Lake Superior Division, Sault Ste. Marie, Ont., has had his territory extended to include the Webbwood subdivision, T. J. Armstrong having been transferred to the Sudbury subdivision. Office, Sudbury, Ont.

J. H. BOYLE, heretofore Assistant Superintendent, District 4, Eastern Division, Ottawa, has been appointed Superintendent, District 3, Lake Superior Division, vice J. H. Hughes. Office, Schreiber, Ont.

N. E. BROOKS, Division Engineer, Calgary, Alta., has been appointed acting General Superintendent, Alberta Division, during the absence on leave of A. Price. Office, Calgary.

J. ROBERTSON, heretofore Resident Engineer, Cranbrook, B.C., has been appointed Resident Engineer, Calgary, Alta,. vice T. J. Brown, transferred.

W. H. GORDON, heretofore Bridge and Building Master, Medicine Hat, Alta., has been appointed Trainmaster, Red Deer, Alta. This is a new position.

N. E. BROOKS, Division Engineer, Calgary, has been appointed acting General Superintendent, Alberta Division, relieving A. Price, who is on leave of absence.

T. J. BROWN, heretofore Resident Engineer, Calgary, Alta., has been appointed Resident Engineer, Cranbrook, B.C., vice J. Robertson, transferred.

W. E. HAYWARD has been appointed Locomotive Foreman at North Bend, B. C., vice G. H. Tedlock, resigned.

Dominion Atlantic Ry.—G. G. HARE, heretofore Engineer, Kingston and Pembroke Ry., Kingston, Ont., has been appointed Engineer of Bridges, D.A.R. Office, Kentville, N.S.

Esquimalt and Nanaimo Ry.—H. E. BEASLEY, heretofore Superintendent, has been appointed General Superintendent. Office, Victoria, B.C.

J. GOODFELLOW, heretofore Assistant Superintendent, has been appointed Superintendent, vice H. E. Beasley, promoted. Office, Victoria, B.C.

M. S. WHEATLEY, heretofore Mechanical Foreman, has been appointed Master Mechanic. Office, Wellington, B.C.

Fort Garry Union Station, Winnipeg.—E. LAIT, has been appointed General Yardmaster, Winnipeg Joint Terminals, vice G. A. Templeman, resigned to reenter Canadian Northern Ry. service.

JAS. MOORE has been appointed Car Foreman, Winnipeg Joint Terminals, in charge of car inspectors or other Car Department forces.

W. LAMPORT has been appointed Assistant Yardmaster, Winnipeg Joint Terminals, in charge of engineers and firemen, and such other duties as may be assigned to him by the General Yardmaster.

JAMES TODD has been appointed station master, Winnipeg Joint Terminals, vice J. M. Bannerman, resigned.

Grand Trunk Pacific Ry.—J. P. KIRKPATRICK, heretofore Trainmaster, Districts 31 and 32, Ottawa Division, G.T.R., Ottawa, has been appointed Superintendent, G.T.P.R., with jurisdiction over the Melville-Regina, Regina-Boundary and Regina-Moose Jaw lines, vice W. B. Cronk, resigned. Office, Regina, Sask.

The following agents have been appointed:—Manaki, Ont., J. A. Foran; Waldron, Sask., B. Simmons; Yorkton, Sask., C. W. Hemsworth; Lestock, Sask., S. E. Hurley; Bradwell, Sask., H. G. House; Leney, Sask., T. W. Fleming; Stoney Plain, Alta., N. F. Gale.

Grand Trunk Ry.—E. S. COOPER, heretofore Chief Dispatcher, Districts 4 and 5, Eastern Division, Montreal, has been appointed acting Trainmaster, Districts 1 and 2, Eastern Division, vice J. W. Farrell, granted extended leave of absence on account of ill health. Office, Island Pond, Vt.

J. H. JOHNSTON, heretofore Master of Bridges and Buildings, Ottawa Division, Ottawa, has been appointed Master of Bridges and Buildings, Eastern Division, vice A. Findley, retired on pension after 46 years service. Office, Montreal.

O. MASSE, heretofore Night Chief Dispatcher, has been appointed acting Chief Dispatcher, Districts 4 and 5, Eastern Division, vice E. S. Cooper, promoted. Office, Montreal.

F. B. NIXON has been appointed acting night Chief Dispatcher, Districts 4 and 5, Eastern Division, Montreal, vice O. Masse, promoted.

J. CHISHOLM has been appointed Master of Bridges and Buildings, Ottawa Division, vice J. H. Johnston, transferred. Office, Ottawa.

J. S. McADAM, heretofore Chief Dispatcher, Ottawa Division, Ottawa, has

been appointed Trainmaster, Districts 31 and 32, Ottawa Division, vice J. P. Kirkpatrick, transferred to G.T.P.R. service. Office, Ottawa.

H. C. WHITE, heretofore dispatcher, has been appointed Chief Dispatcher, Ottawa Division, vice J. S. McAdam, promoted. Office, Ottawa.

G. A. HARRISON, heretofore telegraph operator, is reported to have been appointed Travelling Passenger Agent for Thousands Islands, vice E. A. Dornan, deceased. Office, Gananoque, Ont.

G. GORDON, heretofore Car Distributor, Toronto Terminals, has been appointed Passenger Yardmaster, Toronto Union Station.

JOHN BOYD has been appointed Weighing Inspector, Toronto, vice J. H. Telfer, retired after 46 years continuous service with the company.

The following agents have been appointed:— St. Laurent, Que., H. Valade; Brockville, Ont. (pass.), W. E. Allan, acting; Winona, Ont., W. E. Cusson; Sarnia, Ont., (freight), and Point Edward, Ont., G. Dench; Sebringville, Ont., J. W. Manning; Greenfield, Ont., J. Shane; Kinbrun, Ont., W. Hardy; Barrys Bay, Ont., G. A. Thurston; Ravenworth, Ont., N. G. Reynolds.

Great Northern Ry.—L. C. GILMAN, Assistant to the President, has had his office moved from St. Paul, Minn., to Seattle, Wash.

A. WHITNALL has been appointed City Passenger Agent, Vancouver, B.C.

Kingston and Pembroke Ry.—J. A. IRVINE, heretofore in the Construction Department, C.P.R., Montreal, has been appointed Engineer, K & P. Ry., vice G. G. Hare, who has entered Dominion Atlantic Ry. service. Office, Kingston, Ont.

Michigan Central Rd.—B. F. AIKENS has been appointed Purchasing Agent, vice J. F. Farrell, resigned to enter other service. Office, Detroit, Mich.

Northern Pacific Ry.—W. P. CLOUGH, director and member of the executive committee, has been appointed Vice President, vice J. N. Hill, resigned on account of ill health. Office, New York.

Prince Edward Island Ry.—G. A. HUGHES, heretofore train dispatcher, has been appointed Chief Dispatcher. Office, Charlottetown, P.E.I.

Rutland Rd.—F. T. GRANT, heretofore Assistant General Passenger Agent, Boston and Maine Rd., Boston, Mass., has been appointed General Passenger Agent, Rutland Rd., Rutland, Vt., vice C. HARTIGAN, appointed Assistant General Passenger Agent, Lake Shore and Michigan Southern Ry., Chicago, Ill.

Toronto, Hamilton and Buffalo Ry.—F. F. BACKUS, heretofore General Freight and Passenger Agent, has been appointed Traffic Manager. Office, Hamilton, Ont.

J. C. MARTIN, heretofore Assistant General Freight and Passenger Agent, has been appointed General Freight and Passenger Agent.

Canadian Freight Association, Eastern Lines.

At the midsummer meeting of this association, Eastern Lines, at Bluff Point, N.Y., July 10 to 12, the resignation of T. Marshall, Chairman, on his appointment as Manager of the Traffic Department of the Toronto Board of Trade was accepted.

W. R. MacInnes, Freight Traffic Manager, C.P.R., Montreal, on behalf of the association, presented him with a silver tea service as a token of esteem and in appreciation of his services to the association as secretary and chairman.

A. E. Rosevear, Assistant General Freight Agent, G.T.R., Montreal, has been appointed acting chairman, Canadian Freight Association, Eastern Lines, pending the appointment of a successor to Mr. Marshall.

Railway Rolling Stock Notes.

The Intercolonial Ry. has received one postal car from the Nova Scotia Car Works, Halifax.

The G.T.Pacific Ry. has received 73 ballast cars, nos. 392747 to 392819, from the Canadian Car and Foundry Co., Montreal, and 41 flat cars, nos. 361601 to 361641, from the American Car and Foundry Co.

The Canadian Northern Ry. has ordered four Pacific type superheater passenger locomotives, from the Montreal Locomotive Works. They will have cylinders 23 ins. diar., by 28 ins., stroke, driving wheels 69 ins. diar., and will be of a total weight in working order, of 213,000 lbs.

The C.P.R., between June 17 and July 17, ordered the following rolling stock:— five freight refrigerator cars, nine stock cars, nine vans, two wooden flat cars, and one G1 locomotive, from its Angus shops, Montreal; 11 snow ploughs, from the Canadian Car and Foundry Co., Montreal; 1,000 steel frame box cars, from the American Car and Foundry Co.; 25 ten wheel locomotives from the Montreal Locomotive Works, and 25 ten wheel locomotives from the American Locomotive Co., Schenectady, N.Y.

The Canadian Northern Ry., between June 15 and July 15, received the following additions to rolling stock:— two consolidation locomotives, from the Canadian Locomotive Co., Kingston, Ont.; two consolidation locomotives, from the Canada Foundry Co., Toronto; two first class cars, six second class cars, one dining car and 250 box cars, from the Canadian Car and Foundry Co., Montreal; three baggage cars and 150 box cars, from the Crossen Car Co., Cobourg, Ont.; 100 box cars, from the Nova Scotia Car Works, Halifax, N.S., and 47 flat cars from the Rathbun Co.

The C.P.R., between June 17 and July 17, received the following additions to rolling stock:— 100 freight refrigerator cars, 221 stock cars, 42 vans, 62 wooden box cars, one pile driver, five suburban cars, one first class car, eight first class and smoking cars, five dining cars, six sleeping cars, three cafe-parlor cars, and 12 switching locomotives, type U3, from its Angus shops, Montreal; 22 steel frame box cars, 30 ballast cars, 239 coal cars, and 107 flat cars, from the Canadian Car and Foundry Co., Montreal; 67 stone cars from the Nova Scotia Car Works, Halifax; three Rodger ballast ploughs from F. H. Hopkins and Co., Montreal; 19 D10 locomotives, from the Montreal Locomotive Works, and one wrecking crane from the U.S.

Following are chief details of the four ten wheel locomotives, which the Canadian Northern Ry. is having built by the American Locomotive Co., Schenectady, N.Y.:—

Weight on drivers, in working order	149,000 lbs.
Weight of engine total	198,500 lbs.
Weight of tender, in working order	134,000 lbs.
Cylinders, diar and stroke	21 by 28 ins.
Valve gear, type	Walschaert
Driving wheels, diar.	63 ins.
Wheel base, driving	14 ft. 10 ins.
Wheel base, total engine	26 ft. 1 in.
Wheel base, engine and tender	55 ft. 0¾ in.
Boiler, type	Wagon top
Boiler, pressure	200 lbs.
Boiler, tubes, no. and diar.	239—2 ins.
Boiler, flues, no. and diar.	24—5 ins.
Heating surface, firebox	180 sq. ft.
Heating surface, tubes	2229 sq. ft.
Heating surface, total	2409 sq. ft.
Superheating surface	408 sq. ft.
Grate area	49 sq. ft.
Capacity, water	5000 imp. gals.
Capacity, coal	12 tons
Superheater	Vaughan-Horsey

Following are the chief details of the 41 Pacific type locomotives, equipped with superheaters of top header double loop type and sectional brick arch, which the G.T.R. is having built by the Montreal Locomotive Works, as mentioned in our last issue:—

Cylinders, diar. and stroke	23 by 28 ins.
Driving wheels, diar. and stroke	for 31—69 ins. for 10—73 ins.
Boiler, outside diar., first course	70½ ins.
Firebox, length and width	86⅞ by 75¼ ins.
Tubes, no. and diar.	181—2 ins.
Flues, no. and diar.	24—5⅜ ins.
Tubes and flues, length	20 ft. 7 ins.
Grate area	50.6 sq. ft.
Wheel base, driving	13 ft. 4 ins.
Wheel base, engine	33 ft. 2 ins.
Wheel base, engine and tender	62 ft. 3½ ins.
Weight on leading truck	40,000 lbs.
Weight on drivers	145,000 lbs.
Weight on trailing truck	38,000 lbs.
Weight, total engine	223,000 lbs.
Weight of tender	144,600 lbs.
Capacity, water	8,000 U.S. gals.
Capacity, coal	10 tons.

Following are chief details of the four ten wheel locomotives, which the Canadian Northern Ry. is having built by the Montreal Locomotive Works:—

Weight on drivers	112,500 lbs.
Weight on truck	41,500 lbs.
Weight of engine, total	154,000 lbs.
Weight of tender	123,400 lbs.
Wheel base, driving	13 ft. 6 ins.
Wheel base, total engine	23 ft. 10 ins.
Wheel base, engine and tender	52 ft. 8 ins.
Tractive power, maximum	24,300 lbs.
Factor of adhesion	4.63
Cylinders, diar. and stroke	20 by 24 ins.
Valves, type and gear	Walschaert
Valves, diar. and travel	12 and 5½ ins.
Driving wheels, diar.	57 ins.
Driving journals	8½ by 10 ins.
Truck, type	Four wheel with swing bolster
Truck journals	5½ by 10 ins.
Truck wheels	30 ins.
Boiler, type	Extended wagon top, radial stay
Boiler, outside diar. front end	58¼ ins.
Boiler, outside diar. largest course	65 ins.
Boiler, height over crown, front	27½ ins.
Boiler pressure	170 lbs.
Firebox, length and width	102⅞ by 41¼ ins.
Tubes, no. and diar.	133—2 ins.
Tubes, length	13 ft. 2¼ ins.
Flues, no. and diar.	18—5⅜ ins.
Heating surface, tubes	1241 sq. ft.
Heating surface, firebox	141 sq. ft.
Heating surface, total	1382 sq. ft.
Superheating surface	279.6 sq. ft.
Grate area	29.2 sq. ft.
Tender wheels, diar.	33 ins.
Tender journals	5½ by 10 ins.
Tender wheel base	17 ft. 10 ins.
Tender truck, type	Four wheel pedestal
Tank, type	Water bottom
Capacity, water	5,000 imp. gals.
Capacity, coal	10 tons

J. W. Jordan, Yardmaster, C.P.R., Winnipeg, is being charged with theft from C.P.R. warehouses and cars.

The Great Western Ry. of England has been conducting a series of tests of an electric automatic train control and cab signalling system. On July 5, a test was made over a prepared track, two locomotives being started toward each other, the drivers leaving the cabs before a high speed had been attained. When the locomotives came on the same block, the warning whistles blew, steam was automatically shut off, brakes applied, and they came to a stop, without collision.

NOTICE TO CONTRACTORS.

Tenders will be received by the undersigned for the construction of that portion of the Canadian Northern Pacific Railway on Vancouver Island, known as Division D, extending from Mileage 100, west of Cowichan Lake, to a point on the Alberni canal, a distance of approximately forty miles.

Tenders to include clearing, grubbing, grading, bridges, trestles, culverts, masonry and fencing.

Plans, profiles, specifications and forms of contract may be seen and forms of tender obtained at the offices of Mackenzie, Mann and Co., Ltd., Pemberton Block, Victoria, B.C.

Total work to be completed within one year from the date of the signing of the contract.

Tenders to be received at the offices of Mackenzie, Mann and Co., Ltd., Room No. 713, Metropolitan Building, 837 Hastings Street West, Vancouver, B.C., not later than 12-0 noon on the 10th day of August, 1912, and to be enclosed in sealed envelopes marked "Tender for Construction."

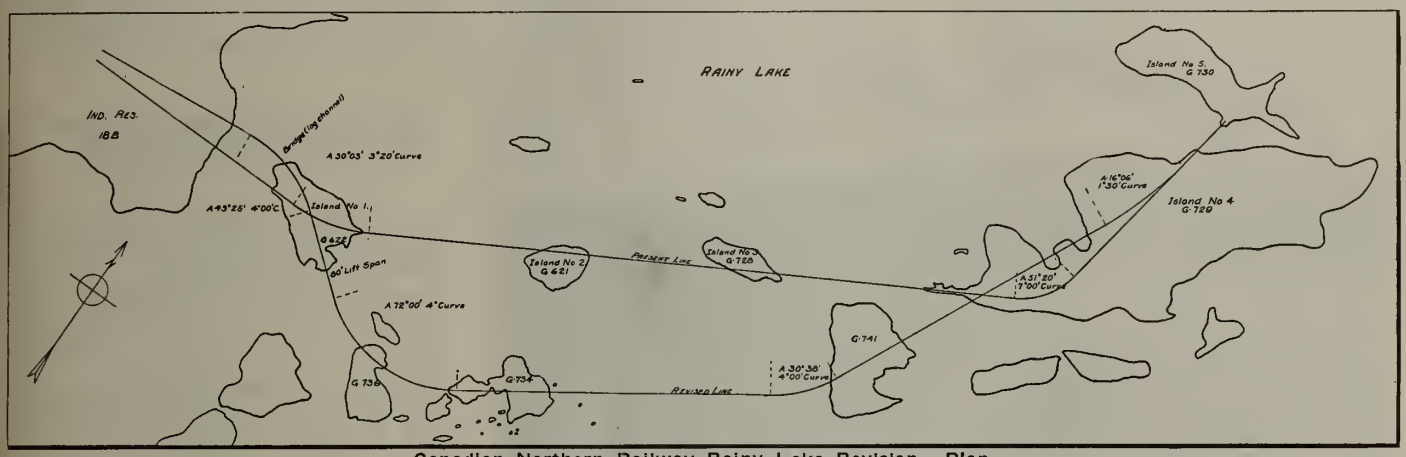
The lowest or any tender not necessarily accepted.

MACKENZIE, MANN & CO., LTD.

Canadian Northern Railway Revision at Rainy Lake. Ont.

By W. L. Mackenzie M. Can. Soc. C.E., Bridge Engineer, C.N.R.

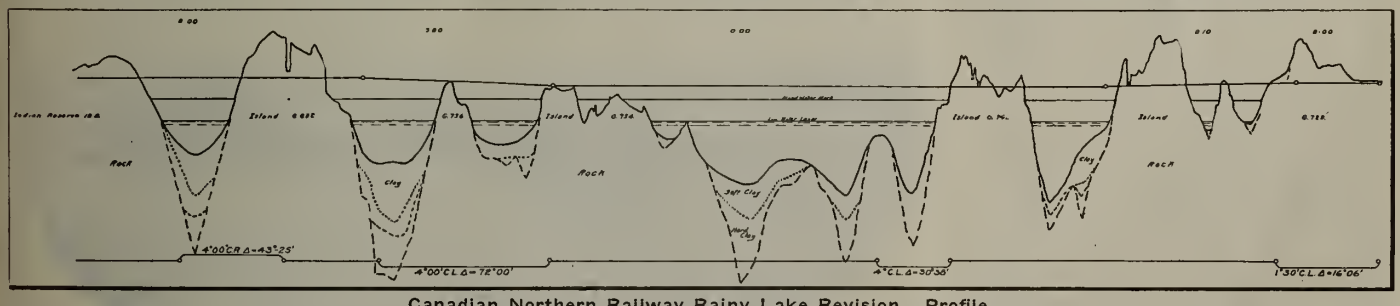
The C.N.R. main line from Port Arthur to Winnipeg crosses Rainy Lake at the Narrows near Fort Frances, Ont., on a pile trestle upwards of two miles long. The present structure was completed in 1900, and has served to carry the large traffic up to the present. In constructing the trestle it was necessary to use piles as long as 80 ft., as the lake bottom was rather soft clay. Very little difficulty has been experienced in maintaining the pile trestle, but it was necessary to take continual precautions to guard against trouble. When the lake froze over in the fall, the water was usually higher than later on in the winter, and as the water gradually fell it was necessary to keep the ice cut away from the piles to avoid settlement from the weight of ice. In the spring there was always the possibility of a strong north wind driving the ice against the trestle. However, the latter caused little trouble and any slight damage from this cause was immediately repaired. The increase in traffic during the last few years made it apparent that the trestle must soon be replaced. It was not possible to make an embankment on the present line and keep the line open for traffic at the same time, besides the depth to rock on the present line was such that the embankment quantities would have been excessive.



Canadian Northern Railway Rainy Lake Revision. Plan.

In order to choose a new location it was necessary to take soundings to rock over a large area adjacent to the present line. This work was started during the winter with only fair success, owing to the difficulty experienced in handling the sounding rods, as they became quickly coated with ice. The work was continued during the summer, using a barge 22 ft. wide by 34 ft. long, on which was erected a small pile driver with a 75 lb. hammer operated by hand. The sounding was done through a well in the centre of the scow, using extra heavy 1¼ in. steel pipe in 10 ft. lengths for sounding rods. This proved much more satisfactory than winter work, as many as 28 soundings to rock bottom being secured in one day. Many of the soundings taken extended to 90 ft. below the surface of the water, the water sometimes being 40 ft. deep, with 50 ft. of clay underneath. The clay varied from a soft ooze to a compact clay in which the sounding rod would only penetrate an eighth of an inch with a 4 ft. drop of the hammer.

Following the taking of the soundings, a contour map of the lake bottom was made and a location for the new line was selected, giving much smaller quantities of fill as compared with any other line. The new line is 15,814 ft. long. 800,000 cu. yds. rock are required for a double track embankment, about 95% of this being obtained from an adjacent island. Contractors are using drills operated by compressed air, the power being obtained from the hydro-electric development recently completed at Fort Frances. Steam shovels are employed for loading the rock into cars, and switching locomotives are used between the borrow pit and fill. The contractor has devised an unusual arrangement for building the fills. To obviate the necessity for a trestle, he placed two plate girders 140 ft. long across a supporting barge 32 ft. by 112 ft. by 6 ft. deep, the inner end of these girders being supported by a cross girder 80 ft. long, the ends of the cross girder being in turn supported by two smaller barges 12 ft. by 24 ft. by 5 ft. deep. The two long girders are spaced 30 ft. c. to c.. and are connected by floor beams on which track stringers are placed to carry cars as they came from the borrow pit. The cars are dumped in the space between the barges, the outer end of the long girders serving as a tail track for empties.



Canadian Northern Railway Rainy Lake Revision. Profile.

This arrangement has proved entirely satisfactory, and the work has progressed without interruption, the embankment being now about 75% completed.

On making comparison between excavation and embankment quantities it is found that the embankment is almost entirely displacing the clay in the bed of the lake.

The accompanying plan shows the relative positions of the present and revised lines. The profile illustrates the hugeness of the work. The illustrations from photographs on pg. 408, show the barges and girders in use.

Approximate Quantities for Timber Bridges on the Canadian Northern Railway.

By A. J. Taunton.

These figures refer to bridges on the C.N.R., and must be modified to suit other structures. For pile trestles the piles may be estimated directly from the profile, the deck and caps running at about 2,700 f.b.m. per opening of 14 ft. 9 in., and a small allowance for dump plank and bracing depending on the height being made. Allow for lengths of pile in ordinary soil 15 ft. more than the height from the ground to cut-off. The iron will be about 60 lbs. per m. The piling on frame trestles is also obtained from the profile. The f.b.m. timber may be approximately obtained by multiplying the area of the opening between end bents, the ground, and the base of rail by a factor K, the value of which may vary from 11 to 13½. For long low trestles K may be as high as 13½, and for short deep ones the low limit (11) will be reached. The ratios of the area of the toe slopes at the ends to the whole area, and the timber in the deck to the total quantity, will considerably influence the value of K. Good guessing on the part of the estimator is necessary; this, combined with experience and judgment, should give very fair approximate results. The iron will be 57 to 60 lbs. per m.

The following figures are for Howe trusses, exclusive of falsework:

Span in feet.	Equivalent D.G.S. Loading.	f.b.m. Timber.	lbs. Iron.
60	Class III.	33,000	13,000
60	" Heavy	42,000	28.000
80	" III.	56,000	40.000
120	" II.	——	58,000

From the Transactions of the Engineering Society, Manitoba University, in The Manitoba Engineer.

The Ottawa Car Co. is going to build a new and larger plant at Britannia, a suburb of Ottawa.

Birthdays of Transportation Men in August.

Many happy returns of the day to:—

W. E. Bishop, General Agent, Niagara Navigation Co., Hamilton, Ont., born at Brantford, Ont., Aug. 10, 1868.

J. F. Chapman, Manager, Thousand Islands Ry., and Oshawa Ry., Gananoque, Ont., born at Frankford, Hastings Co., Ont., Aug. 25, 1863.

A. E. H. Chesley, General Accountant, Dominion Atlantic Ry., Kentville, N.S., born near Annapolis Royal, N.S., Aug. 27, 1877.

C. H. N. Connell, Engineer Maintenance of Way, Canadian Northern Quebec and Quebec and Lake St. John Rys., Quebec, born at Woodstock, N.B., Aug. 26, 1876.

Canadian Northern Railway Rainy Lake Revision. Main Borrow Pit.

F. Barlow Cumberland, ex-Vice President, Niagara Navigation Co., Port Hope, Ont., born at Portsmouth, Eng., Aug. 5, 1846.

E. L. Desjardins, Assistant Superintendent, Montreal and Ste. Flavie District, Intercolonial Ry., Riviere du Loup, Que., born at St. Jean Port Joli, Que., Aug. 1, 1859.

F. L. Ellingwood, Superintendent Building Construction, C.P.R., Montreal, born at Eastport, Me., Aug. 6, 1863.

G. H. Ham, head office staff, C.P.R., Montreal, born at Trenton, Ont., Aug. 23, 1847.

W. P. Hinton, General Passenger Agent, G.T.P.R., Winnipeg, born at Hintonburg, Ont., Aug. 30, 1871.

R. Kerr, ex-Passenger Traffic Manager, C.P.R., born at Toronto, Aug., 1845.

J. D. McDonald, Assistant Passenger Agent, G.T.R., Chicago, Ill., born at Toronto, Aug. 27, 1855.

T. McHattie, Master Mechanic, Eastern Division, G.T.R., Montreal, born at Dufftown, Banffshire, Scotland, Aug. 8, 1854.

M. K. McQuarrie, Resident Engineer, District 1, British Columbia Division, C.P.R., Revelstoke, born at Sault Ste. Marie, Ont., Aug. 17, 1884.

J. A. Marsh, Trainmaster, British Columbia Electric Ry., New Westminster, B.C., born at Dresden, Ont., Aug. 16, 1876.

W. J. Meakin, Locomotive Foreman, C.P.R., Castor, Alta., born at Toronto, Aug. 22, 1869.

C. Montgomery, Master Mechanic, Pere Marquette Rd., St. Thomas, Ont., born near London, Ont., Aug. 29, 1860.

W. E. Mullins, General Manager, Costa Rica Division, United Fruit Co, San Jose, Costa Rica, born at Stratford, Ont., Aug. 13, 1870.

F. H. Phippen, K.C., General Counsel, C.N.R., Toronto, born at Belleville, Ont., Aug. 26, 1862.

W. M. Porteous, Freight Agent, C.P.R., St. Louis, Mo., born at Edinburgh, Scotland, Aug. 3, 1857.

J. F. Richardson, Superintendent Telegraphs, British Columbia Division C.P.R., Vancouver, born at Granby, Que., Aug. 23, 1861.

W. G. Ross, President, Quebec Railway, Light and Power Co., born at Montreal, Aug. 6, 1873.

W. Le B. Ross, Local Treasurer, G.T. Pacific Ry., Winnipeg, born at Ottawa, Ont., Aug. 9, 1868.

Major Salt, Car Foreman, C.P.R., Toronto, born at Lichfield, Eng., Aug. 12, 1859.

F. C. Salter, European Traffic Manager, G.T.R., and Canadian Ex. Co., London, Eng., born at Sarnia, Ont., Aug. 31, 1863.

W. H. Sample, Master Mechanic, Ottawa Division, G.T.R., Ottawa, born at Altona, N.Y., Aug. 2, 1864.

C. R. Scoles, General Manager, Quebec Oriental Ry., New Carlisle, Que., born at Grantham, Lincoln, Eng., Aug. 27, 1856.

S. A. Simpson, Superintendent, Sleeping, Dining and Parlor Cars and News Service, Saskatchewan Division, C.P.R., Moose Jaw, born at Toronto, Aug. 22, 1880.

W. Stitt, General Passenger Agent, C.P.R., Eastern Lines, Montreal, born in Kirkcudbrightshire, Scotland, Aug. 3, 1855.

J. F. Sweeting, Industrial Agent, Natural Resources Department, C.P.R., Calgary, Alta., born at Worthing, Eng., Aug. 20, 1872.

W. F. Taylor General Storekeeper, Intercolonial Ry., Moncton, N.B., born at Hillsboro, N.B., Aug. 20, 1855.

R. L. Thompson, ex-District Passenger Agent, C.P.R., Toronto, born at Montreal, Aug. 17, 1873.

F. J. Thomson, Marine Superintendent, Canadian Northern Steamships, Ltd., Montreal, born in Cheshire, Eng., Aug. 20, 1876.

F. E. Warren, Division Car Foreman, Ontario Division, C.P.R., West Toronto, Ont., born at Chelsea, Que., Aug. 29, 1872.

W. B. Way, Assistant Superintendent District 3, Eastern Division, C.P.R., Montreal, born at Bowmanville, Ont., Aug. 22, 1867.

E. H. Williams, Locomotive Foreman, Canadian Northern Ry., Brandon, Man., born at West Toronto, Ont., Aug. 26, 1844.

Approval of Route Maps of Railways Under Dominion Jurisdiction

The following route maps have been approved by the Minister of Railways. The date of approval is June 26, except where otherwise stated:—

ALBERTA CENTRAL RY.—Revision from mileage 140 to Yellowhead Pass, 165 miles.

ALBERTA INTERURBAN RY.—Revisions, about 18 miles.

CANADIAN NORTHERN ONTARIO RY.—Through Lincoln and Welland counties, about 30 miles.

From North Toronto, eastward, 7.2 miles.

CANADIAN NORTHERN RY.—Revision from Calgary, Alta., southerly and westerly, about 12 miles.

CANADIAN PACIFIC RY.—From Laggan to Lake Louise, Alta., 3.55 miles. (June 18).

From Estevan, Sask., westerly, 96.5 miles.

Revision of Touchwood Hills branch, 48.8 miles.

From Sedgewick southerly, 23.6 miles.

GRAND TRUNK PACIFIC RY.—Revisions between Calgary and Coutts, Alta., about 45 miles.

Canadian Northern Railway Rainy Lake Revision, Barges and Girders in use.

Revision of Cutknife branch, about 11 miles.

MONTREAL AND SOUTHERN COUNTIES RY. (Electric).—From Ranelagh station to Laprairie, Que., about 12 miles.

NIAGARA, ST. CATHARINES AND TORONTO RY. (Electric).—From St. Catharines to Niagara-on-the-Lake, Ont., about 14 miles.

From Port Dalhousie to Beamsville, Ont., 12 miles.

NIPISSING CENTRAL RY. (Electric).—From Haileybury to New Liskeard, Ont., about 5½ miles.

Orders by the Board of Railway Commissioners.

Beginning with June, 1904, we have published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed our paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates given of orders, immediately following the numbers are those on which the hearings took place, and not those on which the orders were issued. In many cases orders are not issued for a considerable time after the dates assigned to them.

16544. May 15.—Approving location of Windsor, Essex and Lake Shore Rapid Ry., siding, freight shed and station at Essex, Ont.

16545, 16546. May 18.—Authorizing G.T.R. to build siding for Bechtels, Ltd., near Waterloo, and St. Lawrence Starch Co., Port Credit, Ont.

16547. May 20.—Authorizing C.P.R. to build spur for Ontario Rock Co., Belmont tp., Ont.

16799, 16800. June 19, 17.—Approving C.N. Ontario Ry. revised location through Badgerow and Field tps., Nipissing district, mileage 374.58 to 378.96 and through Field, Badgerow and Gibbons tps, mileage 260.47 to 265.92 from Ottawa.

16801. June 17.—Ordering C.P.R. to build farm crossing in Salaberry tp., Que.

16802. June 19.—Authorizing C.P.R. to use interchange track with G.T.R. at Goderich, Ont., as directed by order 15777, Jan. 8.

16803. June 18.—Further extending to Sept. 30, time for instalation by Hull Electric Co., of power brakes on its electric cars required by order 10462. May 3, 1910.

16804. June 17.—Approving proposed change in C.P.R. station at Meath, Ont.

16805. June 18.—Extending to July 15, time for installation by C.P.R. of crossing signs and fences between Swift Current and Neville, Sask., ordered by order 15865, Feb. 1.

16806. June 19.—Approving location of C.P.R. branch from near Laggan station to near its hotel at Lake Louise, B.C.

16807. June 19.—Authorizing G.T. Pacific Ry. to build spur for Great Northern Tannery Co., Edmonton, Alta.

16808. June 19.—Amending order 16589, May 20. re G.T. Pacific Ry. location through Fort William, Ont.

16809. June 19.—Ordering that crossing of G.T. Pacific Ry. by C.P.R. at the dock at Vancouver, B.C., be protected by gates, watchman to be appointed by C.P.R. and paid by the G.T.P.R.

16810. June 18.—Further extending to Sept. 30. time for completion of overhead bridge by G.T.R. at Rockfield, Que.

16811. June 17.—Ordering that G.T.R. crossing at Bronson Ave., Ottawa, be protected by overhead structure, 20% to be paid from railway grade crossing fund. half remainder by city and half by G.T.R.

16812. June 19.—Approving plan and chart of interlocking plant to be installed by G.T.R. at bridges over St. Lawrence river and Soulanges canal.

16813. June 22.—Amending order 16695. June 7, re approval of portion of Campbellford, Lake Ontario and Western Ry. (C.P.R.) revised location.

16814. June 6.—Ordering G.T.R. within three months to install two sets of gates at King St., and one set at Sherbrooke St., Peterboro, Ont., day and night watchmen to be employed.

16815. June 20.—Amending order 16668, June 1, re crossing at Burrard Inlet, B.C. by substituting Vancouver, Victoria and Eastern Ry. for Vancouver, Westminster and Yukon Ry.

16816. June 11.—Extending to July 15, time for completion of certain work by C.P.R. at King St. crossing, Walkerton, Ont.

16817. June 19.—Authorizing C.N. Ontario Ry. to cross with its Ottawa-Capreol line, Dufresne Road, Ferris tp., Ontario.

16818. June 22.—Authorizing Canadian Northern Ry. to cross public road with its Aisask Southeasterly line, Saskatchewan.

16819. June 19.—Approving C. N. Ontario Ry. revised location through unsurveyed territory in Algoma District, mileage 208.3 to 211.47 from Sudbury Jct.

16820. June 20.—Authorizing G.T.R. to extend passing track and re-align main line over county line road, Brant tp., Ont.

16821. April 12.—Relieving C.P.R. from erecting fences on certain portions of its Fort William, Ignace and Kenora subdivisions.

16822. June 24.—Authorizing G.T. Pacific Ry. to open for traffic its line between Hinton, mileage 978, and Fitzhugh, mileage 1028, A lta.; speed limited to 20 miles an hour.

16823. June 20.—Ordering that city of Montreal be subject to fine of $25 a day after June 24, that it is in default of commencing work re Park Ave. subway, required by order 16504, May 13, and $25 a day after Dec. 15 that is in default of completing same.

16824. June 20.—Extending pending sanction of Governor-in-council of agreements, time for operation of Midland Ry. trains over Canadian Northern Ry. to Winnipeg Terminals, as defined in order 16550, May 20.

16825. June 20.—Extending to Oct. 1, time for completion by C.N.R. of spur into Hudson Bay reserve, Edmonton, Alta.

16826. June 18.—Authorizing C.P.R. to build its Moosejaw northwesterly branch across 34 highways in Saskatchewan.

16827. June 22.—Authorizing C.P.R. to use bridge 69.3 on its Boundary subdivision, B.C.

16828. June 22.—Approving James Bay and Eastern Ry., (C.N.R.) revised location in Roberval tp., Que.

16829. June 20.—Authorizing British Yukon Ry. to open for traffic its branch line from milepost 160 to Pueblo Mine, 13 miles.

16830. June 21.—Approving Edmonton, Dunvegan and British Columbia Ry. revised location, mileage 4 to 14, Alberta.

16831. June 17.—Dismissing application of Publishers Press, Ltd., Montreal, re Bell telephone service.

16832. June 20.—Amending order 14738, Sept. 9, 1911 re C.P.R. subway at Saranac Rd., York tp., Ont., by substituting plan dated Feb. 17, 1912; 20% to be paid from railway grade crossing fund.

16833. June 24.—Approving location of portion of C.P.R. Moose Jaw Southwesterly branch from mileage 37.85 to 64.47, Sask., and authorizing crossing of 22 highways.

16834. June 21.—Authorizing C.P.R. to build four spurs across Symes and Gunns roads, Toronto.

16835. June 24.—Extending to Aug. 31, time for completion of C.P.R. spur for Hanson and VanWinkle Co., Toronto.

16836. June 24.—Relieving C.P.R. from erecting fences on its Lac du Bonnet subdivision.

16837. June 18.—Authorizing C.P.R. to take certain city lands in Toronto, in connection with enlargement of freight terminals, etc.

16838. June 20.—Authorizing railways to dispense with night watchman at C.N. Ontario Ry. and C.P.R. crossing near Ottawa.

16839. June 21—Authorizing C.P.R. to build extension to siding for Taylor Milling and Elevator Co., Lethbridge, Alta.

16840. June 21.—Authorizing C.P.R. to close highway near mileage 48, Edmonton branch, Alta.

16841. June 22.—Authorizing C.P.R. to build spur for Lethbridge Brewing and Malting Co., and Young Bros., at Macleod, Alta.

16842. June 25.—Approving C.P.R. plan of track elevation at North Toronto, Ont., plan of subway structures for Yonge St. and Avenue Rd. to be filed for approval.

16843. June 17.—Dismissing application of Quebec Rifle Association re C.N.R. stopping trains at Point aux Trembles Range, Montreal.

16844. June 20.—Authorizing C.N. Quebec Ry. to cross C.P.R. with its St. Eustache-St. Jerome line, near St. Augustine.

16845. June 20.—Rescinding order 6301, Feb. 15, 1909, re C.N. Quebec Ry. Montfort branch, in so far as it requires maintenance of agent at Montfort.

16846. June 25.—Approving plans showing track elevation of joint section of C.P.R. and C.N. Ontario Ry. from Summerhill Ave. to Dovercourt Rd., Toronto, except approaches to subways at Yonge St., and Avenue Rd., which must be level; Christie St. subway to be full width of street.

16847. June 19.—Amending order 16498, May 10, re location of G.T. Pacific Branch Lines Co.'s station at Bashaw, Alta.

16848. June 18.—Approving location of G.T. Pacific Branch Lines Co.'s station at Dodsland, Alta.

16849. June 21.—Authorizing G.T. Pacific Branch Lines Co. to build seven spurs in Regina, Sask.

16850, 16851. June 17, 22.—Defining express delivery and collection limits for Shawinigan Falls and Fraserville or Riviere du Loup, Que.

16852. June 24.—Authorizing Toronto, Hamilton and Buffalo Ry. to build spur for Barton Lumber and Supply Co., Hamilton, Ont.

16853. June 11.—Dismissing application of city of Ottawa for removal of G.T.R. tracks from Preston street.

16854. June 21.—Ordering G.T.R. within 90 days to install electric bell at Brock St., Uxbridge, Ont., 20% to be paid from railway grade crossing fund.

16855, 16856. June 21.—Ordering Michigan Central Rd. within 60 days to install electric bells at Hornby St. and East St., Springfield, Ont, 20% to be paid from railway grade crossing fund.

16857. June 11.—Authorizing G.T.R. to build spur for Export Lumber Co., crossing Preston St., Ottawa, Ont.

16858. June 24.—Defining express delivery and collection limits for Three Rivers, Que.

16859. June 24.—Approving G.T.R. plans for new station at Richmond, Que.,

16860. June 2.—Approving C.P.R. plan of employes' passageway from Arlington St. bridge, Winnipeg.

16861. June 25.—Authorizing Canadian Northern Ry. to cross with its Aisask Southeasterly line 20 highways in Saskatchewan.

16862. June 24.—Ordering C.P.R. from May 1 to Oct. 1, to stop its mail trains at Lesage, Que., on flag.

16863, 16864. June 25,24.—Authorizing C.P.R. to rebuild six bridges on its Manitoba, Ontario, Atlantic and Eastern Divisions.

16865. June 24.—Authorizing C.N. Ontario Ry. to cross Carp River, Fitzroy tp.

16866, 16867. June 25.—Authorizing C.P.R. to build bridges 104.9 Moose Jaw subdivision, and 0.55, Smiths Falls subdivision.

16868. June 25.—Authorizing Esquimalt and Naniamo Ry. to open for traffic its Cowichan Lake branch from junction with main line to Cowichan Lake, 18 2-3 miles.

16869. June 25.—Authorizing C.P.R. to open for traffic its Swift Current Northwesterly branch from mileage 33 to 34.8, Sask.

16870. June 25.—Approving location of Campbellford, Lake Ontario and Western Ry. (C.P.R.) from mileage 106.17 from Glen Tay to mileage 121 and rescinding order 16669 May 30, which approved from mileage 106.7 to 123.

16871. June 26.—Relieving C.P.R. from further protection of crossing at mileage 84½ near Plaisance station, Que.

16872. June 26.—Authorizing Georgian Bay and Seaboard Ry. (C.P.R.) to open for traffic its line from Coldwater, mileage 12 to Bethany, mileage 88.2.

16873, 16874. June 26.—Relieving C.P.R. from erecting fences on its Boundary, Nakusp and Slocan, Lardo, Okanagan, Shuswap, Mountain and Arrow Lake subdivisions, B.C.

16875. June 25.—Authorizing C.P.R. to build spur for Alberta Clay Products Co., at Dunmore, Alta.

16876, 16877. June 25.—Authorizing C.P.R. to build ballast pit spur across highway near Elcan, Alta., and its Pheasant Hills branch across highway at mileage 17.3, McAuley subdivision.

16878. June 25.—Relieving C.P.R. from further protecting crossing at mileage 90.5 from Schwitzer Jct., Man.

16879. June 26.—Approving location of C.P.R. station at North Transcona, Man.

16880. June 26.—Extending to July 31, time for installing derails by G.T.R. on Union Stock Yards branch, Toronto.

16881, 16882. June 26.—Authorizing G.T.R. to build spurs for Dominion Canners, Ltd., near Forest station, and for N. J. and W. G. Smart, near Collingwood, Ont.

16883. June 25.—Approving changes in G.T.R. side track and stockpen, Priceville, Que.

16884. June 26.—Authorizing G.T.R. to build spur for Benson and Bray, Midland, Ont.

16885. June 26.—Dismissing application of residents of Druid, Alta., to compel G.T. Pacific Ry. to erect station near C.P.R. station. Application may be made for transfer track.

16886. June 24.—Authorizing G.T. Pacific Ry. to cross highway at mileage 176.9 Casslar District, B.C.

16887. June 26.—Authorizing C.N. Ontario Ry. to cross public road at Cote St. Michel, Que.

16888, 16889, June 25, 26.—Approving revised location of C.N. Ontario Ry. industrial branch from Oshawa station to Oshawa, and authorizing it to cross side road in Mara tp.

16890. June 26.—Approving revised location of Toronto Eastern Ry. in Pickering tp., Ont.

16891. June 25.—Amending order 15727. Dec. 19, 1911, re G.T. Pacific Ry. station at Hazleton, B.C., reserving leave to company to apply for approval of site giving adequate facilities.

16892. June 27.—Amending order 16790, June 10, re change in C.P.R. tracks and alteration of bridges on Mountain, Aqueduct, and Guy Sts. Montreal, by substituting city of Montreal for Montreal Tramways Co., in line 8 of operative part.

16893. June 26.—Ordering Dominion Atlantic Ry to show cause within 10 days why it should not furnish adequate facilities for housing and repairing its engines and cars at Kentville, N.S., under penalty of $25 a day.

16894. June 26.—Authorizing county of Compton municipality, Que., to build highway crossing over Maine Central Rd.

16895. June 25.—Authorizing J. B. Damphouse, Stony Point, Ont., to build farm crossing over G.T.R.

16896. June 24.—Defining express delivery and collection limits for Montreal.

16897. June 26.—Approving revised location of G.T.R. track in Cobourg, Ont., on

lands of W. J. Crossen and J. G. Field's estate.

16898. June 27.—Authorizing C.P.R. to build spur for N.K. Fairbank, Co., Lasalle, Que.

16899. June 28.—Authorizing South Ontario Pacific Ry. (C.P.R.) to open for traffic its line from Guelph Jct., to Hamilton, mileage 0 to 16.3.

16900. June 27.—General order re matter of indicating changes in freight, passenger and express tariffs. This is given in full on another page.

16901. June 28.—Authorizing G.T.R. to build spur for Congregation of Grey Nuns, St. Laurent parish, Que.

16902. June 27.—Approving proposed change in G.T.R. siding track on Charles St., Berlin, Ont.

16903. June 27.—Authorizing G.T.R. to build spur for A. E. Rogerson, Toronto.

16904. June 26.—Authorizing C.N. Ontario Ry. to build across public road in Ross tp.

16905. June 28.—Approving Canadian Northern Branch Lines Co. location through tps. 30-34, r. 4, w. 2 m., Sask.

16906. June 28.—Approving revised location of Kettle Valley Ry. from station 0 to 53+07.6, west of Penticton, B.C.

16907. June 27.—Approving clearances of Canada Malting Co.'s grain unloading shed on C.P.R. and Great Northern Ry. at Winnipeg.

16908. June 26.—Authorizing Vancouver, Victoria and Eastern Ry. to build highway crossing for B.C. government at Ashnola siding, B.C.

16909. June 26.—Authorizing Esquimalt and Nanaimo Ry. to build highway crossing between 2nd and 3rd Sts., Duncans, B.C., at expense of city.

16910. June 28.—Authorizing city of Hamilton, Ont., to build subway under G.T.R. at Birch Ave., near Sherman Inlet.

16911, 16912, June 28.—Authorizing Campbellford, Lake Ontario and Western Ry., (C.P.R.) to cross eight highways between mileage 130.78 and 144.00. Hope tp., approving location from mileage 94 to 97 and authorizing it to take G.T.R. lands.

16913. June 27.—Authorizing Alberta Ry. and Irrigation Co., (C.P.R.) to cross 39 highways and approving location of Stirling branch from mileage 0 to 37.14, Alta.

16914. June 28.—Rescinding order 3049, May 2, 1907, re C.P.R. bridges over Assiniboine river, at St. James and Headlingly, Man.; bridges to be opened for navigation on four hours notice to District Superintendent.

16915. June 28.—Authorizing C.P.R. to use six bridges on its Sault subdivision and Timiskaming branch, Lake Superior Division.

16916. June 27.—Amending order 16686. June 7, re spur for F. H. Wiley, Winnipeg.

16917. June 28.—Authorizing C.P.R. to build spur for E. Steel, west Hawkesbury, tp., Ont.

16918. June 27.—Authorizing C.P.R. to open for traffic its second track from Moose Jaw mileage 0.6 to Caron, mileage 16.2, Sask.

16919. June 28.—Authorizing C.P.R. to build spur for Canada Lumber Co., Weston, Ont.

16920, 16921. June 26.—Authorizing Georgian Bay and Seaboard Ry. (C.P.R.) and G.T.R. to operate over crossing at mileage 50.5 from Port McNicoll; and G.B. & S.R. (C.P.R.), and James Bay Ry. (C.N.R.), over crossing at Brechin, Ont., on account of interlocker being completed.

16922. June 28.—Temporarily approving G. T. Pacific Ry. C.R.C. 10, Standard Freight Mileage Tariff to supersede C.R.C. 7.

16923. July 2.—Authorizing Algoma Central and Hudson Bay Ry. to open for traffic its line between mileage 85 and 93, north of Sault Ste. Marie, Ont.

16924. July 2.—Authorizing Canadian Copper Co., and Algoma Eastern Ry. to operate over crossing in McKim, tp., half-interlocker being completed.

16925. July 2.—Authorizing C.N. Pacific Ry. and C.P.R. to operate over crossing on C.P.R. Mission Branch, B.C., interlocker being completed.

16926. July 2.—Approving Canadian Northern Ry. location through tps. 24-22, r. 1, w. 5 m., and r. 29, w. 4 m., Alta., mileage 0 to 13.21.

16927. June 29.—Authorizing Campbellford, Lake Ontario and Western Ry., (C.P.R.), to cross four highways and divert highways between mileage 165.46 and 165.96, Ont.

16928. July 2.—Authorizing C.P.R. to build additional track across Queen St. Port Moody, B.C.

16929. July 2.—Authorizing C.P.R. to build its Moose Jaw southwesterly branch across highway at mileage 29.75.

16930. June 29.—Authorizing G.T. Pacific Ry. to build spur to Union Stock Yards, St. Boniface, Man., crossing of Canadian Northern Ry. to be protected by interlocker.

16931. July 5.—Extending to Aug. 1, time for putting into effect order 16479, May 10, re classification of gramaphones, etc.

16932. July 4.—Authorizing C.P.R. to open for traffic its Moosejaw Southwesterly branch, from mileage 27.4 to 35; trains limited to 15 miles an hour.

16933 to 16935. June 29.—Authorizing Edmonton, Dunvegan and British Columbia Ry. to cross five highways in Alberta; and approving its revised location through tp 55, r. 25, w. 4 m., and authorizing it to cross highway between secs. 33 and 34.

16936. June 28.—Ordering G.T.R. to instal improved type of electric bell at two crossings in Corinth, Ont., 20% to be paid from railway grade crossing fund.

16937. June 29.—Approving Kettle Valley Ry. location, from Penticton to Coldwater, B.C., (sec. A).

16938. July 6.—Approving Alberta Interburban Ry. location through sec. 13, tp. 24, r. 1, w. 5 m., mileage 1.25 to 2.28, Calgary, Alta.

16939. July 4.—Ordering that Vancouver, Fraser Valley and Southern Ry, (B.C.E.R.), be subject to penalty of $25 a day after July 10, it shall be in default of requirements of order 16225, Apr. 3, re filing tariffs.

16940, 16941. June 29, July 2.—Authorizing C.N. Ontario Ry. to cross two public roads in Westmeath tp.,

16942. June 29.—Amending order 16653, May 31, re building of subway under G.T.R. at Sherman Inlet, by City of Hamilton, Ont.

16943. June 27.—Approving changes in G.T.R. bridges over public road in Tay, tp., Ont.

16944, 16945. July 3.—Authorizing G.T.R. to build spurs for Meaford Brick Co., con 1, St. Vincent tp., Ont., and Alabastine Hardmortar Co., Toronto.

16946, 16947. July 5.—Approving G.T.R. plans for bridges 189 and 77 on its Northern and Ottawa Divisions; and three and two bridges on its 12th and 15th districts.

16948, 16949. June 29.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.), to build across two highways in Newcastle, and Hope tp., Ont.

16950, 16951, July 5, 4.—Authorizing C.P.R. to rebuild two bridges on its Wingham and Emerson subdivisions, and to build two bridges on Campbellford, Lake Ontario and Western Ry., mileage 180.57 and 0.91, Ont.

16952 to 16954. July 4., June 6,3.—Extending to July 31, time for completion of electric bells by C.P.R. at Coldwater Jct., Ont., as required by order 15950, Feb. 8; to Aug. 31 for building spur at Wolverton, Ont., required by order 16287, Apr. 11; and to Dec. 31, for completion of spur at Emerson, Man., required by order 13302, Mar. 23, 1911.

16955. May 31.—Relieving C.P.R. from erecting fences on portions of its Eastern and Lake Superior Divisions.

16956 to 16960. July 5.—Authorizing C.P.R. to build spurs for Canada Cement Co., under lease to Revelstoke Saw Mill Co., Calgary Jct. Alta.; O. Lemire, St. Henri de Mascouche parish, Que.; G. Piggott & Co., York tp. Ont.; Ogilvie Flour Mills Co., Medicine Hat, Alta., and G. P. Sherwood & Co., Montreal.

16961. July 4.—Authorizing C.P.R. to expropriate land for Windsor St. terminals, Montreal.

16962. July 3.—Ordering G.T.R. to build farm crossing for E. N. Richards and G. H. Bennet, Windsor, Ont., on farm lot 102, con. 1, Sandwich East tp., Ont.

16963. July 5.—Relieving G.T.R. from further protecting crossing just east of milepost 8, near Transcona, Man.

16964. July 10.—Extending to Jan. 1, 1913, time for completion of spur by Esquimalt and Nanaimo Ry., authorized by order 15626, Dec. 14, 1911.

16965. July 5.—Relieving C.P.R. from further protecting crossing just west of mileage 123, Portal subdivision, Sask.

Samuel Price, K.C., of St. Thomas, Ont. is reported to have been appointed to revise and consolidate the Dominion Railway Act.

The National Steel Car Co., Ltd., has been incorporated under the Dominion Companies Act with an authorized capital of $6,000,000, consisting of $3,000,000 of 7% cumulative preferred shares and $3,000,000 ordinary shares. It is stated that the present issue of $1,500,000 preference shares and $2,000,000 of ordinary shares have been subscribed. The head office will be in Montreal, and the works at Hamilton, Ont., the directors being Sir John Gibson, W. Southam, and J. J. Scott, of Hamilton; Sir Henry M. Pellatt, Toronto; W. G. Ross, C. H. Cahan, M. Davis, and B. Magor, Montreal; W. B. Parsons, W. K. Brice, and M. H. Coggeshall, New York City. The company will be under the management of Basil Magor, at one time in the service of the Dominion Car and Foundry Co., of Montreal, and latterly connected with the Magor Car Co., of Passiac, N.J.

Canadian Northern Railway's Perpetual Consolidated Debenture Stock Issue.

The C.N.R. Co. issued a prospectus in London, Eng., recently of £1,438,356 ($7,000,000) 4% perpetual consolidated debenture stock at 95.

The trust deed provides that the total amount of debenture stock shall not exceed £2,000 a mile of line operated, and an amount not exceeding the cost price of securities of independent corporations deposited with the trustees. The debenture stock is secured by a general charge upon the undertaking, property and assets (other than land and money subsidies) of the company, subject to £1,180,600 of bonds primarily charged on the Ontario Division (287 miles), and to charges created, or to be created, not exceeding $10,000 a mile of line (other than the above mentioned 287 miles of line in Ontario) or $15,000 per mile if guaranteed by the Dominion Parliament, or any of the provinces, and is a specific first mortgage upon certain securities deposited with the trustees.

The proceeds of the present issue are required in anticipation of a great increase in business on the opening of the through transcontinental service, for the initial acquisition, construction or extension and equipment by the Canadian Northern System Terminals Ltd., of certain terminal and hotel facilities at important central points on the system including Quebec, Montreal, Ottawa, Toronto, Hamilton, Sudbury, Port Arthur, Winnipeg, Brandon, Regina, and Calgary. These terminal and hotel properties are, or as acquired will be, vested in the C. N. System Terminals, Ltd., but will be used by the C.N.R. under permanent lease or agreement. The C. N. System Terminals, Ltd., has created first mortgage securities to the extent of $7,000,000, which it has sold to the C.N.R. Co., and which have been deposited with the trustees for the debenture stock. The present issue of debenture stock is being made against these securities. It is expected that through trains will be running from Quebec to Vancouver early in the spring of 1914.

The C.N.R. is operating 4,100 miles, which include 644 miles of leased lines. In addition, about 500 miles of new branch lines have been completed and will shortly be opened for traffic, and over 500 miles more are under construction, a large proportion of which will be completed this year.

The Quebec Bridge Construction.

The principal work in progress on the site of the bridge across the St. Lawrence River near Quebec, is the sinking of the caisson for the south main pier. The dimensions of the caisson are 55 by 180 ft. by 40 ft. in height. It has been sunk to a depth of 21 ft. under ordinary high-water, and 4 ft. in the river bed under ordinary low water. It is expected that the caisson will have to be sunk to a depth of about 70 ft. before an absolutely safe foundation for the pier will have been reached. Three hundred men have been employed in three shifts under a five pound air pressure in the caisson, but as the depth increases, the number of men employed will be increased, and the period of working in the caisson will be shortened. There are in addition, about 300 men employed outside the caisson. It is expected that the caisson will be sunk to a proper depth and the pier erected by the fall. The masonry work on the other piers is being progressed with and it is expected to have everything completed by the fall, for the erection of the superstructure. The contractors for the substructure are M. P. and J. T. Davis, Quebec. (Sept., 1911, pg. 831.)

RAILWAY DEVELOPMENT.

Projected Lines, Surveys, Construction, Betterments, Etc.

Alberta Interurban Ry.—The Board of Railway Commissioners has approved of location plans for the line from mileage 1.25 to 2.28 in Calgary, Alta. An arrangement has been made whereby the company's Carbon line will enter Calgary over the G.T. Pacific Ry. tracks, to the station ground at the R.N.W.M.P. barracks, and thence proceed over the city's electric railway tracks to the market place. This arrangement, so far as the city is concerned, was approved by the city council, July 8. A site for shops has been leased by the city at a nominal rental, the work of reclamation to be done by the company.

The Minister of Railways has approved revised route map for the company's projected Carbon line.

Alberta, Peace River and Eastern Ry.—Application is being made to the Minister of Railways for approval of the route map of this projected line from Milk River, Alta., to Peace River and on to Fort Churchill, Hudson Bay. The application was opposed June 26, by other companies, and the Minister stated that he would investigate the matter during his trip to the West. (July, pg. 339.)

Algoma Central and Hudson Bay Ry.—Track laying was completed July 3, on the extension to the C.P.R. transcontinental line, the steel laying gangs connecting the last rails at mileage 109.75 north of Sault Ste. Marie, Ont. The point of connection is at Franz, 23 miles west of Missanabie station on the C.P.R. From this point the line is under construction to Hearst, on the National Transcontinental Ry. We are officially advised that ballasting on the extension is being proceeded with between mileage 93 and 195 at Franz, three steam shovels being at work. It is expected to have the section from Hawk Jct. and Franz, mileage 164.25 and mileage 195, completed ready to turn over to the operating department early in August. This will enable the operation of a regular train service between Michipicoten and the C.P.R.. It is expected that the ballasting on the line from mileage 93 to Hawk Lake Jct., will be completed by the end of October.

The work at the company's terminals at Sault Ste. Marie is, we are advised, proceeding satisfactorily. The station which is estimated to cost $100,000 and the yards and shop, which are estimated to cost $300,000, are well advanced, and their completion is looked for by winter. The company's steam shovel has been used on the yard excavation work, and it is intended to move it out to a ballast pit, in order to get out material for adding considerable ballast on the line between mileage 20 and 68, in order to bring it into first class shape. R. S. McCormick, Sault Ste. Marie, Ont., is Chief Engineer.

The Board of Railway Commissioners has authorized the opening for traffic of the extension from mileage 85 to 93 north of Sault Ste. Marie. On July 5, President Drummond, of the Lake Superior Corporation, owning the line, and other officers made a trip of inspection over the entire line to Franz and subsequently went over the extension under construction to Hearst. (June, pg. 299.)

Algoma Eastern Ry.—Grading on the extension of the line from the end of the present operated line at Crean Hill, Ont., to the terminal site on Goat Island, directly across the channel from Little Current, Manitoulin Island, has been completed, and 28.5 miles of track have been laid. The total distance from Crean Hill to Goat Island is 62 miles. Track laying has been delayed owing to lack of steel, but deliveries have now been made at Espanola and the work resumed. It is expected to have the 7.5 miles east to Crean Hill, and the six miles from Espanola to West River laid about Aug. 1. At this point track laying will be suspended for about a month, pending the erection of a combined timber and steel plate girder bridge. It is expected to complete tracklaying to the terminal yard site on Goat Island, as well as the ballasting from Crean Hill about the end of October.

Work on the terminal site at Little Current, and the construction of a bridge across the channel will be proceeded with this summer. There has been some delay in reference to the bridge on account of the requirements of the Public Works Department in regard to the width of the opening. This has now been adjusted and it is intended to put in a swing draw span on a centre pier in the channel, giving 150 ft. clear opening on each side. The balance of the structure, which will be about 600 ft. long, will consist of deck plate girders on concrete piers with end wing abutments. R. S. McCormick, Sault Ste. Marie, Ont., is Chief Engineer. (May, pg. 238.)

Atlantic, Quebec and Western Ry.—We were officially advised, July 5, that the whole of the line to Gaspe Basin, Que., had been completed and that it was expected to open it for traffic before the end of July. (July, pg. 339.)

Bruce Mines and Algoma Ry.—We have been officially advised that arrangements are being made for the company's financing, and that until these are completed nothing can be said as to the plans for future construction. (May, pg. 238.)

Central Ry. of Canada.—We are officially advised that the contractors have got well started on the first section of this line, and expect to have the grading completed early in September. This section extends from McAlpine, on the C.P.R., to Lemieux, Ont., 25 miles. The general contractors, C. J. Willis and Sons, London, Eng., and Montreal, have sublet several short lengths of grading to farmers in the district. F. S. Williamson, Montreal, is Chief Engineer. (July, pg. 339.)

Chicago, Milwaukee and St. Paul Ry.—Chicago, Milwaukee and Puget Sound Ry.—The latter line, which is an extension of, and controlled by, the first named was opened for traffic to Bellingham, Wash., July 11.

E. W. McKenna, Vice President, C.M., and St. P. Ry., is quoted as stating in reference to the reports referred to in our last issue, that the company had no intention whatever of entering Winnipeg, or invading Canadian territory, for some time to come, if at all. The company had not secured options for any right of way, nor had any surveys for such a line been completed.

Surveys are being made for a line from the C.M. and P.S. Ry. through Kalispell, Stillwell and the Tobacco valley, to Roosville, Mont., or Phillips Pass, to which point, the C.P.R. is reported to have made surveys for a line from Elko, B.C. (July, pg. 339, and June, pg. 299.)

Cumberland Ry. and Coal Co.—The Dominion Coal Co., which owns this line, is said to want to build a line from Springhill to Wallace, N.S., on Northumberland Strait, where it is proposed to establish a shipping point for its collieries. Hitherto the company has shipped its coal to Parrsboro, on the Bay of Fundy. J. H. Plummer, President, D.C. Co., had an interview with the Minister of Railways recently with a view of obtaining a subsidy for construction. Another report says that the line will be built as an Intercolonial Ry. branch. (June, pg. 21.)

Dominion Atlantic Ry.—A contract has been entered into between the company and the Dominion Government under the act granting aid to certain railways for the building of an extension of the company's line in Canning, N.S., to the government wharf there, one mile, (June, pg. 299.)

Edmonton, Dunvegan and British Columbia Ry.—The Board of Railway Commissioners has approved of location plans for the line from mileage 4 to 14, Alta.

Work is reported to have been started on laying out the terminals at Edmonton. A connection has been made with the G.T. Pacific Ry. yards, and several sidings laid, in order to provide for the handling of construction material. (July, pg. 339.)

Essex Terminal Ry.—The Board of Railway Commissioners has authorized the opening for traffic of the extension of the line through Windsor, Sandwich tp., and Sandwich, Ont. (Jan., pg. 22.)

Fredericton and Grand Lake Coal and Ry. Co.—We are officially advised that the profile plans show a line following the east bank of the St. John River from Gibson, N.B., for about seven miles, through an open, well-cultivated district: thence to the Little River, about the 20th mile, is through a wooded country, which has been lumbered over for many years; and from the Little River to within two miles of Minto, the line will pass through a well farmed district. Near Minto, where connection is made with the New Brunswick Coal and Ry. Co., is the coal area, which is to be tapped. The maximum gradient is 1% compensated for curvature and the maximum curvature is six degrees. The substructures of the bridges over the Nashwaak River, Noonan Creek, Burpee Mill stream and Little River are all of concrete. All curvert openings under embankments sufficiently high are to be concrete arch culverts, varying from 4 ft. to 10 ft. openings, and the smaller culverts are to be of corrugated galvanized iron pipe. H. W. D. Armstrong, Fredericton, N.B., is Chief Engineer. (July, pg. 339.)

We have been officially advised, that the projected branch line to Marysville, was being located.

A contract has been entered into between the company and the Dominion Government under the act granting aid to certain railways for the building of a line from the Intercolonial Ry. at Gibson, to Minto, with a branch line to Marysville, a total length of 35 miles.

Glengarry and Stormont Ry.—Press reports state that engineers have started making a survey for a line from near St. Polycarpe, southerly and westerly through Glengarry county to Cornwall, Ont. C. L. Harvey, C.E., is a provisional director of the company. (June, pg. 300.)

The survey party is in charge of H. S. Dickson, with M. J. McLennan as assistant, and is working between Cornwall and Williamstown. (June, pg. 300.)

Hudson Bay and Pacific Ry.—An order of the High Court of Justice, London Eng., has been granted directing the winding up of the H.B. and P. Ry. Development Co., which was started for the purpose of financing the construction of the line. A meeting of creditors is to be held in London, Eng., Aug. 7.

Intercolonial Ry.—Tenders are under consideration for the erection of a brick and stone passenger station at St. Flavie, Que.; a 10-stall locomotive house and annex with brick chimney, etc., at Point Tupper, N.S., and for the erection of an extension to pier 7, Richmond, N.S.

An Ottawa press dispatch says: "The government has decided to promote the shipment of coal from the Springhill, N.S., mines to the upper provinces by the construction of a spur line of the IR.C. from Springhill to Wallace. The harbor at Wallace will be dredged and docks constructed for the handling of the coal. Financial provision for this will be made at the next session of Parliament." Another report says the line will be built by the Cumberland Ry. and Coal Co. (See under that heading.)

Joliette and Lake Manuan Colonization Ry.—A contract has been entered into between the company and the Dominlon Government under the act granting aid to certain railways for the building of a line from Joliette, to or near Lake Manuan, Que., 60 miles. (June, pg. 284, and May, pg. 230.)

Kettle Valley Lines.—The Board of Railway Commissioners has approved location plans of the extension of the line from Penticton to Coldwater, B.C., plan of a 250 ft. deck span over Trout Creek near Pentlcton, and revised location plans of the line from mileage 0 to 53.07 west of Pentlcton.

An arrangement is reported to have been completed under which the K.V. Ry. and the C.P.R. are to have joint terminals in Grand Forks, B.C. The city council has granted a free right of way for additional trackage, and exemptlon from taxation for 10 years, and the companies undertake an initial expenditure of $200,000. The necessary bylaw to authorize the council to enter into the agreement is to be voted on at an early date. (July, pg. 339.)

London, Lake Erie and Tillsonburg Ry.—Press reports state that J. H. Teall, Tillsonburg, Ont., who controls thls charter, has sold out all his lnterests, together with the property he has acquired at Port Burwell ln connection with lt, to the G.T.R.

Michigan Central Rd.—A contract is reported to have been let to G. A. Ponsford, St. Thomas, for the erection of an engine dispatching house 100 by 50 ft., and an oilhouse 40 by 50 ft. at St. Thomas, Ont. (June, pg. 301.)

Minneapolis, St. Louis and Canadian Rd.—A company with thls title ls reported to have been lncorporated at Mlnneapolis, Minn., July 15 to build a lne from Watertown, S.D., to the Canadian boundary. Watertown is a central point on the Minneapolis and St. Louis Rd., between St. Louis, Minn., and Le Beau, S.D. N. Erb, of the M. and St. L. Rd., ls actively promoting the new company. (Jan., pg. 22.)

Minneapolis, St. Paul and Sault Ste. Marie Ry.—The Central Terminal Co., a subsidiary organizatlon, has finally secured possession of propertles bounded by Twelfth Place, West 15th St., South Canal St., and South Clinton St., Chicago, Ill., as a site for its terminals. The new terminals are estimated to cost $5,000,000. The work of demolishing the buildings has been in progress for some tlme, and will now have been completed, as the arbitration proceedings in connection with none of the properties have been closed. (June, pg. 301.)

Montreal Central Terminal Co.—A special meeting of shareholders is to be held in Montreal, Aug. 9, to elect directors, increase the capital stock, authorize an lssue of bonds, and the making of traffic agreements with all railway companies requiring terminal facilltles in or about Montreal. F. E. Came, 44 Beaver Hall Hill, is secretary. (May, pg. 239.)

North Ry.—We are officially advised that J. T. E. Lavoie is in charge of the party in making a preliminary survey for the line from the mouth of the Nottaway River on Hudson Bay, to Lake Matagami, Que.

The organization of the company ls reported to be about completed and the financial arrangements well forward. Surveys are reported completed for 120 miles north from the crossing of the Natlonal Transcontinental Ry., ln addition to the surveys from Montreal to that point, and it is said that it is expected to start construction next spring. (July, pg. 339.)

Northern Territorial Ry.—An office has been opened in Edmonton, Alta., by H. G. N. Neville, who is stated to be the Chief Engineer for this railway, and an unconfirmed press report states that ln the very near future 40 survey parties are to be put in the field, and in all some 800 men will be engaged on preliminary survey of the line from Edmonton to Hudson Bay. The report goes on to say:—"Next season grading of the road to the northeast and the laying of steel will be carried on, and in two years time, according to plans of the company, the line will be complete and in operation from Edmonton to Lake Athabasca. The company will then proceed with the construction of the line easterly to the north shore of Lake Wellaston in Saskatchewan and thence to Fort Churchill or Port Nelson, named as alternative ports under a federal charter. From Edmonton a cut off is to be constructed at a later date, giving connection with Hudson Bay by a still shorter route. From Lake Athabasca the road will run westerly north of the Peace River block, from Hudson Bay terminal. The railway will run steamships to a British port." (May, pg. 239.)

Northern New Brunswick and Seaboard Ry.—We are officially advised that of the mileage subsidized last session of the Dominlon Parliament, 16.7 miles, from the Drummond mines at Austin Brook, to the Intercolonial Ry., near Bathurst, N.B., have been built, and that surveys have been completed for the remaining 9.3 miles, to deep water in Bathurst Harbor. This latter mileage, we are advised, will not be built for some time. (May, pg. 239.)

Pacific and Hudson Bay Ry.—We have been officially advisod that the company has not yet been formally organized. It has power to build a line from the Pacific coast to Hudson Bay, about 1,500 miles, the first section being from Bella Coola, B.C., to Dunvegan, Alta. Three survey parties are in the field, and it is hoped to have the route on the first 700 miles surveyed by the end of the summer. The route map for the line from Kimisquit, near Bella Coola, to Natalkus Lake, B.C., about 110 miles, has been approved by the Minister of Railways, but application will shortly be made for the approval of a revised route. It is expected that the organization of the company will shortly be completed and arrangements made for starting construction early in 1915. H. D. Verschoyle, General Manager, Port of Bella Coola, Ltd., Vancouver, B.C., is interested. (June, pg. 301.)

Pacific Great Eastern Ry.—D'Arcy Tate, Vice President and General Counsel, is reported to have stated on his return to Victoria, B.C., from England, recently, that arrangements had been completed for a first lssue of $5,000,000 of the company's bonds, guaranteed by the province of Britlsh Columbia, and that it was expected construction would be started near the head of Howe Sound at an early date. P. Welch, Vice President, is quoted as stating, July 4, that it was expected to break ground at some point between North Vancouver and Howe Sound, within a month, and to crowd the work so as to have the line ready for traffic within two years. J. Callaghan, Vancouver, is Chief Engineer. (July, pg. 339.)

Quebec and Saguenay Ry.—It is expected, we are officially advised, to have the section of the line under construction completed to subgrade about Aug. 31. It is intended to start tracklaying simultaneously, from Cap Tourmente and from Ste. Irenee, Que. The latter is about six miles from Point au Pic, near Murray Bay., and is more convenient for the landing of rails. About ten miles west of Ste. Irenee the company has opened a ballast pit, from which ballast will be used for the eastern division from Baie St. Paul to La Chute, above Murray Bay. If the fall weather is favorable, it is expected to have the first lift of ballast completed so that the line will be opened for traffic in December.

The question of the proposed extension to Chicoutimi, we are advised, is for the present in abeyance. A. H. N. Bruce, Quebec, is Chief Engineer.

Representatives of the European financiers associated with Slr Rodolphe Forget, in the construction of this line, were in Montreal, July 7. Sir Rodolphe advocates the extension of the line to Cape St. Charles, and the establishment there of a port for trans-Atlantic passenger steamers. (July, pg. 340.)

Quebec Eastern Ry.—We are officially advised that surveys for this projected line from the southern approach to the Quebec Bridge, to Sherbrooke, Que., have been completed, and that lt is expected to start construction in the near future. A. H. N. Bruce, Quebec, is Chief Engineer. (June, pg. 301.)

Reid Newfoundland Ry.—At its recent session the Newfoundland Legislature authorized the government to raise a further amount of $1,000,000 in order to complete the branch lines authorized to be built in 1910, for which purpose $4,000,000 have already been expended. (May, pg. 240.)

The Southampton Ry. Co. has entered into a contract with the Dominion Government under the act granting aid to certain railways for the building of a line from Millville, on the C.P.R., St. John-Edmundston line, to the St. John River, near the Pokiok bridge, N.B. (June, pg. 302.)

Timiskaming and Northern Ontario Ry.—The T. and N.O. Commission is reported to have arranged with Jas. McMillan to make a survey of the country in the vicinity of Moose River, on Hudson Bay, with a view of locating a railway terminal there, and of developing a port for deep sea traffic. (July, pg. 340.)

White Pass and Yukon Route.—The Board of Railway Commissioners has authorized the British Yukon Ry. to open for traffic its branch from mile post 106 to Pueblo Mine, Yukon, 13 miles. (Aug., 1911, pg. 7571.)

President Dickeson is reported to have stated, prior to leaving Dawson, Yukon, July 15, that the company had an engineer locating an extension of the line from White Horse to Yuyon Crossing, 120 miles. Such a line would tap the Tantalus coal fields.

Retirement of J. J. Hill.—In a letter addressed to the stockholders of the Great Northern Ry., (U.S.A.), July 6, J. J. Hill says: "With my resignation today of the chairmanship of the board ends my active official participation in conduct of the G.N.R. The work begun nearly 40 years ago has been substantially accomplished; though its results have been extended far beyond the foresight of anyone at that time. The property whose fortunes I have directed for so many years has become an organic growth. Its future will be shaped more by the forces that govern development of the natural resources of the country than by individual initiative. I will remain a member of the executive committee, and any service it may need from me will always be at its command. But it seems wise to begin the process of adjustment to other hands at this time, when all the outlook is fair and every change may be weighed with deliberation in the light of what is for the best interest of the property."

The American Association of Railway Accounting Officers' annual convention was held at Quebec, June 26 to 28. During the meetings, the members were at various times the guests of the Quebec Ry. Light and Power Co., C.P.R., Quebec and Lake St. John Ry., Intercolonial Ry. and the Richelieu and Ontario Navigation Co. The officers for the current year are, President, M. P. Beauvelt, I.C.R., Chicago, Ill.; Vice Presidents, C. M. Beuling, Pennsylvania Rd., Philadelphia, Pa., and C. B. Segar, Union Pacific Rd., New York. J. Leslie, Assistant Comptroller, C.P.R., Montreal, was elected on the executive committee.

Grand Trunk Pacific Railway Construction.

Collingwood Schreiber, Dominion Government Consulting Engineer, started from Winnipeg, July 15, on his annual trip of inspection over the completed line of the G.T.P.R. and of the section of the main line, and the branch lines under construction. He went by rail to the end of track, and then proceeded along the right of way from Tete Jaune Cache by whatever mode of transport offered, to Van Arsdol, where the train service is available to Prince Rupert.

E. J. Chamberlin, President, returned to Montreal, July 15, after a trip to Winnipeg and some other points in the West. He said that while there was a shortage of labor the work through to the coast was being pushed forward. It was, however, questionable whether the line could be finished earlier than the end of 1914.

M. Donaldson, Vice President and General Manager, in an interview July 9, said the Mountain Division had been completed to the Fraser River, beyond Tete Jaune Cache, and supplies and material were being sent ahead by steamboats. This would greatly expedite construction, as heretofore all supplies for work had to be taken in over the tote road.

The Board of Railway Commissioners has authorized the opening of the line for traffic from Hinton, mileage 978 to Fitzhugh, mileage 1028. Beyond this point the contractors are operating construction trains, as far as Tete Jaune Cache, at mileage 1097.

From the western end of the line track has been laid to the Skeena River, the bridge across which was expected to be completed July 30. This bridge has a total length of 943 ft. 10 ins. between parapet walls, and consists of three 70 ft. deck plate girder spans, and three 240 ft. deck truss spans, resting on masonry. The base of rail is 112 ft. above high water level, 140 ft. above low water level, and 163 ft. to bottom of river. The main feature of the bridge is the two river piers which, owing to the depth of the water, had to be built with pneumatic caissons. These caissons were 41 by 89 ft., divided longitudinally into two working chambers. They were sunk to a depth of 177 ft. from base of rail, which gives a height for the concrete piers from foundations to seat of bridge of about 134 ft. Owing to the rapidity and depth of water at that place the 240 ft. truss span over the channel was erected without falsework.

From the eastern bank of the river, construction gangs are at work towards Fort George. The heaviest portion of the work is at Burns Lake, but it is not expected that this will be taken in hand until Jan., 1913, as it will not be possible to get the steam shovels and other plant in until track is laid.

At the terminals at Prince Rupert, Foley, Welch and Stewart have taken over the excavation contract let to Rich and Harris, and have sublet part of the work to A. McDougal and A. Rankin.

G.T.P.R. BRANCH LINES.

The Premier of Saskatchewan is reported to have informed President Chamberlin that the Provincial Government is prepared to make provision for the guaranteeing of bonds to provide adequate terminal accommodations for the company's lines at Saskatoon, Moose Jaw, and Swift Current, as well as for the completion of the terminals at Regina. Mr. Chamberlin is reported to have informed the Premier, June 27, that plans were being prepared to have the work at these places gone on with at once.

The question of the route by which the company's branch from Regina will enter Moose Jaw, Sask., is said to have been settled. The route, it is said, will be through the coulee north of the city, and the Crescent site selected by the Canadian Northern Ry. will be utilized as a joint station.

H. E. Bissell has been securing a right of way for the company's branch line from Yonge, into Prince Albert, Sask., and he is quoted as stating that tracks will be laid by the end of the year.

The Minister of Railways has approved a revised route map for about 11 miles of the Cutknife branch.

Location surveys are being made for the branch from Watrous to Swift Current, and press reports state that construction will be started at an early date.

We are officially advised that, while surveys have been made for a line from Watrous to Swift Current, Alta., the final location has not been settled, and no decision has been reached as to when construction will be started.

Track laying is being proceeded with on the branch from Biggar to Swalwell, where connection will be made with the branch from Tofield. This latter branch has been in operation for some time to Red Deer, mileage 83.5, and the Board of Railway Commissioners has authorized the running of trains from Red Deer to Trochu, at mileage 121.4. Track is reported to have been laid to Three Hills, about 10 miles north of Swalwell. It is further reported that grading will be completed into Calgary early in Aug., and that track will be laid by the end of the year.

The Minister of Railways has approved route map for the branch from Calgary to Coutts, Alta., of 46 miles. A Lethbridge dispatch, July 17, states that the contract for building this line has been let to J. D. McArthur, Winnipeg.

Track is reported to have been laid on the Albert coal branch, to 33 miles from Bickerdike, Alta., and it is expected to complete the remaining 25 miles this year. (July, pg. 341.)

National Transcontinental Railway Construction.

The Dominion Premier, prior to sailing for England, recently said the Dominion Government fully appreciated the importance of the port of Quebec and the necessity of pushing forward the development of the harbor, and the construction of the terminals for the N.T.R. to a completion as soon as possible.

The contractors for the building of a line, and the laying out of terminals t Cap Rouge, in connection with the Quebec Bridge, M. P. and J. T. Davis, have made considerable progress with their work, and it is expected that it will be sufficiently advanced to permit the operation of trains early in Sept.

Daily papers of July 9, contained an interview with M. J. O'Brien, railway contractor, of Renfrew, Ont., which reported him as stating that at points east of Cochrane, Ont., the contractors were altering the 0.4% gradient, called for by the contracts to something steeper, and telegrams from Cochrane stated that R. W. Leonard, Commissioner, N.T.R., had decided to increase the gradients from 0.4% westward and 0.6% eastward to 0.8% and in some cases to 1%, with the object of saving upon construction. The Department of Railways gave out an official denial of the report July 15, and the G.T. Pacific Construction Co., which is building one of the sections where the alteration was said to be going on, has also denied the report.

It was reported, July 10, that track had been laid to 156 miles east of Cochrane, and to 206 miles west of Cochrane. Grading is practically completed through to Superior Jct., and it is expected that the building of the bridges and the tracklaying will be completed on the line easterly from Winnipeg to Cochrane, by the end of the year.

A station building, roundhouse, etc., has been completed at Hearst, at which point the Algoma Central and Hudson Bay Ry. will cross on its way to Hudson Bay.

We are officially advised that contracts for the construction of station and other buildings, referred to on pg. 291 of our June issue, have been let as follows: P. Cauchon, Quebec; Thetford Contracting Co., Black Lake, Que.; Moncton Construction Co., Moncton, N.B.; G. Goodwin, Ottawa. The contract for the equipment of mechanical coaling plants at Moncton, Napadogan, Edmundston, N.B.; Grant, Colvert and Armstrong, Ont., has been let to Williams and Wilson, Ltd., Montreal.

An extensive forest fire, June 28, near Superior Jct., is reported to have caused damages to the amount of about $100,000 to the ties and bridges on the line easterly. Five trestle bridges and thousands of tles waiting shipment are said to have been burned. (July, pg. 341.)

The Will of the Late James Oborne.

The will of the late James Oborne, General Superintendent, British Columbia Division, C.P.R., who died at Vancouver a short time ago, was probated at Toronto, July 16, It disposes of an estate of $37,897.48. A Ross Oborne, the eldest son, receives the silver tea service presented by Winnipeg wholesale merchants when Mr. Oborne left there for St. John, N.B., some years ago. The balance of the estate is to be administered for the benefit of the widow and children until the youngest child is 21 years of age, when it is to be divided among Mrs. Oborne, the two sons and four daughters in equal shares of $5,199.64 each. If Mrs. Oborne remarries she is to receive the income of only one half her share.

Following are extracts from the will:— "My desire is to preserve the family tie; that is that all members thereof shall be thoroughly loyal one to the other; that they shall be sober-minded, teetotalers, virtuous, good and truthful, all working together for the good of the family and mankind; that each member of the family shall treat the others like ladies and gentlemen, be kindly affectioned one to another, and be good and generous to their stepmother. I desire that a family home be maintained so long as there is necessity for it, and that the children be loyal to each other and to their stepmother. I should like my eldest son to take his place as the head of the family, and retain it by good conduct and attention to business and to the family, and to him I bequeath the silver tea service presented to me by the wholesale merchants of Winnipeg." It is also requested that the silver service be handed down from eldest son to eldest son, each having his name engraved on the tea kettle, so that it may remain in the family as a remembrance of the original recipient.

Development of the Railway Systems of the World.—The length of the railway lines at the end of 1909 (the latest figures available) are as follows: Europe, 329,691 kilometers; America, 513,824 kilometers; Asia, 99,436 kilometers; Africa, 33,481 kilometers; Australia, 30,316 kilometers, or a total of 1,006,748. The average cost of construction per kilometer of line is $76,718 for Europe, and $41,785 in other parts of the world. On this basis the European railways at the end of 1909 would have cost $25,293,000,000, while the railways in other parts of the globe would have cost $28,829,100,000.

W. F. Joly and J. P. Heffernan were each fined $25 and costs, at Winnipeg recently, on a charge of conspiracy to obtain a situation from the C.P.R. by fraud. The former applied for a position of switchman, and being defective in sight and hearing, got the latter to personate him before the medical board when called on for examination.

Great Northern Railway Lines in Canada.

Speaking recently in Victoria, the British Columbia Premier said with reference to the rumors of G.N.R. developments in the province, that he had been informed by L. W. Hill, that the company had decided to proceed with its construction work, and that it is intended to complete the Vancouver, Victoria and Eastern Ry., to extend its lines on Vancouver Island, and to do other work in the province. It was not possible to state definitely what all the plans included, but he was informed that it is intended to let contracts for extensive construction at an early date, and that no time will be lost in going ahead with the work.

Vancouver, Victoria and Eastern Ry. and Navigation Co.—The question of the route of the line through the Hope Mountains, which is a matter of controversy with the Kettle Valley Lines, is in process of solution. An inspection of the route in dispute was made July 26, and following days by J. H. Kennedy, Chief Engineer, V.V. and E.R. and N. Co. A McCulloch, Chief Engineer, K.V.L., and A. J. Kerr, representing the Board of Railway Commissioners. The route in dispute extends from Hope to the Coquihalla summit, 35.5 miles and the cost of construction is placed by Mr. Kennedy at $3,500,000. It is suggested that the two companies join in the building of a double track route between these points. The matter is to be considered by the Board of Railway Commissioners at its present Western sittings.

The Chief Engineer of the G.N.R. made an inspection recently of the construction in progress, and in an interview stated that ballasting was in progress between Princeton and Coalmount, and that it is expected to have track laid to Tulameen by the fall. Grading is in progress beyond Tulameen.

Vanvouver to New Westminster.—Press reports state that it has been arranged to build a second track on the line from Vancouver to New Westminster, B.C., and that the work will be done by the company's own staff.

Victoria and Sidney Ry.—Application is being made under the provisions of the Navigable Waters Protection Act., 1906, for approval of the plan and site of a proposed car barge landing at Sidney, B.C. (July, pg. 361.)

Dominion Government Railway to Hudson Bay.

We are officially advised that the contract for the second section of the Dominion railway to Hudson Bay, which it is about to let, will extend from Thicket Portage, the end of the section now under construction, to Split Lake, 68 miles. The work on this section is considered to be the heaviest on the route. The grading will average about 35,000 cubic yards a mile. The maximum gradient is 0.4% each way, but there is a considerable amount of curvature, mostly of two and three degrees, and there are two or three points where curves of four degrees are required. The principal bridge structure is over the Nelson River at Manitou rapids, where the river is confined to a channel about 408 ft. wide. The engineers have not sounded the channel, but from the known discharge of the river and its estimated velocity at this point, the depth must exceed 100 ft. It is probable that the bridge will be a single through truss span of about 480 ft. Outside of this there will only be a few girder spans on the section.

J. Armstrong, Chief Engineer, in an interview, is reported to have stated that he had recently completed an inspection of the work in progress on the line. The steel superstructure of the bridge across the Saskatchewan River at Le Pas is well advanced, and the bridge will be completed by the end of the year. The bridge, in addition to carrying a railway track, will have a 12 ft. roadway on each side. The grading on the line, which was sublet by J. D. McArthur to McMillan Bros., is well advanced.

Engineer Moffatt, who has been making surveys at Port Nelson, with a view of determining its possibilities, from a railway point of view, as the terminus of the line, since March, returned to Le Pas, via Norway House, July 17.

The question of the terminal on Hudson Bay will be looked into by the Minister of Railways, who has arranged to start out on an inspection trip from Le Pas, Aug. 10, visiting both Port Nelson and Fort Churchill. (July, pg. 361.)

Appointment of Chief Railway Commissioner.

Henry Lumley Drayton, K.C., heretofore Counsel for the city of Toronto, has been appointed Chief Commissioner of the Board of Railway Commissioners for

P294 H. L. Drayton, K.C., Chief Commissioner, Board of Railway Commissioners.

Canada, vice James Pitt Mabee, deceased. He was born at Kingston, Ont., Apr. 27, 1869, was educated in England and Canada, and commenced his legal career in 1886, as law student in Toronto. He was admitted to the Ontario bar in 1891 and commenced practice. He was appointed Assistant Solicitor for the city of Toronto in 1893, and resigned in Sept. 1900, to engage in private practice. On Jan. 29, 1904, he was appointed Crown Attorney for the county of York, Ont., and resigned in Nov. 1909 to resume private practice. He was appointed a K.C. Jan. 20, 1908, and on Apr. 25, 1910, was appointed counsel for the city of Toronto.

On the adoption by the city of Toronto, of the Ontario Government hydro-electric system, he was also appointed a member of the commission formed to manage affairs connected with it.

He is a member of the Engineers' Club of Toronto, the Toronto Club, Toronto Hunt Club, Ontario Jockey Club, Rosedale Golf Club, Glen Major Fishing Club and Toronto Racquet Club.

Unconfirmed press reports state that the Chief Commissioner's salary is to be increased to $15,000 a year, as soon as the matter can be brought before Parliament. In 1908, legislation was passed providing for a reorganization of the Board, so as to consist of six members, a Chief Commissioner with a salary of $10,000 a year, an Assistant Chief Commissioner at $9,000, a Deputy Chief Commissioner and three other members at $8,000 a year each.

Grand Trunk Railway Betterments, Construction, Etc.

E. J. Chamberlin, President, H. G. Kelley, Vice President, and W. G. Brownlee, General Transportation Manager, completed an inspection of the G.T.R. lines, July 15. In passing through Toronto, July 13, the President said a general policy of improvement of the company's terminal facilities between Toronto and Chicago, would be started at once. It was impossible to state what would be done, but the improvements would be made as fast as possible. He had nothing to say as to the Toronto union station plans, as the company had not received any definite notification of the C.P.R.'s intentions. The present plans might be utilized or not, if the C.P.R. did not cooperate, but it was improbable that anything would be done until the definite order had been received from the Board of Railway Commissioners.

Richmond, Que.—Plans have been filed with the town council of Richmond, Que. for a new station building, the estimated cost of which is $20,000.

St Lambert and Turcot Yards.—Vice President Dalrymple advised the Transportation Bureau of the Montreal Board of Tradc, July 4, that plans have been prepared for laying out additional trackage, and carrying out other improvements at the yards at St. Lambert and Turcot. The intention is to handle all through freight at these yards, so as to permit the Montreal yards to handle local freight only.

Brockville Roundhouse.—We are officially advised that there is no foundation for the press report that the roundhouse and shops at present located at Brockville, Ont., are to be removed to Prescott, Ont.

Cobourg, Ont.—The Board of Railway Commissioners has approved plans for new tracks for the G.T.R. in Cobourg, Ont., on lands of W. J. Crossen, and of the Field estate.

Brantford, Ont.—The Board of Railway Commissioners has authorized the company to extend its passing track and re-align its main line over the county line road in Brant tp., Ont.

Galt-Berlin-Elmira Branch.—Residents of the district served by this branch line have petitioned the company to operate it by electricity in order that a better service be given. (July, pg. 343.)

Boulianne and Jalbert, Ltd., has been incorporated under the Dominion Companies Act, with $50,000 capital, and office at Chicoutimi, Que., to carry on a general contracting business, for the construction of railways, wharves, etc. The incorporators are, T. and H. Jalbert, Chicoutimi; T. and J. Boulianne, Chambord; and R. Lindsay, Roberval, Que.

The F. H. McGuigan Co., Ltd., has been incorporated under the Quebec Companies Act, with $100,000 capital, and office at Montreal, to carry on a general contracting business for the construction of public and private works of all kinds, including railways, tramways, tunnels, harbors, docks, dredges, telegraph and power plants, etc. The incorporators are, F. H. McGuigan Jr.. A. G. B. Claxton, T. R. Kerr, D. Laughlin, and A. S. Hawnes, Montreal.

Traffic Orders by the Board of Railway Commissioners.

The dates given for orders are those on which the hearings took place, and not those on which the orders were issued:—

Classification of Gramophones and Records.

16705. June 5.—Order 16479, May 10, 1912, directing that in the Canadian Freight Classification, gramophones, graphophones, phonographs and records be transferred from their present positions to the Musical Instruments List, and that they be also included in the second class rating applicable to Musical Instruments, all kinds, not otherwise specified, carloads, minimum 12,000 lbs., is to be put into effect by the railway companies not later than July 15, 1912.

Indicating Changes in Tariffs

16900. June 27.—Re indicating changes in freight, passenger and express tariffs: It appearing to the Board that comparison of freight, passenger, and express schedules with those which they supersede or amend, should be facilitated; and in pursuance of the powers conferred by sec. 322 of the Railway Act; and upon the report and recommendation of the Chief Traffic Officer, it is ordered that all freight, passenger and express tariffs, and supplements thereto, applying between points in Canada, or from any point in Canada, to a foreign country, filed with the Board on or after Sept. 1, 1912, shall, except as hereinafter provided, indicate advances thereby made in existing tolls by the symbol "A" (capital), and reductions by the symbol "R" (capital), with the necessary explanatory note, in the following manner, namely:

1. Schedules which show the rates opposite the stations. The proper symbol to be shown against each rate, or each rule or regulation, changed.

2. Schedules in which the rates appear in a table separated from the station list —(a) Unless the station groupings have been varied relatively to their rates, the proper symbol to be shown in the rate table in the manner prescribed in sec. 1. (b) If the station groupings have been varied relatively to their rates, the proper symbol, or symbols, to be shown against the reference on the station page to the rate table, and against each rule or regulation changed.

Provided that if any rates or matter be necessarily so closely printed as to leave insufficient space for the symbols, or if the latter be otherwise unsuitable, and in such cases only, increases shall be printed in full-faced type, and reductions in italics. And it is further ordered that the requirements that the title page, or front cover, of all tariffs and supplements bear, at the top, the word (or words) "Advance," "Reduction," "Re-issue," or "New Rates," as the case may be, is not hereby abrogated.

Eye and Ear Tests for Railway Employes.

The Assistant Chief Commissioner, Board of Railway Commissioners, D'Arcy Scott, gave the following judgment, June 28:—

On November 9, 1910, the Board issued order 12225, which, among other things, required that certain employes on train and engine service should undergo an eye and ear test before a competent examiner. The railway companies do not interpret those provisions of the order in the same manner, and a question has arisen as to whether the examination of the seeing and hearing of employes should take place indoors or out in the open, under conditions as they would get them in actual employment on the railway.

The matter was discussed at length before the Board on Oct. 3, 1911, and judgment was reserved. Representatives of different companies had submitted a majority and a minority report in connection with the matter, and the Board has had the benefit of a very carefully prepared report from its Chief Operating Officer. A majority of the railway companies desire to have an indoor test only, both for those seeking employment in the railway service for the first time, and those already in the employ of the company who must pass a satisfactory test in order to retain their positions, or be promoted.

The minority report of the railway companies, which is practically endorsed by the employes' representatives, recommends the indoor test under certain conditions. Undoubtedly, the indoor test is more convenient for the railway officials, and more accurate than the outdoor test, and in some respects a more definite standard of seeing and hearing can be established by it. The outdoor, or field test, is a difficult one to submit a man to on all occasions, owing to the changeable conditions of the weather, atmosphere, etc.—but under favorable circumstances it is, I think, by far the more satisfactory test, especially for a man who has had experience in railway service. I think, therefore, that we might lay down the following general principles to govern in this matter:

1. No person shall be employed in railway service until he has passed the indoor test satisfactorily.

2. Any employe going up for a periodical examination or an examination for promotion, shall be examined by the indoor test; and in case he fails to pass the indoor test satisfactorily he shall be given an outdoor test, according to the uniform rules submitted herewith; and in such case the latter shall be taken as the governing test; and, during the outdoor examination, the candidate shall be permitted to wear glasses, as provided for in the said rules, if he wishes to do so.

For the purposes of this memorandum, promotion means going from fireman to engineer, or from trainman to conductor; but it does not mean a change from freight service to passenger service without a change of rank, such as a freight engineer being made a passenger engineer, or a freight conductor being made a passenger conductor.

As to the wearing of glasses while on duty, I think any employe who requires to use glasses should be encouraged to do so, but he should be required always to carry a duplicate pair with him lest an accident may happen to those he is wearing.

There are a number of details respecting the method and character of both the indoor and outdoor tests to which the Chief Operating Officer has given careful consideration. He has submitted a code of rules on standards of visual acuity, which is attached hereto, and which he recommends for the approval of the Board as uniform rules governing the determination of visual acuity, color perception, and hearing of employes on steam railways. I think the Board should adopt these rules as its standard.

This judgment was concurred in by Commissioners Mills and McLean. The order had not been issued up to July 23.

Tests on the Grand Trunk Railway.

We are officially advised that the Board's decision will make very little difference on the G.T.R., as that company's tests for prospective employes have always been very rigid and all trainmen, yardmen, engineers, and firemen are required to go through an eye and ear test every three months of their service. The indoor tests consist of holding a set of cards with letters of different sizes at a distance of 30 ft. from the candidate; a glass being placed over one eye while the other is being tested. There is also a small card with small letters which is held at a distance of 30 ins. Each employe must be able to distinguish all letters. After this reading test, comes a color test, which consists of telling different shades of yarn. In this a box containing 67 shades and 7 shades of each color is used and an employe must be able to distinguish between them. In the hearing test one ear is plugged and a clerk recites a phrase which must be repeated correctly by the employe who is 30 ft. away.

Canadian Northern Railway Earnings, Etc.

Gross earnings, working expenses, net profits, increases or decreases, compared with those for 1910-11, from July 1, 1911:—

	Earnings.	Expenses.	Net Earnings.	Net Increase
July	$1,475,800	$1,114,300	$361,600	$13,400
Aug.	1,420,600	1,105,900	314,700	51,700
Sept.	1,576,400	1,157,000	419,400	38,200
Oct.	2,028,900	1,348,500	680,400	99,900
Nov.	2,001,500	1,336,300	665,200	106,300
Dec.	1,831,400	1,327,600	503,800	144,000
Jan.	1,223,100	1,004,400	223,706	122,000
Feb.	1,203,400	965,800	237,600	101,800
Mar.	1,572,700	1,145,900	426,800	72,000
Apr.	1,608,100	1,205,000	403,100	42,000
May	1,822,100	1,364,000	458,100	54,900
	$17,769,100	$13,074,700	$4,694,400	$846,800
Inc.	$4,035,200	$ 3,188,400	$846,800	... .

Approximate earnings for June, $1,769,500, against $1,465,300 for June, 1911.

Mileage in operation 3,851, against 3,354, same period, 1911.

Canadian Pacific Railway Earnings, Etc.

Gross earnings, working expenses, net profits, increases or decreases, compared with those for 1910-11, from July 1, 1911:—

	Earnings.	Expenses.	Net Profits.	Net Increase
July	$ 9,661,818.14	$5,958,789.81	$3,703,028.33	$218,408.74
Aug	10,421,904.42	6,346,333.41	4,075,571.01	388,898.68
Sept.	10,049,084.97	6,131,638.17	3,917,446.80	5,847 16
Oct.	11,207.991.99	6,526,887.24	4,631,104 75	175,944.23
Nov.	10,570,694.80	6,583,328.31	3,987,366.46	250,244.23
Dec.	10,654,871.67	6,549,141.41	4,105,730.26	819,196.37
Jan.	7,328.781.81	6,245,924.11	1,082,857.70	426,739.83
Feb.	8,931,907.20	6,548,040.53	2,338,866.67	1,239,159.16
Mar.	10,519,328.76	6,8 0,317.65	2,718,401.11	561,334.57
Apr.	11,301,349.46	7,185,597.67	4,115,751.79	958,777.18
May	11,360,420.81	7,679,905 58	3,680 515.23	736,430.47
	$112,008,144.03	$72,556,503.89	$39,451,640.14	$5,776,480.62
Inc.	$17,319,986.18	$11,543,505.56	$5,776,480.62	.....

Approximate earnings for June, $10,848,000, against $9,040,000 for June, 1911.

Commencing with July 1, the mileage in operation, was increased to 11,117.

Grand Trunk Railway Earnings, Etc.

Following are the earnings of the G.T.R., C.A.R., G. T. Western Ry., and D.G.H. and M. Ry., for May, as compared with those for May, 1911:—

GRAND TRUNK RAILWAY.

	1912.	1911.
Earnings	$3,366,300	$3,060,000
Expenses	2,359,300	2,041,000
Net earnings	$1,007,000	$1,019,000

CANADA ATLANTIC RAILWAY.

	1912.	1911.
Earnings	$ 202,100	$ 185,650
Expenses	204,400	177,400
Net earnings	$ 2,300	$ 8,250

GRAND TRUNK WESTERN RAILWAY.

	1912.	1911.
Earnings	$ 557,400	$ 528,300
Expenses	441,300	485,200
Net earnings	$ 116,100	$ 43,100

DETROIT, GRAND HAVEN AND MILWAUKEE RY.

	1912.	1911.
Earnings	$ 177,500	$ 168,000
Expenses	173.600	160,000
Net earnings	$ 3,900	$ 8,000

Approximate earnings for June, $4,653,475, against $4,437,438 for June, 1911.

TRAFFIC RECEIPTS OF THE SYSTEM.

Aggregate from Jan. 1, to June 30:—

	1912.	1911.	Increase.
G. T. R.	$18,605,299	$17,333,392	$1,272,907
C. A. R.	1,046,129	999 631	46,498
G.T.W.R.	3,202,444	3,197,363	5,081
D.G.H. & M.R.	1,017,878	1,006,049	11,829
Totals	$23,871,750	$22 536,435	$1,335,315

Canadian Pacific Railway Construction, Betterments, Etc.

Windsor St. Station, Montreal.—The interior and other work on the enlarged Windsor St. station and office building had been so far completed that the members of the staffs began to take possession of their new quarters, June 17. It is expected that the transfer of the various departments will be completed by November.

The entire ground floor of the station will be occupied by shops, and offices have been reserved for the Bank of Montreal. The main entrance at the corner of Windsor and St. Antoine streets, consists of a vestibule 40 ft. square, while the general waiting room is 58 by 132 ft. Off this is a ladies' waiting room, a nursery, and smoking room, all with lavatory accommodation. The refreshment room, and dining room are conveniently situated and special provision is made for the immigrant traffic.

Campbellford, Lake Ontario and Western Ry.—The Board of Railway Commissioners has approved location plans for the line from mileage 94 to 97, and from mileage 106.17 to mileage 121 from Glen Tay, Ont.

A bylaw has been passed by the taxpayers of Trenton, Ont., granting a free site for a roundhouse and station, with a nominal assessment for ten years, the company agreeing to make Trenton a divisional point.

The contractors are pushing construction as fast as possible. Malvern is the centre of the construction work at the east end of the line, and other centres are at Trenton, working easterly, and Bayside, working westerly. Deeks and Hinds, the general contractors, have their headquarters at Agincourt.

Agincourt to Toronto.—In connection with the building of the new Lake Shore line, J. W. Leonard, Assistant to Vice President, is quoted as stating that it had been decided to build a second track on the present line easterly from Yonge St. through Leaside, Donlands, and Wexford, to near Agincourt, where the Campbellford, Lake Ontario and Western Ry. joins the main line. The contract for the substructures of the new bridges to carry the double track across the main Don, the west Don, the Belt Line ravine, and the reservoir ravine would be let at once, so that the steel work could be put up in the spring.

Georgian Bay and Seaboard Ry.—A regular freight and passenger service was inaugurated on this line July 2, the Board of Railway Commissioners having authorized the opening for traffic of the 7 miles from Coldwater to Bethany, Ont. The trains run through to Port McNicoll, to and from which point the company's upper lake steamers sail five days in the week, for Port Arthur and Fort William.

North Toronto Improvements.—J. W. Leonard, Assistant to the Vice President, in an interview in Toronto, July 16 is quoted as saying, that the plans for the new union station at North Toronto with the Canadian Northern Ry. had been approved, and that work would be begun within a month. The building would be sufficiently large to accommodate satisfactorily the two railways which are to use it. Its size and appointments would be in keeping with the rapid growth of the city, and worthy of the Toronto of the future. He said definitely that the company would not build a hotel in Toronto, as has frequently been rumored.

The Board of Railway Commissioners has approved plans for the track elevation at North Toronto, and has ordered that plans be filed for the subways at Yonge St. and Avenue Road. The Board has also approved plans for the elevation of the C.P.R. and the Canadian Northern Ry. from Summerhill Ave. to Dovercourt Road, with some alterations.

Toronto Freight Yards.—The tearing down of the old government house and the other buildings on the King-Wellington St. site is practically completed, and it is expected that the new freight sheds on the site will be under construction early in August.

In connection with the laying out of the yard an extensive piece of work is being carried out along the Front St. embankment, east of Bathurst St. A retaining wall is being built, in such a way that 25,000 cubic yards of the present bank can be cut away, to form a lead starting from under the Bathurst St. bridge, up to the yards. It is expected that this part of the work will be completed by the end of August.

South Ontario Pacific Ry.—The first section of this railway, viz., from Guelph Jct. to Hamilton, Ont., 16.3 miles, was opened for traffic July 1.

Sudbury-Port Arthur Second Track.—The second track work between Sudbury and Port Arthur, to which reference was made on pg. 349 of our last issue, is being carried out under the supervision of B. C. Huffman, for the Dominion Construction Co., which has the contract. His headquarters are at Sudbury.

In an interview in Toronto, July 16, J. W. Leonard, Assistant to the Vice President, is quoted as stating that the 60 miles of work already let would be completed this season.

Spur Lines at Fort William, Ont.—The Board of Railway Commissioners has directed the company to build a spur line along Neebing Ave., for the benefit of the industrial plants being established along the Kaministikwia River.

North Transcona Freight Yards.—Press reports state that contracts for $2,000,000 of work have been let in connection with the laying out of the new freight yards at North Transcona, Man.

Portage la Prairie to Brandon Second Track.—The Board of Railway Commissioners has authorized the opening for traffic of the second track from Melborne to Carberry, Man., six miles.

Estevan Westerly.—A route map for a line from Estevan, Sask., westerly for 96.5 miles has been approved by the Minister of Railways.

Pasqua - Caron Second Track.—The Board of Railway Commissioners has authorized the opening for traffic of the second track from Moose Jaw to Caron, Sask., 16.2 miles.

Touchwood Hills Branch.—The Minister of Railways has approved of a route map for a revision of the Touchwood Hills branch, for 48.8 miles.

Moose Jaw Southwesterly. — The Board of Railway Commissioners has authorized the opening for traffic of this branch from mileage 27.4 to 35, and has approved of location plans for its extension from mileage 37.85 to 64.47. The plans for this branch show that it will connect up with the line now under construction from Swift Current, southeasterly.

Moose Jaw Northwesterly.—The bridge across the Saskatchewan River, a little north of Outlook, which was described on pg. 215, of our issue of Mar., 1910, is expected to be completed early in November. This will connect up Moose Jaw by means of the branch already completed, with the Portage la Prairie-Wetaskiwin line at Macklin.

Swift Current, Northwesterly.—The Board of Railway Commissioners has authorized the opening for traffic of this branch from mileage 33 to 34.8, a point beyond Cobri, Sask.

Weyburn-Lethbridge Line.—The Board of Railway Commissioners has approved of location plans presented by the Alberta Ry. and Irrigation Co., which is building the western end of the line, for the route from Stirling, Alta., easterly for 37.14 miles. The contractor for the grading of the first 25 miles, has the work well in hand, and the bridge building gang started work at Stirling, July 8.

Sedgewick Southerly.—A route map for a line of 23.6 miles from Sedgewick, Alta., southerly, has been approved by the Minister of Railways.

Suffield Southwesterly.—Grading is in progress south of the Bow River, on the section of the line from Kipp towards the mileage under construction from Suffield, Alta.

Alberta Central Ry.—The Minister of Railways has approved of route maps for this line from mileage 140 to the Yellowhead pass, Alta., 165 miles.

Calgary to Vancouver Second Track.—We are officially advised that five engineering parties are in the field preparing plans and estimates for the building of a second track between Calgary, Alta., and Vancouver, B.C., 812 miles. The location surveys have not yet been sufficiently far advanced to state definitely what changes in alignment, etc., will be made. F. F. Busteed, is Engineer in charge of grade revision and double tracking, Calgary west, with office at Kamloops, B.C. Press reports state that one of the results of surveys made, show that by the construction of a five mile tunnel through the Selkirk range, starting at Bear Creek and terminating below Glacier, a gradient of less than 1% against western traffic can be obtained, and that by a division at Notch Hill, just east of Kamloops, the 1% gradient could be obtained from Calgary to Vancouver.

Kaslo and Slocan Ry.—Some temporary work has been done on the existing narrow gauge line in order to permit the operation of trains for construction purposes, and to enable the present mineral traffic to be got out, pending the complete reconstruction of the line.

Trail to Metalline, B.C.—Press reports state that a survey has been made for a line from Trail, B.C., to Metalline, on the International boundary, where connection can be made with a branch line of the Idaho and Washington Northern Rd. The last spike of this line was driven, June 24.

Grand Forks, B.C.—An agreement has been reached between the city council, the C.P.R. and the Kettle Valley Lines, whereby the two railways will lay out union terminals in the city. The city gives a free site and exemption from taxation for ten years. The companies will make an initial expenditure of $200,000 on buildings.

Grain Elevators at Vancouver, B.C.—George Bury, Vice President, informed the Vancouver Board of Trade recently that the company would have a grain elevator ready at its deep water terminals by the end of 1914. He would be prepared towards the fall to give the Board fuller information as to this, and the company's other plans for handling the business at Vancouver. (July, pg. 344.)

Sliding of Railway Fills built on ground which is underlaid by limestone strata are prevented on parts of the St. Louis and Southwestern Ry. by breaking up the surface of the rock with dynamite, according to J. P. Warren, Assistant Roadmaster, at Tyler, Tex. Fills on ground of this character had been found to give trouble due to the seepage of water through the overlying ground to the surface of the rock, causing slipping at that point.

The third annual sports of the C.P.R. European staff, were held at Acton, Eng., June 29.

A London, Eng., cable states that Herr Van Kramer, in conjunction with Herr Van Kapp, has invented an apparatus by which a signalman is enabled to stop a train at a distance of 20 miles by merely pressing a button in his cabin.

The Death of Cecil B. Smith.

Cecil Brunswick Smith, Ma. E., M. Can. Soc. C.E., one of the most active and prominent engineers of Canada, died at his home in Toronto, on July 1. Two weeks before, he had been engaged in his customary professional activities on the Pacific coast. At that time he consulted a specialist in California, who warned him that he was suffering from an internal cancer and had not long to live. He returned to his home in Toronto, to close up his affairs as soon as possible. Until the specialist's examination, Mr. Smith had no knowledge of his serious malady.

He was born at Winona, near Hamilton, Ont., 48 years ago. He was educated at the Collegiate Institute at Hamilton and the School of Applied Science of McGill University, Montreal, Que., where he graduated in civil engineering in 1884, when but 19 years of age. For his high standing in scholarship he was awarded the Governor General's Gold Medal for that year.

Following his graduation he was Resident Engineer on construction of the Nipissing and Pacific Junction Ry., now part of the Grand Trunk Ry., and later of the St. Catharines and Niagara Central Ry. From 1887 to 1888 he was Resident Engineer on the construction of C.P.R. between Woodstock and Windsor, Ont.; and for a year was Locating Engineer of the Toronto, Hamilton and Buffalo Ry.

After two years in the United States, spent as division engineer and chief assistant engineer of railways constructed in North and South Carolina, Virginia and Maryland, he returned to Canada to become Assistant Professor of Civil Engineering at McGill University, a position he continued to hold for five years, until 1898. During this period he made a special study of the characteristics of Portland cement and was the author of several papers dealing with this subject. He also wrote a text book on railway engineering.

In 1898 he was appointed locating engineer of the C.P.R. on the line between Toronto and Sudbury, Ont. The following three years he served as Assistant City Engineer of Toronto. In 1901 he was appointed Resident Engineer on construction for the Canadian Niagara Power Co., and between 1901 and 1905 built the present plant of that company at Niagara Falls, Ont. At the close of this work he became Chief Engineer of the first Hydro-Electric Commission of Ontario and organized the very complete water power surveys which were conducted in 1906 and 1907. The reports of this work have formed the basis of all water power developments in the Province since.

During the same period he also served as Chairman and Consulting Engineer for the Timiskaming and Northern Ontario Ry. Commission. In 1907 he retired from both commissions and established the firm of Smith, Kerry & Chace, consulting engineers, etc., of Toronto. As senior member of this firm he had the supervision of planning and constructing some of the largest hydro-electric power plants in the Northwest, among them the 60,000 h.p. development on the Winnipeg River, near Winnipeg, Man.; the 19,000 h.p. plant for the Calgary Power Co., on the Bow River in Alberta; the 24,000 h.p. development of the Mount Hood Ry. & Power Co., near Portland, Ore., and the 15,000 h.p. plant on the Snake River in Idaho for the Crane Falls Power and Irrigation Co. He served these enterprises not only in an engineering capacity, but largely directed their organization and financing. In this connection he served as president, manager or vice president of several of these large development companies.

He was ever active in promoting the welfare of his profession and was a member of the Institution of Civil Engineers of Great Britain, of the Canadian Society of Civil Engineers, of which he was a member of the Council and a past Vice President; the American Society of Civil Engineers, the Engineers' Club of Toronto and the Oregon Society of Civil Engineers.

He was one of the busiest of men, and his early death may perhaps be attributed in some degree to the pressure under which he worked, taking him back and forth across the continent many times in the course of a year. It was a well considered plan of his to retire to a strictly consulting practice as soon as the last of the great works which he had under way was completed; but apparently he had miscalculated his strength and was denied the termination for his career, which he had so earnestly desired.

He is survived by a widow and two sons.

The Section Foreman Problem.

By P. J. M. Woslyng, Roadmaster, C.P.R., Lethbridge, Alta.

I would advise the following measures to improve the situation facing us regarding the scarcity of good section foremen:—

1. Give the section men a fair and square deal. Let them understand that they are just as important as any other class of railway employes and show them that it is recognized that their service is important.

2. Pay all regular laborers the highest local laborers' wages, so that they will be encouraged to remain and work steady on the track.

3. The foreman should show his men how to do different kinds of work, and explain whenever convenient why it should be done in such a way. When a laborer is far enough advanced, give him a show to do different kinds of track work under the foreman's supervision, and if he does wrong, the foreman should be prompt to rectify him. Before he gets any promotion, move him to some section, in a yard, or extra gang, where some heavy work is going on under a good practical foreman; and let him work long enough to get familiar with heavier work than he would be able to practice on an ordinary section.

4. When the roadmaster calls a meeting of his foremen to discuss track work, the men that are nearest in line for promotion should, if possible, be present and be encouraged to take an active part.—Railway Age Gazette.

Canadian Car Service Bureau.—At the annual meeting in Montreal July 11, representatives of the Canadian Pacific, Central Vermont, Grand Trunk, Quebec Central and Toronto, Hamilton and Buffalo Railways were re-elected members of the executive board. M. Magiff, Superintendent Telegraphs and Car Accountant, Central Vermont Ry., was re-elected Chairman. The Manager is J. E. Duval.

Brockville Roundhouse.—We are officially advised that there is no foundation for the press report referred to in our last issue, stating that work was about to be started on an addition to the roundhouse at Brockville, Ont.

L. J. Papineau has been appointed Supervising Engineer of the power development works in course of construction by the Dominion Public Works Department, on the St. Lawrence river, in the vicinity of Montreal.

L. D. Oakley has been appointed Line Auditor, Western Lines, Dominion Express Co., for the inspection of offices west of, and including, Port Arthur, with office at Winnipeg; J. Richardson, Line Auditor, Eastern Lines, continuing the inspection of offices east of Port Arthur, Ont., with office at Toronto.

Grand Trunk Terminal Warehouse Co., Ltd.

A company with this title has been incorporated under the Dominion Companies Act, with a capitalization of $10,000,000 (1st mortgage, 30 year sinking fund bonds), of which $5,000,000 are issued, and $6,500,000 are issued. The bonds which $5,500,000 are issued. The bonds have been offered to the public at 95 with a bonus of 50% of common stock.

In view of the appreciable benefit to be derived by the railway companies from the establishment of the proposed warehouses, the organization of the G.T.T. Warehouse Co., has been carried through with the co-operation of the Grand Trunk and G.T. Pacific Railways, and the Warehouse Company has secured an operating contract with these railways, extending over 30 years. The railway companies undertake to provide sites for the establishment of the company's warehouses at various points, at nominal rentals, during the first period of the leases, and for the balance of their term at extremely low rentals.

The ultimate policy of the company is to provide warehouses at all the important commercial distributing centres in Canada, such plants to be situated upon, or accessible to, the lines of the G.T. and G.T. Pacific Railways, and their subsidiary companies. Plans have been prepared for the acquisition of property and the construction of warehouses at Montreal, which will give the company available warehouse space of 465,000 sq. ft. A warehouse will also be immediately established at Toronto; construction will be begun in the various other cities so soon as the question of location, capacity and other details finally decided upon. The warehouses will be of the most modern fireproof construction, and the most up to date labor saving devices will be installed. Cold storage facilities will also be installed at certain points.

As before stated, it is proposed to provide at Montreal warehouse buildings which will have a total rentable space of 465,000 sq. ft. This figure is arrived at after making conservative allowance for that portion of the total space which will be occupied by elevators, posts, passageways, heating, etc.

The income which the company will derive from the rental of this space for warehousing and storage purposes is estimated at 60c. per sq. ft. per annum, thus giving annual gross receipts of..		$279,999.00
From this is deducted the total expenses of operating the warehouses, including taxes, heating, labor, office and other general expenses, which will not be in excess of 15c. per sq. ft. of rented space or		69,750.00
Leaving an annual net revenue of		$209,250.00
It is estimated that for the construction of the Montreal buildings, and the purchases of the land, bonds will require to be issued to the amount of..	$1,500,000.00	
With the issue of a total $5,000,000 of bonds, and the construction of additional warehouses at Toronto and other Western points, the net revenue of the company would be proportionately increased, and based on the above estimate would be	697,500.00	
Deduct:—		
Interest on $5,000,000 bonds .....$	300,000.00	
1% sinking fund	50,000.00	
		$350,000.00
Leaving a total amount applicable on the common stock of		$347,500.00

Or at the rate of over 6% per annum.

The directors are W. Wainwright, J. E. Dalrymple and R S. Logan, three of the G.T.R. Vice Presidents; J. N. Greenshields, President, Quebec Savings and Trust Co., and G. Bird, General Manager, International Bank.

Electric Railway Department

The Halifax Electric Tramway Co. and its Employes.

The employes of the Halifax Electric Tramway Co., after a series of meetings, recently forwarded to the company a schedule of wages, etc., which they desired the company to adopt, and a list of alleged grievances for adjustment.

The proposed wage schedule called for the rates to be as follows: First year, 21c. an hour; second year, 23c.; third year, and over, 25c.; snow work, 30c.; and awaiting orders, at regular car time; Sunday work and overtime, time and a half; for instructing new men, one day's pay in addition to time taken by instruction; wages to be paid once in seven days; uniforms, men to pay half cost for the first year, company to provide them free thereafter, suit once a year, overcoat every second year. For the shed men, the rates asked were as follows: Motor and truck repair men, first year, 21c.; second year, 23c.; third year, 25c.; armature winders, first year, 21c.; second year, 23c.; third year, 25c.; car cleaners, 21c. an hour; snow work, 30c. an hour.

The rates hitherto paid motormen and conductors were first year, 18½c.; second year, 19½c.; third year, 20c.; fourth year, 21½c.; fifth year, 21c.; sweeper time, 22c. an hour. The men paid half cost of uniforms up to five years, after which the company provided them free.

The company agreed to pay the following rates, beginning July 1: First year, 20c.; second year, 21c.; third year and up, 23c.; sweeper work, 25c.; Sunday work, full week-day time, and to provide uniforms free after three years service, the men to pay half cost up to three years.

The extra pay would amount to about $5,500 a year, which follows an advance of about $6,000 made in November last.

This does not appear to have been satisfactory to the men, as at a meeting on July 12, they decided to apply for the appointment of a conciliation board, under the provisions of the Industrial Trades Disputes Act, and named J. T. Joy, President, Trades and Labor Council, as their representative.

The General Managership of the Montreal Tramways Co.

James E. Hutcheson, heretofore Superintendent and Purchasing Agent, Ottawa Electric Ry. has been appointed General Manager, Montreal Tramways Co., to succeed Duncan McDonald, who has resigned in order to attend to his many important personal interests.

Mr. McDonald has opened an office at 526 Transportation Building, Montreal, and the various interests with which he is connected will be managed from there. Among these are the Montreal Tunnel Co., the Prepayment Car Sales Co., of which he is President, and which controls the pay-as-you-enter car, of which he is one of the patentees, and also the pay-within car. He is also a director of the Dominion Park Co., Montreal, of which he was one of the principal founders. He was born at St. Thomas de Montmagny, Que., June 17, 1859, and removed to Montreal in 1875. He entered Montreal St. Ry. service in 1881, as a driver, in order to acquire a thorough knowledge of street railway work from its very commencement. He was soon changed to conductor, and after about a year in that capacity, was appointed roadmaster. In 1886 he severed his connection with the company, and engaged in other business. Anticipating the progress that the trolley system would make, he went to St. Paul and Minneapolis, Minn., in 1889, and secured a practical knowledge of electric railways. He returned to Montreal in 1892, and re-entered Montreal St. Ry. service as inspector, and in 1894 was appointed Superintendent of Transportation, which position he held until 1898,

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Duncan McDonald.

when he resigned to become General Manager, Parisian Tramway Co., with headquarters in Paris, France, in which position he organized the Parisian system to a high degree of efficiency. In 1903 he returned to Montreal, having been offered the position of Manager, Montreal St.

P295 James E. Hutcheson.

Ry., which position he held to Nov. 1910, when he was appointed General Manager, and on the recent reorganization of the company, under the name of the Montreal Tramways Co., he was appointed General Manager of the new company. He is a director of the Automobile Club of Canada, a member of the Civil Engineers' Society of France, a member of the Institute of Electrical Engineers, Eng., and has been connected with the Canadian Street Railway Association since its inception, having been President for two years, 1909-1910 and 1910-1911, and is still a member of the executive committee.

J. E. Hutcheson was born at Brockville, Ont., Sept. 15, 1858, and entered railway service in 1874, in the G.T.R. mechanical department, afterwards serving in that company's ticket, freight and telegraph departments. In 1884 he was appointed a dispatcher, C.P.R., at Ottawa, in 1886 Chief Dispatcher and in 1888 Trainmaster, which position he held to 1891, when he took charge of the Ottawa Electric Ry. Co.'s operation. He has taken an active part in the Canadian Street Railway Association's work since its inception, having served continuously as a member of the executive committee, and also having been Vice President, and for the year 1908-09, President. He was, for several years, a member of the 43rd. Regiment, retiring with the rank of Major, in 1910, on his return from England, where he acted as Adjutant in charge of the Canadian team at Bisley.

The Toronto Railway and its Employes.

As the result of negotiations between the company and its employes, an agreement was signed, July 3, outlining the terms of employment to June 16, 1915, the terms offered by the company being accepted by the men, as a compromise. There is to be an increase of 2½c. an hour, all round, and 4c. an hour extra will be paid for Sunday work. Shedmen are to receive a half holiday on Saturdays. The first year men are required to pay full cost of the first uniform. The men will pay half the cost of the second, and further uniforms will be provided free by the company.

The old rate of wages was, for first year men, 21c.; second year, 23c.; third year, and up, 25c for motormen and conductors; for shed men, foremen, 25c; assistants, 22c.; car washers, 21c.; motor and truck repair men, 21c.; second year, 23c.; third year 25c.

It is stated that the increase in wages will absorb about $130,000 a year.

Montreal Tramways Mutual Benefit Association.

The report for the year ended Apr. 30, shows that during the year there were 1,173 members disabled through sickness and injury; 626 visits made by doctors; 7,587 consultations; 5,811 prescriptions issued; $10,274.10 paid for sickness and injury, $1,725.95 for medicine; $354.50 for pensions; $296.31 for withdrawals and $12,533.35 for death and burial insurance. There were 29 deaths during the year. An act amending the association's charter was passed, changing the name from the Montreal Street Railway Mutual Benefit Association. The annual picnic resulted in a profit of $8,149.20. The management committee reported a special Christmas donation to the funds of $4,000 from the company, making the total contributions received from the company, $18,915.61, which, added to the fees and dues from the members, $15,812, and the proceeds of the picnic, interest, etc., $12,926.49, makes the total revenue for the year, $47,654.10. The expenses being $34,939.32, there is a surplus of $12,714.78.

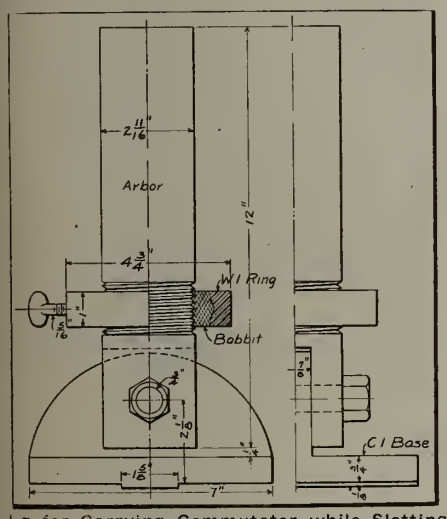
Sale of Dominion Power and Transmission Co. Not Carried Out.

The proposed sale of the Dominion Power and Transmission Co.'s properties, in and around Hamilton, Ont., including the Hamilton St. Ry. and four radial electric railways to Sir Wm. Mackenzie and his associates, which was referred to in Canadian Railway and Marine World for July, has not been carried out, and parties on both sides of the transaction say that the negotiations are off.

Commutator Slotting Jig at Halifax Electric Tramway Company's Shops.

At the Halifax Electric Tramway Co.'s shops, D. B. Logan, Foreman Machinist, a method of slotting the armature coil wire lead slot in the commutator segments, has been devised. A lathe is employed for the purpose in conjunction with the jig shown in the accompanying illustration.

The jig is bolted on the tool post of the lathe carriage. Over the vertical arbor, the dismounted commutator is slipped, the diameter of the arbor corresponding to that of the commutator bore. A milling cutter saw, on a mill-



Jig for Carrying Commutator while Slotting in the Lathe.

ing arbor held in the lathe spindle, is made to revolve at a high velocity, cutting the slots in the commutator, which is fed up to the cutter by the tool carriage.

The construction of the carrying jig is interesting. To the vertical flange of the cast iron base, which is made to fit the tool post stand, there is attached an arbor, the lower end of which is slotted to fit over this flange, a ¾ in. bolt holding the two together. This construction allows for the arbor being inclined from the perpendicular when in service, as will be explained further on. On this arbor there is a wrought iron ring or collar, adjustable within limits along the arbor, on which the mounted commutator rests. The method of attaching the ring to the arbor, in order that it might be adjustable, is rather unique. Were the ring itself threaded, the arbor would of necessity have to be threaded from its lower end up to the section now required; that is, the carrying bolt section would be threaded. To obviate such a design, the unusual construction followed became necessary. The ring, set true with the arbor, was blocked up from its lower surface, and the annular recess thus formed between the ring and the arbor thread poured with molten babbitt. This formed a perfect internal thread in the supporting ring, allowing the necessary lengthwise adjustment on the arbor without threading the arbor from the bottom up to that point.

The jig in operation is mounted on the tool post stand, with its swing adjustment in a plane at right angles to the lathe centre line. The arbor, swung over at an angle towards the centre line, carries the commutator dismounted from its carrying shaft. It is set in such an angle and position that when it is moved across against the cutter by the carriage cross screw, the cutter strikes the corner that is to be slotted for the entry of the coil connecting wires. The commutator is set by hand in the positions for slotting each sector independently, and there held during slotting, being then swung over to the next sector.

Electric Railway Notes.

The first pay-as-you-enter cars to be operated in Great Britain, have been put into service at Gateshead, Eng.

G. E. Wadland, heretofore Treasurer, Sarnia St. Ry., has also been appointed Manager and Secretary vice H. W. Mills, deceased.

The Guelph Radial Ry. is reported to be in the market for a snow sweeper, for delivery in time for use during the coming winter.

The Regina Street Ry. has received four single truck, pay-as-you-enter cars, from the Preston Car and Coach Co., Preston, Ont.

The Sarnia St. Ry., Sarnia, Ont., is building a car barn and machine shop of concrete blocks, with gravel roof. The cost is reported as about $12,000.

Superintendent Mickle of the Kingston, Portsmouth and Cataraqui Ry., Kingston, Ont., recently announced that cars would be run on Sundays only in very warm weather.

The Dominion Power and Transmission Co. has received three suburban cars, for its radial lines out of Hamilton, Ont., from the Preston Car and Coach Co., Preston, Ont.

The Moose Jaw Electric Ry. has put a Sunday car service in operation on its lines in Moose Jaw, Sask., following the recent vote of the citizens granting the right to do so.

One fatal, and one non-fatal accident were reported during May, in connection with the operation of electric railways in Canada. The death was due to a car motor falling on a man.

F. D. Powers, heretofore freight traffic expert for the Vancouver board of trade, has been appointed Freight Traffic Agent, British Columbia Electric Ry., with office at New Westminster.

The Quebec Court of Appeal has dismissed the appeal of the Montreal Street Ry. against the decision of the Recorder's Court fiining the company $25 for carrying freight on its lines in the city.

The Calgary Municipal Ry. has received one double truck sprinkler, one scenic car, and one single truck car, completing an order of 12, from the Preston Car and Coach Co., Preston, Ont.

Members of the street railway committee of the St. Thomas, Ont., city council, visited various cities in the U.S. recently, for the purpose of inspecting types of street cars, and their method of operation, with a view to a betterment of the municipal street railway system. It is stated that the pay-as-you-enter cars are favored, and quotations are being received.

J. B. Ingersoll, who has been engaged for some time past as electrical engineer on the British Columbia Electric Ry. Vancouver, B.C., is reported to have left that company's service to become manager of the Kootenai Power and Construction Co., which is building a 40,000 h.p. hydro-electric plant at Kootenai Falls, Montana, with a transmission line of 170 miles.

It has been decided t appeal against the decision in the action of Kerley, against the London and Lake Erie Ry. and Transportation Co. to recover penalties for the operation of cars on Sundays between London and Port Stanley, the full text of which was given in our last issue, pg. 365. Pending the hearing of the appeal, Sunday traffic on the line has been suspended.

As a result of a conference between the Winnipeg board of control and the directors of the Winnipeg Electric Ry., July 5, following a number of previous conferences, it is said that an arrangement has been made relative to all points in dispute between the city and the company, and that an official announcement of the settlement will be made when all the detailh have been worked out.

The question whether the decision in the action of Kerley against the London and Lake Erie Ry. and Transportation Co., as to the operation of cars on Sunday, affects the Brantford and Hamilton Ry. is being considered by the latter's management. The city clerk of Hamilton has advised the city council that the decision only affects companies whose lines have been built and brought into operation since 1897.

J. D. Burpee, Accountant, Ottawa Electric Ry., has been appointed Superintendent and Purchasing Agent, vice Jas. E. Hutchinson, resigned to enter Montreal Tramways Co.'s service. He was born at Ottawa, Apr. 25, 1876, and commenced railway work in 1891 under H. B. Spencer, Superintendent, District 4, Eastern Division, C.P.R., Ottawa. He entered Ottawa Electric Ry. service in 1893, since when he was, to 1896, stenographer; 1896 to 1898, cashier and paymaster; 1908 to 1912, Accountant, during which time he also acted as assistant to the Superintendent and Secretary.

S. D. Egan, whose appointment as Superintendent, Regina Municipal Ry., Regina, Sask., was mentioned in our last issue, was born at Auckland, New Zealand, Sept. 23, 1866, and received training at the Government School of Engineering, Chatham, Eng., where he qualifieo class first, as mechanical engineer, land and sea, and gold medallist for general knowledge construction and operation of steam and electric railways. He has had a varied railway experience in Europe, Australia, Egypt, the Soudan, Jamaica and Africa, having served on the Cape to Cairo and Rhodesian railways, both in construction and operation. He has been in Canada about six years, and has served, at various times, on the C.P.R., Mackenzie, Mann and Co., Ontario Government, city of Toronto, and as expert for the Board of Railway Commissioners.

Advantages of Electric Locomotives.—A recent paper on electric locomotives for the handling of freight in railway yards and in mining, brought out clearly certain advantages over steam locomotives apart from the elimination of fire and smoke and the difference in fuel efficiency of the central station boiler and engine and the (smaller) locomotive boiler and engine. The electric locomotive can be relied upon, as long as the line voltage is maintained, to develop its full power at any time, being independent of the state of a boiler, the skill of a fireman, or the quality of fuel. The track adhesion is better—sometimes as much as 20% better—because the torque of the driving wheels is uniform throughout each revolution, and there is not the same tendency to slip when starting under load as in the steam locomotive. The traction can be increased indefinitely by sanding the rails, since the electric locomotive can draw power indefinitely from the line. No time is lost on the road for coaling, watering, boiler tending, or waiting for steam pressure to rise.

Car Equipment with Reference to Safety Devices.

By A. E. Beck, Claims Agent, British Columbia Electric Railway.

"It must be made difficult for employes to cause accidents or for the public to meet with them," is a good rule for the management of railway corporations to ever have in the mind's eye. It is not just to hold a railway corporation or any person wholly responsible for that which could not be wholly prevented, but there are negligent acts on the part of both the carmen and the public which, although frequently present, are preventible and for which we must find a cure without recommending quack remedies. Success has attended our efforts in the educational field, such as "barn" talks to the men, addresses to school children, warnings to passengers by placards and press notices, etc., but our experience teaches us that some measure of physical restraint is also necessary to protect ourselves and the thoughtless or heedless. Already we have minimized the attacks of our adversary, as is shown by a constantly decreasing casualty list.

Inside Hung Brake Rigging on Hull Electric Co.'s Cars.

While it is true that public safety must be recognized as of primary importance, it is also true that attention must be paid to certain economics of car building to prevent the car being equipped with safety devices to such an extent as to make both operator and car in danger of being overburdened by a bundle of mechanical absurdities.

Well directed efforts have been made to so construct the car itself that, structurally, it will conduce to public safety, and these attempts have brought forward many types of cars, each having its own champions. Steam railways have almost universally accepted a standard car pattern and perfection in this line appears to have been about reached, but we yet await the perfectly constructed street car. Is the standard street car an impossibility? Will the time never come when the man on the street will be as familiar with the structure and safety equipment of a car in Los Angeles as in New York or elsewhere? The provision of such a standard car would be a very desirable factor, as in its construction could be embodied the results of our concentrated endeavors for the prevention of accidents.

The more serious accidents happen at the front end, where they are most difficult to prevent, the time for action being but a brief moment, and the danger occasioned by a cause beyond the control of the motorman. Here we must endeavor to lessen the severity of the impact and prevent mutilation.

The accidents at the rear end are more numerous than any other class. Street car passengers insist on freedom of entrance and exit and rebel against forcible restriction. If people would not get on or off a car while it is in motion our work would be greatly lessened, but that is just what they will do despite our many efforts to warn them, and in their rashness and haste they are all too frequently assisted by the too impetuous conductor or motorman.

Where the summer car is so much used, both summer and winter on this coast, and where doors, gates and folding steps are not provided, an answer must be given to (one foot on the step and the car started)—"Why did you not tell me the car was about to start?"—and similar queries. The writer suggests the installation of an electric bell, operated by either the motorman or conductor by means of a push button and ringing simultaneously at the front and rear of the car, at the points of entrance and exit. This would serve to warn passengers and also provide for the "proceed" or "stop" signal to the motorman. By this means the motorman could signal the approach of a passing car and provision is made for warning those waiting to board a car which is already overloaded as well as the person who approaches the car unobserved from side or rear, as is frequently the case, after the "proceed" signal has been given. With such a system of warnings carried out, parties knowingly assuming the risk of accident would be the authors of their own misfortune in case of mishap. Even in the event of the allegation by the injured person that the warning was not heard the fact that it had been given would be susceptible of proof by others as to the actual occurrence.

"Was the whistle blown before the accident?" and "Was the door opened before the car came to an actual stop?" are recurrent questions which indicate that we must protect ourselves from ourselves; that we must equip our carmen, both mentally and mechanically, by lectures and actual tests in the proper use of safety devices so as to make it difficult for accidents to occur. But we must not overburden the men who have already "too much to do," as they, as well as the public, chafe under the yoke of restriction.

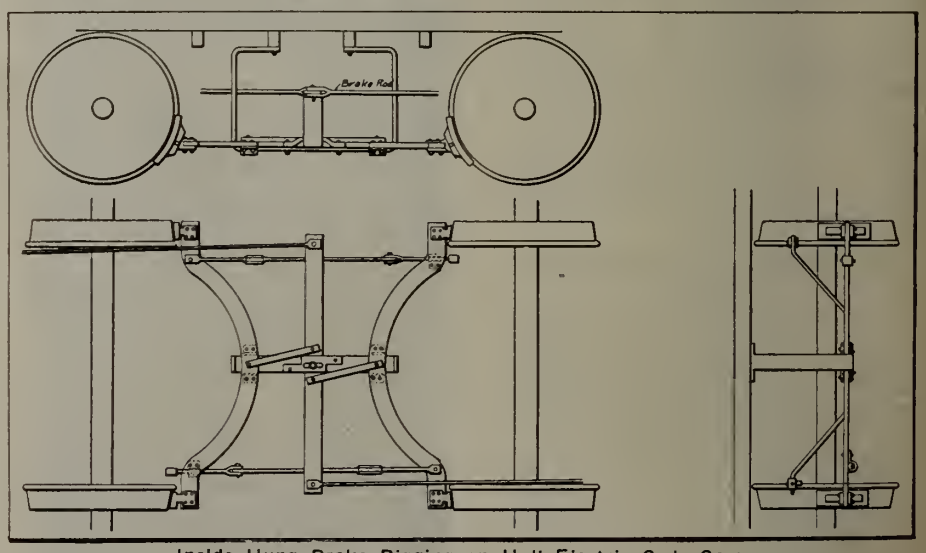
Our work of protection should include the "higher ups" as well as the men, the principles of the doctrine of public safety being preached constantly to the superintendents.

The foregoing is an abstract of a paper read at the Pacific Claim Agents' Association's convention at Los Angeles, Cal., recently.

Inside Hung Brake Rigging on Hull Electric Company's Cars.

The brake rigging of the Hull Electric Co.'s cars, which operate between Ottawa and Aylmer, Que., has been considerably altered from the form it takes on leaving the car works. The outside hung rigging so generally used, was found by this company to be rather cumbersome, constantly becoming clogged up in rough weather from its exposed position outside of the wheels. An inside position was deemed preferable, with the result that the inside hung brake rigging shown in the accompanying illustrations was designed. Several of the company's cars have had this new rigging applied, and it is reported that the results attending their use have been most satisfactory, both from an operation and a maintenance standpoint.

The construction, which is much simpler than that of the outside hung type, consists of a very few simple parts, and is clearly outlined in the line illustration.



Inside Hung Brake Rigging on Hull Electric Co.'s Cars.

Western Canada Power Co.—W. McNeill, Assistant Manager, W.C.P. Co., stated at a public meeting in Burnaby, B.C., July 16, that contingent upon certain negotiations in progress with the Provincial Government, the company would start construction upon the projected electric railway through North Burnaby by the fall. The matter under discussion was as to the cost of the bridge across the Pitt River, and a decision was expected by the end of August.

Electric Railway Projects, Construction, Betterments, Etc.

Berlin and Northern Ry.—The Berlin, Ont., city council has under consideration a proposal to contribute $6,000 towards the erection of a new bridge across the Grand River at Bloomingdale, on the projected extension of the old Berlin and Bridgeport Electric Ry. from Berlin to Bloomingdale. W. H. Breithaupt, Berlin, Ont., is President. (June, pg. 308.)

Brandon, Man.—Certain of the aldermen desire that no double track lines be built at present, but single lines only, so as to serve a greater area. The routes at present proposed with double track on Tenth St., are under construction, and the city engineer wants a decision to be reached so that he may go on with tracklaying and have the lines in operation at the earliest possible date.

The city engineer has been authorized by the city council to order 100 tons of 70 lb. rails, and 500 tons of 60 lb. rails. (July, pg. 367.)

British Columbia Electric Ry.—R. H. Sperling, General Manager, in an interview, July 5, is quoted as stating that the company is quite willing to reopen negotiations with the transportation committee of Greater Vancouver, in respect to its various franches. The company will not withdraw any of the offers it had made, and on the other hand, it has no further proposals to make either to Vancouver or the several other municipalities interested. A good deal will depend on the decision of the Imperial Privy Council in the appeal on the Point Grey franchise question, which it was expected would be given in November.

Track has been laid on the Highland Park cutoff to near Edmonds, and the whole line is expected to be ready in the fall.

Plans are being prepared for the erection of car barns on the Kitsilano reserve, and for the erection of additions to the shops in New Westminster. (July, pg. 367.)

Hamilton, Waterloo and Guelph Ry.—The Hamilton, Ont., city council passed a resolution, July 2, granting an extension to Oct. 1, of the franchise for this line, held by J. Patterson. At a meeting of the board of control June 30, Mr. Patterson and the company's engineers were present. It is estimated that the lines which the company proposes to build under its charter, which includes a line to Toronto, will cost $12,000,000, although it is possible this might be reduced to $9,000,000 through savings on the right of way. It is desired that local interests should subscribe one-third of the capital. The extension of time was given to see what could be done in this direction. The International Bond and Share Co. of New York, is looking after the financing, and the McArthur Construction Co., of New York, made the estimates for construction. A subsequent press report states that the International Bond and Share Co.'s representative who went to England in connection with the project says the required capital cannot be obtained there. (June, pg. 308.)

International Ry. (British Columbia).—Application is being made by the company for a license to store 5,000 ft. of water in the Fraser River above Yale, B.C., for power purposes. The company contemplates building an electric line through the lower mainland connecting New Westminster with Ladner, thence through Delta and Surrey, B.C., to Blaine, and Huntingdon, Wash. H. T. Thrift, Hazlemere, B.C., is Secretary. (May, pg. 251.)

Lake Erie and Northern Ry.—A bylaw to subscribe $125,000 of debenture stock in the company was approved by Brantford, Ont., ratepayers, June 25. On July 9, the ratepayers of Simcoe and Port Dover approved of bylaws subscribing $25,000 each to the project, and July 11, the Galt town council decided to submit a bylaw subscribing for a similar amount. The town of Paris has also a similar bylaw under consideration.

W. P. Kellett, Managing Director, is quoted as stating that tenders will be asked for the construction of the line early in Aug. (July, pg. 367.)

Lethbridge Municipal Ry.—H. Doughty is quoted as saying that nine miles of track had been laid on the municipal electric railway in Lethbridge, Alta., to July 1, and that it was expected to have the tracklaying completed by Aug. 1. Superintendent Reid returned from the United States, July 10, from a trip purchasing machinery, etc., for the line, and it is hoped to have the line in operation by Aug. 31. (June, pg. 310.)

London and Lake Erie Ry. and Transportation Co.—Representatives of the Yarmouth, Malahide, Aylmer and St. Thomas municipalities have agreed to submit bylaws to provide for guaranteeing the company's bonds for $15,000 a mile for the 10 miles of line between St. Thomas and Aylmer, Ont., on condition that the line will be extended to Port Burwell within three years. Aylmer, however, limits its guarantee at present to $25,000. (July, pg. 367.)

London St. Ry.—Work is reported to have been started on the new north end line, which it is expected to have in operation by Jan. 1, 1913.

AN ELECTRIC RAILWAY EXPERT'S VIEW.

J. E. Hutcheson, who has been appointed General Manager, Montreal Tramways Co., has been a subscriber to this paper for a number of years, so that his opinion in regard to it is of interest and value. It is clearly expressed in the following letter:—

"I wish to say that I have found The Railway and Marine World the most useful periodical published in the interests of the railway business. The reading matter is live and very interesting, and is so arranged as to make the paper a very valuable advertising medium. Railway officials who cannot find time to read your monthly are missing something. I wish you continued success."

Montreal and Southern Counties Ry.—The Minister of Railways has approved of the route map for the proposed line from Ranelagh to Laprairie, Que., four miles.

Press reports state that location surveys for the line to Granby have been completed and that it is expected construction will be started at an early date.

A contract is reported to have been let to the Canadian Westinghouse Co., for electrical equipment for the new power house, including three 500 kw. rotaries, six-phase, 60 cycle, 900 r.p.m., 600 volts d.c.; one 400 kw. motor generator set, 720 revolutions, generator 600 volts, motor 2300 volts; the necessary transformers, and ten quadruple 50 h.p. motor car equipments, with multiple unit electric pneumatic control for operating cars. (July, pg. 367.)

Montreal Tramways Co.—Press reports state that the directors have practically completed their plans for the improvement and extension of the various lines. The plans are said to include the building of a second track on the Bout de l'Ile line, and a number of extensions out of the city, and particularly to the summer resorts along Lake St. Louis. (June, pg. 309.)

Moose Jaw Electric Ry.—Work was started July 1, on the extension to the proposed park. President Dion in notifying the city council of the extension, said: "This is the only extension that has been decided upon, and if the statements are made that we are building extensions in other directions they are not authorized by us, and are not correct." (July, pg. 368.)

Niagara, St. Catharines and Toronto Ry.—It is expected that the projected line from St. Catharines, Ont., to Niagara on the Lake, about 14 miles, will be gone on with at an early date, and that it may be completed this year. The Minister of Railways has approved of the route map. The line will branch off from the present line at Niagara St., St. Catharines, and proceed along that street to Carlton St., turning north about half way to the projected line of the new Welland canal, and proceeding as far as the Lake Shore road, about a mile inland. which will be followed to Fort Mississauga, and thence to the wharf, at Niagara on the Lake. The plan also shows a spur line along Carlton St. to lock 2, and a branch to the proposed new port at the Lake Ontario entrance of the new Welland canal.

The Minister of Railways has approved of a route map of a line from near Port Dalhousie to Beamsville, Ont., about 12 miles, but it is hardly likely that it will be built this year. The map shows a line branching off from the present line, where it strikes east along the main road into Port Dalhousie, and proceeding in the opposite direction skirting the lake shore to Jordan, thence striking directly across to Beamsville, where connection would be made with the Hamilton, Grimsby and Beamsville Electric Ry.

Niagara, Welland and Lake Erie Ry.—C. J. Laughlin, General Manager, Welland, Ont., is quoted as stating that the company will have a line in operation by the end of the summer along the east side of the canal from Welland to Port Colborne, Ont. (July, pg. 368.)

Nipissing Central Ry.—The Minister of Railways has approved of a route map for the extension of the line from Haileybury to New Liskeard, Ont., 5.5 miles. (June, pg. 359.)

Ottawa, Rideau Lakes and Kingston Ry.—T. R. Clougher, London, Eng., and H. E. Upson, Ottawa, made an inspection of the route of this projected railway from Ottawa to Kingston, Ont, early in July. Mr. Clougher is quoted as stating that with the exception of 20 miles at the Kingston end the line would be an easy one to build and that the company was arranging for the financing of the line, and that he expected construction would be started early in 1913. (June, pg. 309.)

Port Arthur and Fort William Electric Ry.—The utilities committee of the Port Arthur, Ont., city council, had the city engineer's plans for the projected belt line to connect with the main line and the Arthur St. extension in that city, before it, July 5. The committee recommended the council to approve of the same, and to prepare a necessary bylaw for submission. The route recommended was not made public. (July, pg. 368.)

Regina Municipal Ry.—The Regina, Sask., city council has under consideration a proposition from a group of real estate men who offer to build a six mile line to open up new territory, and hand it over to the city. The council has asked the promoters to submit proposals for the operation and maintenance of the line pending the development of the property.

Considerable damage was done to the overhead work, and to the car barns, etc., by the cyclone which struck the city on June 30. (April, pg. 197.)

St. Thomas St. Ry.—The city engineer has been directed by the St. Thomas, Ont., city council to prepare an estimate for extending the city's electric railway from Hemlock St. to Pinafore Park, and for putting the track now laid in the park in a condition for traffic. (July, pg. 368.)

Sarnia St. Ry.—Owing to a fire at the plant of the Sarnia Electric Light Co.,

June 28, the street railway service had to be suspended. The S.S. Ry. secured a generator and a steam engine from the Detroit United Ry., and was able to resume its car service July 10. (April, pg. 197.)

Saskatoon, Sask.—Only one vote was cast recently against the project to build an electric railway in Saskatoon, Sask., as a municipal enterprise. The bylaw authorizes the expenditure of $500,000 on the line, and the routes to be followed are to be practically the same as those laid out by H. M. E. Evans, under the charter given the Saskatoon Electric Ry. and Power Co., which was abandoned. The financing is being arranged through Stone and Webster, Boston, Mass., the construction being in charge of city engineer Locke, with O. A. McCormick, formerly general foreman of construction on the electric railway at Seattle, Wash. Construction was started July 1, and it is expected to have the first section of the line in operation by Nov. 15. (June, pg. 310.)

Toronto and York Radial Ry.—The order authorizing the diversion of the Metropolitan Division to a private right of way from Farnham Ave. to a new terminal near the C.P.R. tracks, North Toronto, was issued June 26; and the company started clearing part of the site July 1. The city has notified the company of its intention to appeal against the order, and this will be dealt with when the courts resume in September.

The taxpayers voted against a bylaw to permit the double tracking of the line on Yonge St., within North Toronto municipality, and in favor of the bylaw to merge the municipality in the city of Toronto. (July, pg., 368.)

Toronto Eastern Ry.—The Board of Railway Commissioners has approved of revised location plans for the line through Pickering tp. Ont.

This line is under construction from Bowmanville to Toronto, together with a branch line into the town of Oshawa, Ont. The general contractor is Gowan Mackenzie, Toronto, who has sublet the grading to the following: Wm. Yule, Bowmanville; Victoria Construction Co., Toronto; Robert Hill, Oshawa; E. Cook, Oshawa; and C. H. Cook, Whitby. The contract for fencing has been let. (July, pg. 368.)

Toronto Suburban Ry.—The first of the extensions of this line to be placed under construction is that from Weston to Woodbridge, Ont. The location is along private right of way, and the contract is being carried out by Ewen Mackenzie, Toronto. The general contractor's own outfit is working on a section of the line, and the grading on the balance has been sublet to S. O'Connor, Woodbridge, and W. Joplin, Woodbridge. The fencing contract has also been let. About half the grading has been completed, and it is expected to have the work completed early in September.

The line to Guelph is also under construction, the general contract having been let to Ewen Mackenzie, Toronto. This line is being built on a private right of way, and starts from the present Lambton line in the park there. It will cross the Humber River a little south of the C.P.R. bridge. The bridge to be built there will be large enough to be also used by the Canadian Northern Ry. line to Niagara Falls. The location from this point is parallel with Dundas St., partly on the north and partly on the south, through Islington, and Summerville, going down to the C.P.R. tracks just west of Dixie station, and keeping alongside of the C.P.R. as far as Cooksville station, where it turns northerly, and proceeds in nearly a straight line for Meadowville, thence through Churchville, Huttonville and Norval to Georgetown. Thence it parallels the G.T.R. to Acton and runs in a nearly direct line to Guelph, passing through Eden Mills. The exact location for the entrance into Guelph has not been decided. Surveys are being made for an extension from Guelph to Berlin, and it is intended later on to proceed with the surveys to Stratford, which city has given the Mackenzie, Mann & Co. interests a franchise under the charter of the Stratford Ry. The contract let to Ewen Mackenzie, covers the line to Guelph, and it is expected to have it completed this year. A sub-contract for grading on the eastern portion of the line has been let to W. Maher, West Toronto, and other grading sub contracts are being arranged. E. T. Wilkie, is Chief Engineer.

The Ontario Railway and Municipal Board has ordered the company to reconstruct the line on Bathurst St., and Davenport Road, and to pave between the tracks and for 18 ins. on either side, the work to be done under the supervision of the Board's engineer. (July, pg. 368.)

Winnipeg Electric Ry.—A permit has been granted for the erection of a 14 story building to cost $500,000, on the corner of Notre Dame and Albert streets, Winnipeg. Pratt and Ross are the architects, and the contract has been let to the Carter, Halls, Adlinger Co., Winnipeg. (June, pg. 310.)

Electric Railway Finance, Meetings, Etc.

British Columbia Electric Ry.—Gross earnings for May, $491,826; operating expenses $313,469; net operating earnings $178,357; renewal funds $37,935; net earnings $140,422; approximate income from investments $25,000; net income $165,422, against $398,437 gross earnings; $260,437 operating expenses; $138,000 net operating earnings; $29,770 renewal funds; $108,230 net earnings; $20,000 approximate income from investments; $128,230 net income for May 1911. Aggregate gross earnings for 11 months ended May 31, $5,251,343; aggregate net earnings including estimated income from investments, $1,836,830, against $3,839,170 gross and $1,464,709 net for same period 1910-11.

Brantford St. Ry.—The National Trust Co. sued the Brantford St. Ry. Co. recently to recover $125,000 and foreclosure of mortgaged premises in default. In the Trial Court at Toronto, July 18, Judge Kelly gave the following decision:— "On the opening of the trial, it was shown that on June 11, the defendant had paid to plaintiff all arrears of interest, and an undertaking satisfactory to plaintiff was given for payment of plaintiff's costs up to the time of such payment. A breach of the covenants did not entitle plaintiff to possession, or to have a receiver appointed. Their remedy is on the covenants themselves. Action dismissed with costs from the time of payment of the interest on June 11, the plaintiff being entitled to costs to that time."

Calgary Municipal Ry.—Passenger earnings for June, $54,318.77; miscellaneous earnings, $589.26; total earnings, $54,908.03; operating expenses, maintenance, etc., $32,058.38; net operating earnings, $22,849.65; contingent fund, interest, etc., $8,008.73; net profit, $14,840.92 against $31,526.35, passenger earnings; $844.60 miscellaneous earnings; $32,370.95 total earnings; $13,742.95, operating expenses, maintenance, etc.; $18,628 net operating earnings; $4,334.43, contingent fund, interest, etc.; $14,293.57, net profit for June 1911. Following are the operating statistics for June, revenue per car mile, 32.660c.: operating expenses per car mile 18.906c.; surplus per car mile 13.754.; cost of power per car mile 4.570c.; proportion of expenses to revenue 58.3%.

Cape Breton Electric Co.—Gross earnings for May, $28,577.95: operating expenses and taxes, $16,192.34; net earnings, $12,385.61: interest charges, $4,495.83; balance, $7,889.78; sinking and improvement funds, $1,206.66; balance for reserve, etc., $6,683.12, against $27,650.50, gross earnings; $15,471.54, operating expenses and taxes; $12,178.96 net earnings; $4,512.50 interest charges; $7,666.46 balance; $1,141.67 sinking and improvement funds; $6,524.79 balance for reserves, etc., for May, 1911.

Edmonton Radial Ry.—Revenue for April, $32,158, against $19,014 for April 1911. The number of passengers carried during April was 782,646, against 452,959 in April 1911.

London St. Ry.—Gross earnings, $25,755.40; expenses, $17,752.26; net earnings, $8,003.14; deductions, $2,371.25; net income, $5,631.89, against $24,501.91 gross earnings; $16,841.63 expenses; $7,210.28 net earnings; $2,375.49 deductions; $4,834.79 net income, for June 1911. Aggregate gross earnings for six months ended June 30, $141,809.05; expenses $101,502.05; net earnings $40,307; deductions $14,368.50; net income $25,938.50, against $127,801.83 aggregate gross earnings; $94,193.01 expenses; $33,608.82 net earnings; $14,269.34 deductions; $19,339.48 net income for same period 1911.

Moose Jaw Electric Ry.—The gross revenue for the first six months of operation. Sept. 4, 1911, to Feb. 29, is reported as $16,205, with an expenditure of $12,479. A meeting of shareholders was held at Moose Jaw, July 3, when it was decided to increase the capital stock to $1,000,000.

Nelson St. Ry.—Replying to the offer of the Nelson, B.C., city council, to give par for the stock of the company, payable without interest in twenty annual instalments, the company showed a disposition to accept the price, but asked for 3% on the deferred payments. At a subsequent meeting of the city council, an offer was made of $7,500 for the property and assets of the company to quote the words of the mayor, "lock, stock and barrel" in presenting the resolution.

Toronto Ry., Toronto and York Radial Ry., Toronto Power Co., and allied companies.—Gross earnings for May, $693,015; operating expenses, maintenance, etc., $342,545: net earnings $350,470, against $622,197 gross earnings; $304,378 operating expenses, maintenance, etc.; $317,819 net earnings, for May 1911. Aggregate gross earnings for five months ended May 31, $3,315,738; net earnings, $1,696,457, against $2,934,018 aggregate gross earnings: $1,471,281 net earnings, for same period 1911.

The gross receipts of the Toronto Ry. for June, were $444,598.91 against $401,185.88 in June 1911. The percentage paid to the city for June, was $88,919.70.

Winnipeg Electric Ry.—Gross earnings for May, $298,743; operating expenses, $162,364; net earnings, $136,379, against $295,779 gross earnings; $149,699 operating expenses; $146,080 net earnings, for May 1911. Aggregate gross earnings for five months ended May 31, $1,508,300; net earnings $690,817, against $1,576,252 aggregate gross earnings: $761,488 net earnings, for same period, 1911.

Scenic Railway at Vancouver.—A new plan for the construction of a scenic railway up Grouse Mountain was submitted to the North Vancouver municipal council, July 8. A. Phillip proposes the building of a cable line from the end of the proposed extension of the B.C. Electric Ry. line to Essex St., up the mountain side. The first section of the proposed line would have a gradient of 15% and the second section a gradient of 28%, as against the 50% gradient proposed in the plan of the Grouse Mountain Scenic Ry., which was under consideration early in 1911. As no right of way would have to be acquired, the cost would be light, the preliminary estimate being $50,000. Power would be obtained from the B.C. Electric Ry. The council appointed a committee to interview the promoters, the B.C. Electric Ry. officials and the district council.

Marine Department

Accident to Gates of Lock 22, Welland Canal, Near Thorold, Ont.

By Emile Low.

One of the most serious accidents in the history of the Welland Canal occurred on June 20, about 3.30 p.m. at Lock 22, near Thorold, Ont., when the Canadian Government survey steamboat, La Canadienne, bound up from Lake Ontario to Lake Erie, and just entering the lock, ran into the upper gates and opened them. The subsequent rush of water dismounted both the upper and lower gates, wrecked the steamboat and a number of scows in the canal below, and drowned three boys who were near the canal bank.

The numbering of the canal locks begins with no. 1, at Port Dalhousie, on Lake Ontario, and extends southward to Port Colborne, on Lake Erie. The lock at Port Colborne, no. 26, is a guard lock, and lock 25 is at the northern end of the long Lake Erie lever, which ends a short distance south of Thorold. At the latter point the descent to Lake Ontario begins, skirting the escarpment between the two lakes.

La Canadienne was proceeding up through the canal on an inspection trip from Lake Ontario points to Duluth. She is a steel vessel, length 154.3 ft., breadth 22.7 ft., depth 10.9 ft. She had just passed out of lock 21, some 800 ft. below, and was entering lock 22. The lower gates of this lock were open, and were within the gate recesses, being held in place by the automatic gate hook. Along the lock walls are concrete snubbing posts; every vessel passing through the lock must have two men to attend to the snubbing line, one end being made fast to the vessel or to its capstan forward, and the other end to one of the snubbing posts. It seems that at the time of the accident the lower end of the snubbing line was in place around the snubbing post on the lock wall but its other end had not been securely enough fastened to the vessel, so that it did not hold as the vessel moved forward. The result was that the headway of the vessel was not checked and she struck the left hand leaf of the upper gate, opening the gate and allowing the water of the upper level to pour into the empty lock chamber.

The in rushing water lifted the upper gates off their sockets and carried them with the vessel into the canal below the lock. At the same time, the holding mechanism of the lower gates, being too weak for the rushing water, these gates also were torn from their fastenings and followed the vessel and upper gates into the canal below.

The boys who were drowned by the wave of water, had been playing on the bank of the equalizing basin to the left of the canal just below lock 22. Two out of five, succeeded in saving themselves, but three were carried away.

Of the accompanying illustrations, figs. 1 to 3, show the appearance of the canal prism just below lock 22 after the accident. The stranded vessel is lying on the right bank; its side was damaged, possibly by striking the bank, and the vessel sank. At the time the photographs were taken, the canal prism had been emptied, as an aid in finding the bodies of the drowned boys and for recovering the displaced lock gates of lock 22. These gates are seen lying on the banks in fig. 1, while in fig. 3, the lower gates are shown after they were put back in place, one of the upper gates still lying on the canal bank in the foreground. The sketch plan, fig. 4, exhibits the locality.

A device for minimizing the risk of accident in case of boats striking the lock gates has been installed at lock 24, and is being fitted to lock 21. This is the Gowan

Fig. 1. Looking Down Stream from Lock 22 to Lock 21. La Canadienne stranded on Right Bank.

Fig. 2. View from Waste Weir across Equalizing Basin towards Lock 21

Fig. 3. Lower Gates of Lock 22, Replaced.

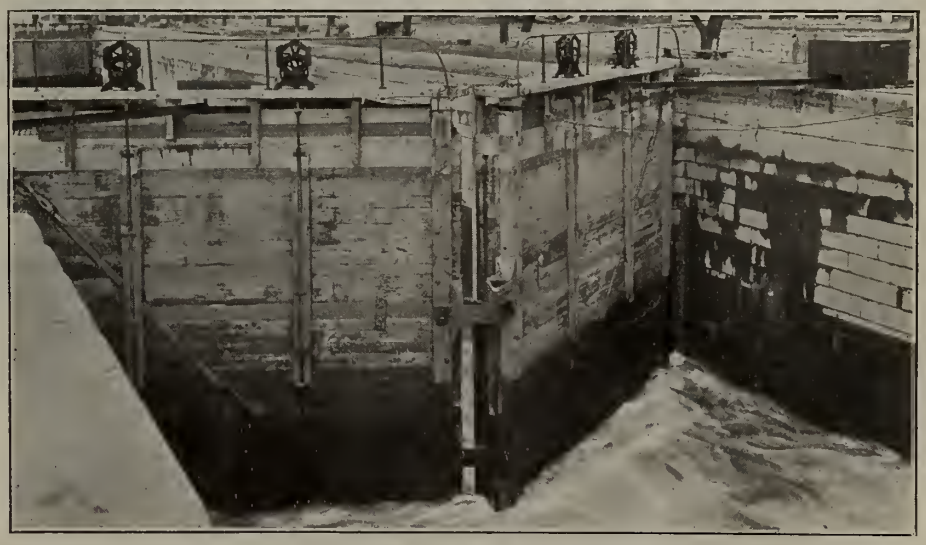


Fig. 6. Gowan Safety Appliance on a Lock Gate.

lock gate safety appliance. It is sketched diagrammatically in fig. 5, where its action when a boat strikes one leaf of the gate is represented; fig. 6 shows it applied to a lock gate. The device consists of two large horn castings, one on each gate-leaf, each having the face abutting against the other leaf, shaped to the arc of motion of that leaf. When one leaf is pushed back, the other leaf would, without this device, be forced down stream by the water pressure, and lack-

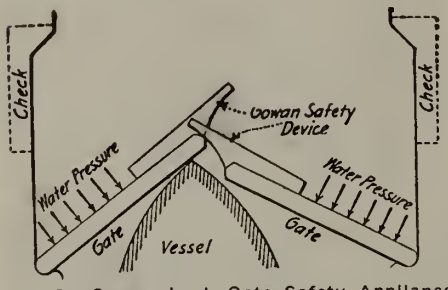


Fig. 5. Gowan Lock Gate Safety Appliance as fitted to a pair of Lock Gates.

ing the abutting pressure of the miter the leaf would be wrecked. The safety device prevents such action in case of small motions, and guides the leaves back to proper miter. It also helps to secure true mitering whenever the gates are closed.—Engineering News.

Canadian Railway and Marine World is indebted to W. H. Sullivan, Superintending Engineer, Welland Canal, for the photographs from which the accompanying illustrations were made.

New Plant Line Steamship for Halifax and Boston Service.

The Canada Atlantic and Plant Steamship Co.'s s.s. Evangeline was launched at Govan, Scotland, July 4, the christening being performed by Mrs. H. L. Chipman, wife of the Eastern Manager of the company, Halifax, N.S.

The vessel has 260 state rooms in addition to other cabins, and altogether has accommodation for 700 passengers, and crew of 95. There is also capacity for 1,500 tons of cargo. On the navigating bridge are situated the chart and wheel house, captain's and officers' quarters, wireless telegraph office, etc. The boat, or promenade deck extends practically the length of the vessel, and is occupied by the smoke room, entrance hall, 50 staterooms opening direct on deck, etc. The awning deck is devoted entirely to passenger accommodation, music room and state rooms de luxe. The dining saloon is on the main deck forward of the grand stairway, and is 60 by 45 ft., and aft of the dining saloon are 80 staterooms de luxe. On the lower deck are 20 family staterooms, and a ladies' cabin with 50 berths, and forward are the men's second class cabins and crew's quarters, while the kitchen, etc., are located amidships.

Special attention has been paid to ventilation, and also to heating; each stateroom is equipped with separate radiator under the control of the occupant, and the principal rooms are fitted with telephones connecting with the stewards' department. All the latest improvements in boats, life belts and other life saving appliances are supplied, also complete fire extinguishing plant, Kelvin's sounding machine, and Marconi wireless telegraph.

Her dimensions are, length over all, 364 ft., breadth 46 ft., depth moulded to main deck 33 ft. She is built entirely of steel to Lloyds 100 A1, with double bottom and six water tight compartments, and with ballast tanks carrying 450 tons of water, with specially built bilge keels 200 ft. long to give stability and steadiness. The machinery consists of twin engines and six boilers, 6,000 h.p., capable of developing a speed of 18 knots. The engines are of the reciprocating four crank cylinder triple expansion type, and the boilers are equipped with forced draught.

The vessel should have been launched in April, but considerable delay occurred owing to strike troubles.

Completion of the Richelieu and Ontario Navigation Co.'s Absorptions.

The absorption of lake lines, which the Richelieu and Ontario Navigation Co. had in view, was completed July 18, when the capital stock of the Inland Lines was transferred to the R. and O. N. Co., paymen' therefor being made, it is said, in R. and O.N. stock.

The Inland Lines Ltd., has headquarters at Hamilton, Ont., the officers being Jas. Playfair, President; J. P. Steedman, Vice President, and J. I. Hobson, Treasurer. It operates the following vessels on the Great Lakes: Donnacona, Dunelm, Dundee, Dundurn, Emperor, Empress of Fort William, Empress of Midland, Glenellah, Neepawah, Rosedale, Stadacona, Strathcona, Midland King, Midland Prince, Midland Queen, Wahcondah, Winona. Of these, all but the Dundurn are freight vessels.

The absorption of the Inland Lines gives the R. and O.N. Co. a combined fleet of 71 vessels, as follows:— R. and O.N. Co., 13 steamboats and 18 market line steamboats; Niagara Navigation Co., (including acquired from Hamliton Steamboat Co., and Turbine Steamship Co.), 8 steamboats; St. Lawrence Steamboat Co., 3 steamboats; Thousand Islands Steamboat Co., 3 steamboats; Inland Lines, Ltd., 17 steamboats.

Atlantic and Pacific Ocean Marine.

The Cunard Steamship Co. has arranged that its vessels on the Canadian route shall make Plymouth one of the English ports of call. The s.s. Ascania, which arrived at Plymouth from Montreal and Quebec, early in July, was the first vessel on the new schedule.

The Allan Line steamships at present under construction in Great Britain, and

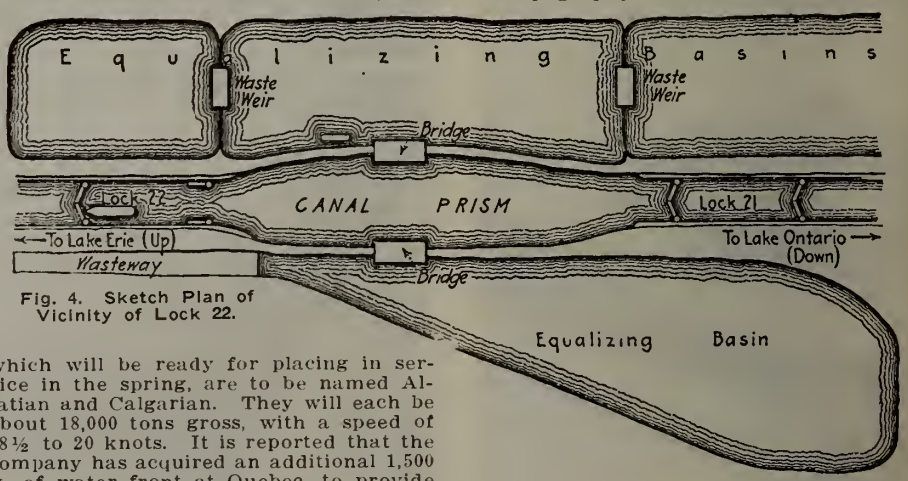


Fig. 4. Sketch Plan of Vicinity of Lock 22.

which will be ready for placing in service in the spring, are to be named Alsatian and Calgarian. They will each be about 18,000 tons gross, with a speed of 18½ to 20 knots. It is reported that the company has acquired an additional 1,500 ft. of water front at Quebec, to provide extra accommodation for its vessels.

Lord Strathcona, who presided at the Dominion Day dinner in London, Eng., July 1, said that there were three or four questions of paramount importance to the different parts of the Empire, the first was that of communications. He said that there were not yet, steamships of from 22 to 25 knots capacity passing between Canada and British ports, but he still hoped to see the trip done in four and a half days.

The Dominion Government has called for tenders for the construction of a powerful iron cruiser for the Customs service in the St. Lawrence Gulf. She is to be 185 ft. long, 32 ft. beam, with a draught of 10½ ft, and is to be fitted with 2,000 h.p. engines, and armed with two 26 lb. quick firing guns, in addition to the ram at the bow. She will carry 32 officers and men. She will be constructed with water tight bulkheads.

The C.P.R. s.s. Empress of China, which was wrecked on the Shirahama reef, off Japan, July 26, 1911, is reported to have been sold to a copper and iron dealer in Yokohama for $65,500, for breaking up. After the vessel was floated and touched up, at Nagasaki, it was expected that she might have been repaired sufficiently to enable her to be taken to England for complete repairs, but this project had to be abandoned.

Sir Montagu Allan, who was visiting in Winnipeg, early in July, is reported to have stated in an interview, that navigation on Hudson Bay, was no less practical than it was at one time on the St. Lawrence. The one drawback he saw in the inauguration of such traffic on Hudson Bay, was that no insurance company would take the risk without rates that would be practically prohibitive, but he considered that it was a place for government enterprise.

It is reported in New Westminster that the British Columbia Transport Co. is being organized to operate a freight steamship service between New Westminster and Great Britain, via Panama, on the opening of the canal. E. J. Fader, New Westminster, is interested in the scheme, which is connected with the proposal to form a British company with a capital of £250,000 and a British Columbia charter, for the operation of a steamship service between New Westminster and Victoria, and elsewhere, as mentioned in our last issue.

The Dominion Minister of Marine, in discussing the question of insurance rates on Canadian shipping, in London, Eng., recently, is reported to have said that undoubtedly a very strong sentiment exists in Canada for the establishment of either a Canadian Lloyds, or a Government system of insurance, and that in his opinion, there was unjust discrimination against Canada on the part of Lloyds, which is entirely unwarranted either by the topography of the Atlantic coast or by the statistics of wrecks. He believed that it would not be long before one or the other of these policies would be adopted.

Maritime Provinces and Newfoundland.

The Department of Public Works has received tenders for the construction of a sea wall at Windsor, N.S., and a wharf at Boisdale, N.S.

The Department of Public Works received tenders, July 24, for the construction of a breakwater at Seaforth, N.S., and for an extension to the breakwater at Somerville, N.B.

The harbor development construction work at Courtenay Bay, St. John, N.B., was inaugurated, July 11, by the Minister of Finance, who by an electric connection exploded a charge of dynamite, blowing up a portion of a hill which has to be removed.

The final report of the St. John River Commission is expected to be filed by Aug. 15. The whole river has been surveyed, and the report contains estimates of the possible amount of storage both for lumbering and power purposes. S. J. Chapleau represented the Dominion Public works Department.

An order in council has been passed abrogating an order in council of Apr. 10, which confirmed the bylaws relating to the employment of pilots and the equipment of pilot boats, passed by the pilotage authority of St. John, N.B., as information has been furnished that they require further consideration.

The St. John, N.B., schooner Abana, which was wrecked in West Quoddy Bay, Lubec, Me., Sept. 2, 1911, condemned as a total loss, and sold for the benefit of those concerned, has been rebuilt, and permission has been granted to have her re-registered under her old name, no. 96945, at the port of St. John, as before.

At the recent investigation into the cause of the stranding of the Magdalen Islands Steamship Co.'s s.s. Amelia at Boars Head, in the Bay of Fundy, on June 7, before Capt. W. R. Lugar, Assistant Wreck Commissioner, the captain, W. W. Hersey, was found guilty of negligence, and his certificate was suspended for three months. He was given permission to act as mate of a passenger vessel during that time.

The Dominion Public Works Department has under construction at Polson Iron Works, Toronto, a single screw seagoing tug, with hull of steel throughout. The machinery will consist of main engines, surface condensing type with cylinders 12 and 26 ins. diar., by 18 ins. stroke, supplied with steam at 145 lbs. working pressure, by a boiler of the Scotch return tubular type, 10 ft. diar, by 11 ft. long. She will be equipped with electric light plant, search light, steam steering gear and steam windlass. Her dimensions are, length 80 ft., beam, moulded, 20 ft., depth, moulded, 10 ft.

Province of Quebec Marine.

The Marine Department has decided on the construction of two steel steam tug boats at the Sorel yards, for use in connection with the dredges, now under construction for the St. Lawrence service.

The Quebec Transportation and Forwarding Co., launched a steam tug, named Margaret A. Hackett, from its plant on the St. Charles River, July 16. She is built of white oak, and is 115 ft. long, 24 ft. wide and 10½ ft. deep.

At a meeting of the Quebec Harbor Commission, July 15, it was decided to proceed with the improvements to the Commission's elevator, which is operated under lease by J. Richardson and Sons, Kingston. The improvements include the addition of a marine leg, and the expenditure will be about $25,000.

During June, permits to pass through the Lachine canal were issued to 1,587 vessels. The quantity of wheat passing through in June, was 3,636,788 bush., oats, 1,644,799 bush.; flax, 124,541 bush.; flour, sacks, 90,677; eggs, cases, 4,545, butter, pkgs., 1,438; cheese, boxes, 50,329; coal, tons, 54,085; coal landed on canal banks, tons, 56,214.

The Montreal Dry Dock and Ship Repairing Co., Ltd., was recently incorporated, with $50,000 capital, and office at Montreal, to operate the Tate dry dock, on the Lachine canal, of which it has obtained a ten years lease. The officers are, President, J. T. Walsh; Vice Presidinet, A. Larocque; Managing Director, T. Hall; Secretary-Treasurer, F. H. Fox.

La Compagnie de Navigation Canada's s.s. Florida was burnt at the Victoria pier, Montreal, July 7, and became, with her cargo, a total loss. She was operated between Montreal and points on the Richelieu River. She was built at St. Thomas de Pierreville, Que., in 1900, and was screw driven by engine of 5 n.h.p. Her dimensions were, length, 100 ft., breadth, 18.7 ft., depth, 5.8 ft.; tonnage, 201 gross, 128 register.

The floating dry dock, which is under construction, for Montreal at Barrow-in-Furness, Eng., was launched July 22, and christened "Duke of Connaught," by Mrs. Hazen, wife of the Dominion Minister of Marine. C. C. Ballantyne, one of the Montreal Harbor Commissioners, was present at the launching. For the reception of the dry dock at Montreal, 30 acres of land have been reclaimed at Maisonneuve, and the permanent basin walls and approach channels have been almost completed. The dock is to have a lifting capacity of 25,000 tons, and is made in three sections, so that three smaller vessels can be docked at the same time.

In response to the Dominion Government's request for proposals for the construction and operation of a dry dock and shipbuilding plant for Quebec, the site for which has been selected at St. Joseph de Levis, it is stated that no proposals, on the plans outlined by the Government, have been received, but that one tender for the construction of the dry dock alone, has been received. The tender is by Sir John Jackson and Sons, Ltd., of England and Montreal for about $2,500,000, the dock to be handed over to the Government on completion, for operation.

The Ontario and Quebec Navigation Co.'s s.s. Geronia, which sailed from Toronto, July 11, for Quebec, struck a rock in the Lachine Rapids, July 13, and was beached near Heron Island. The passengers were removed by the Verdun-La Tortue ferry steamboat St. Louis, and landed at Montreal. The Geronia was beached with 3 ft. of water at her bow and about 15 ft. at her stern. The Sincennes-McNaughton Co.'s tugs Rival and Natalie R. were put to work on her with the necessary pumps and outfit, and she was floated, July 16, when she was patched, where a large hole had been ripped in her side, after which she was taken to Montreal for examination and repairs.

Ontario and the Great Lakes.

The Canadian Interlake Line has received the steamboat Hamiltonian from the builders, and has placed her in service. She is full Welland canal size.

An Ottawa press dispatch states that a contract has been let to M. J. Hogan, for $213,000 to extend the pier at Port Colborne, Ont., to provide additional docking facilities.

The lake freighter Toiler, passed through the Welland Canal, July 15, with 101,000 bush. of grain, which is stated to be the largest single cargo to pass through the canal.

It was reported in Montreal, July 16, that the Richelieu and Ontario Navigation Co. was negotiating for the taking over of Round Island, in the St. Lawrence River, where it would rebuild the Frontenac Hotel.

The East Side Fish Co., Port Stanley, Ont., has ordered a marine outfit, consisting of fore and aft compound engine with cylinders 9 and 18 ins. diam., by 14 ins. stroke, and Fitzgibbon boiler, 60 by 108 ins., from the Polson Iron Works, Toronto.

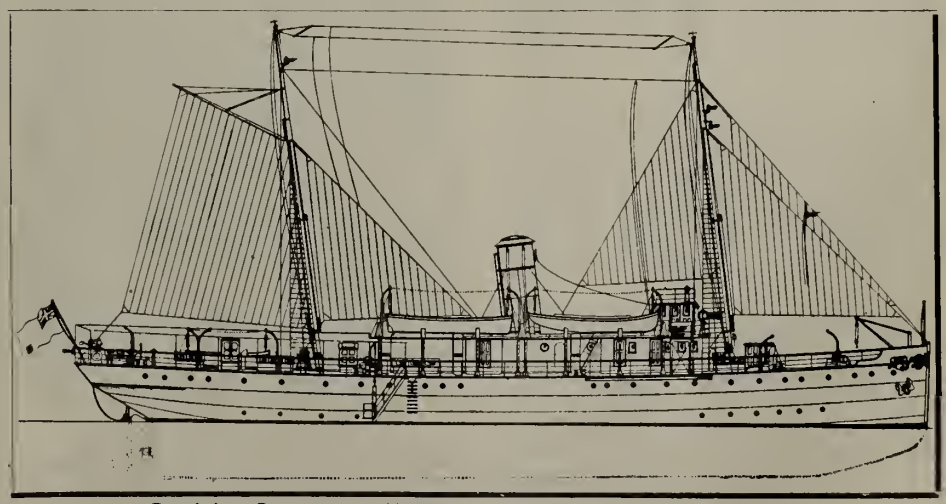
The Calvin Co.'s steamboat India, while entering the Welland Canal at Port Colborne, July 15, collided with the G.T.R. bridge, damaging her steering gear, and moving the pivots of the bridge. The accident is stated to be due to mistaken signals on the vessel.

Hon. F. D. Monk, Minister of Public Works, is stated in a press dispatch to have said at Sault Ste. Marie on July 19, that he had instructed the engineers to start preparing plans for the construction of a new canal and lock there and to go ahead with preparations for commencing work.

The Niagara Navigation Co.'s steamboat Cayuga, which recently broke three of her propeller blades, had three new ones put on, July 16, by the use of the coffer dam arrangement, designed by B. W. Folger, ex-General Manager, and which was fully described and illustrated in our issues of June and July, 1908.

In the article dealing with the absorption of three more steamboat lines by the Richelieu and Ontario Navigation Co., on pages 369 and 370 of our last issue, the name of W. Hanson, director, was given as W. Manson; and in the last paragraph of the article, the Inland Lines, Ltd., was referred to as the Island Navigation Co.

The Silver-Islet Navigation Co., Ltd., has been incorporated under the Ontario Companies Act, with $40,000 capital, and head office at Fort William, to conduct a general navigation and elevator business, etc. F. S. Wiley, R. L. F. Strathy, H. J.



Dominion Government Hydrographic Steamship for Atlantic Coast.
For description, see July, pg. 370.

Stephens, Port Arthur; J. J. Wells and P. H. B. Dawson, Fort William, are the provisional directors.

J. E. Russell, contractor, Toronto, has ordered from the Polson Iron Works, Toronto, a steel drill boat, for general use on marine contract work. The dimensions are, length, 80 ft., beam 30 ft., depth 6th. The boiler will be of the water tube type with steam at 150 lbs. working pressure. The hull and boiler only are being built by the Polson Iron Works.

The Lake Simcoe Navigation Co. Ltd., has been incorporated under the Ontario Companies Act, with $40,000 capital, and office at Toronto, to own and operate steam and other vessels, and carry on a general ship owning, navigation and transportation business. The incorporators are, R. J. Law, W. G. Simpson, F. C. L. Jones, I. M. Johnston and F. V. Dalton, Toronto.

The small steamboat, Emma, owned by C. E. Pratt, Parry Sound, and utilized in passenger service between Parry Sound, Depot Harbor and Rose Point, was burnt, July 4. She was built in Collingwood, in 1894, and rebuilt at Parry Sound in 1901. Her dimensions were, length, 89.3 ft., breadth 18 ft., depth 6.6 ft.; tonnage, 146 gross, 94 register. She was equipped with engine of 2 n.h.p., driving a screw.

Work on the preparation of the site for the dry dock, to be built in connection with Polson Iron Works, Toronto, was commenced July 16, when the contractor for the pile driving, J. E. Russell, started operations on the foundations for certain special machinery. W. Newman, Works Manager, stated that it was hoped to have one section completed by the fall, and the entire dock ready for the spring.

The Collingwood steamboat Wasaga, which was burnt, and afterwards sank near Copper Harbor on Lake Superior, in Nov. 1910, has been removed under the authority of the U.S. War Department. It is stated that the removal has disclosed an uncharted rock ledge, 375 ft. north, 49 deg. east from the north east corner of the old Booth wharf, covered by 17ft. of water, with about 20 ft. all round.

It is reported that the Dominion Government is arranging to acquire a site for an elevator at Port Arthur. The property under negotiation is next to the Canadian Northern Ry. elevator, and has 600 ft. frontage. It is also stated that the Port Colborne elevator is to be extended. The present capacity is 800,000 bush., and it is said to be the intention to bring it up to a capacity of 2,000,000 bush.

The Department of Railways and Canals has ordered from the Polson Iron Works, Toronto, a steel ice breaking tug, for use in the Sault Ste. Marie canal. Her dimensions are, length 55 ft., beam 13 ft., depth, 8 ft. 7½ ins. The machinery will consist of high pressure vertical engine with cylinder 12 ins. diar., by 14 ins. stroke, supplied with steam at 150 lbs. pressure, by a Scotch boiler, 7 ft. diar., by 9 ft. long.

F. E. Gibbs and W. D. Staples, members of the Dominion Government grain commission, visited Fort William, July 5, in connection with the proposed Government terminal elevator. Mr. Gibbs, is reported to have said that he was not in a position to make a statement as to the exact location of the elevator, but there was good reason for presuming that it would be erected on the water lots abutting on lot 19. Tenders for the erection of the elevator are being called for.

The U.S. Lake Survey reports the levels of the Great Lakes in feet above tidewater, for June, as follows: Superior, 602.22; Michigan and Huron, 580.48; Erie, 573.64; Ontario 247.34. As compared with the average June levels for the past 10 years, Superior was 0.18 ft. below; Michigan and Huron 0.53 ft. below; Erie, 0.24 ft. below, and Ontario 0.54 ft. above. It was anticipated that during July, Superior would rise 0.2 ft.; Michigan and Huron 0.1 ft.; and that Erie and Ontario would remain stationary.

The Canadian Interlake Line's freighter, Fordonian, which is expected to be in operation on the great lakes shortly, and which has been built at Glasgow, Scotland, is of full canal size, being 257 ft. long, 42½ ft. beam and 26½ ft. deep. She is equipped with a Carels-Diesel engine of the four cylinder, two cycle type, 1,100 h.p. driving a screw. The cooling water is circulated by a pump driven by a steam engine supplied by a donkey boiler equipped with oil burning apparatus, and which also operates the auxiliary appliances. Fuel will be carried to keep the main engine running for 25 days, and it is stated that the builders have guaranteed the vessel for six months regular service.

An investigation into the causes of the accident in the Welland canal at Port Colborne, when the Dominion Government steamboat La Canadienne, broke through the lock gates, June 20, was held at Port Colborne, July 5, before Capt. Lindsay, acting Wreck Commissioner, with Capts. Milligan and Atkinson, Port Colborne, as assessors. The blame for the accident was found to rest on the captain, Alex. Brown, with extenuating circumstances, owing to the fact that little or no assistance was to be had from the crew, who were ignorant of their duties and careless, and that the master's orders were di regarded in the use of the snubbing rope on entering the first lock. The master's certificate will not be interfered with, considering the inefficient manner in which the crew handled the ropes and performed their duties.

Manitoba, Saskatchewan and Alberta.

A meeting was held in Winnipeg, July 17, of members of the board of trade, the harbor commission, city council, and representatives from North Dakota and Minnesota, in connection with the proposals for the improvement of the Red River. The mayor of Winnipeg, as President of the Red River Association, presided, and resolutions were dealt with, urging both the Dominion and U.S. Governments to support the scheme.

The Hudson's Bay Co.'s steamboat, Slave Lake, which was launched at Athabasca Landing, Alta., recently, is of the following dimensions: Length 110 ft., beam 22 ft., depth of hold 4½ ft. She is equipped with engine having a cylinder 9 ins. diar., by 42 ins. stroke, driving a paddle wheel 14 ft. diar. She has been built for greight and passenger service on the Lesser Slave Lake, and her route will be from Salteaux Landing to Grouard. She has accommodation for 22 passengers, and about 50 tons of cargo. The company has another vessel under construction for use on the Athabasca river between Grand Rapids and Mirror Landing. She will be named Athabasca River, and is expected to be ready for service during August. Her dimensions are, length 135 ft., width 28 ft., depth of hold 3½ ft., and she is equipped with engine having cylinders 12 ins. diar., by 50 ins. stroke, driving a stern paddle.

British Columbia and Pacific Coast Marine.

The Public Works Department is calling for tenders for the construction of an extension to the public wharf at Port Moody. The plans cover the erection of a wharf 40 by 64 ft. and an approach from the present wharf of 1656 by 16 ft.

Arrangements are being made for an immediate start on the harbor improvements at New Westminster, for which the ratepayers have voted $500,000. It is expected that preliminary work will be so far advanced by September, that the concrete work can then be proceeded with.

The West Vancouver Ferry Co., Ltd., has been incorporated under the B.C. Companies Act, with $150,000 capital, and office at Vancouver, to carry on a general ferry business, own and operate steam and other vessels, and to carry into effect an agreement with the municipality of West Vancouver.

T. G. McBride and Co., on July 6, placed in service in the Vancouver harbor, a new steam tug named Moonlight. She was built in Vancouver, and has a displacement of 42 tons. The dimensions are, length 70 ft., beam 16½ ft., draught 7 ft. She made nearly 10 miles an hour on her trial trip.

The work on the G.T. Pacific dry dock at Prince Rupert, which was suspended owing to the death of M. Dow, the contractor, has been re-commenced, by Starrett and Co., of Seattle, Wash., and it is stated that the work will be pushed with all speed. The contractors hope to have it completed well within the contract time.

The Inland Navigation Co.'s s.s. Sol Duc, made her maiden trip on the Seattle-Victoria run, July 4. She was launched at Seattle, Wash., towards the end of June. Her dimensions are, length over all, 205 ft., length between perpendiculars, 195 ft., breadth over guards 34.9 ft., breadth moulded 32 ft., depth of hold 12.8 ft., depth moulded 14.3 ft. She has 51 state rooms with berth accommodation for 163 passengers.

In correcting some misstatements which appeared in some London, Eng., daily papers recently, regarding the harbor at Vancouver, it is stated that the Dominion Government is carrying on dredging operations in the Narrows which, when completed, will form a straight channel 1,250 ft. wide at the narrowest point and 35 ft. deep at low tide. It is also pointed out that there is no extra insurance on vessels entering Vancouver harbor, and that insurance does not cease when any vessel passes English Bay.

A difficulty has arisen at Vancouver regarding the payment of duty on fuel oil imported from the U.S. for the use of steamships, etc. The cargo of one vessel was held up there for four days recently, and the C.P.R. was compelled to enter into a bond for the amount of the duty claimed, to obtain its release. The oil shippers have stated that they will bring in no more fuel oil until a definite arrangement has been arrived at regarding the duty. It is stated that on this account, vessels using oil for fuel will have to take it on at Seattle, Wash.

E. H. Heaps, President, A.B.C. Elevator and Wharf Co., is reported to have stated, at Vancouver, July 12, that if there was no announcement from the Dominion Government shortly, in connection with the construction of a terminal elevator at Vancouver, his company would proceed at once with such an erection, and he hoped to be able to have it so far advanced, that they would be able to handle a part of this year's crop, provided the production was equal to present indications, and some of it was forced to seek outlet by Pacific ports.

An order in council has been passed, declaring Prince Rupert to be a shipping port, and the harbor to be a public harbor. The harbor includes Tuck inlet, Lake Wainwright and Porpoise harbor, with connecting and tributary waters enclosed between the main land and a line drawn north true across Venn passage through the east tangent of Dundas point, a line drawn north and south true through the west tangent of Snider rocks, a line drawn east and west true through the south tangent of Holland Island, and a line drawn north 34 degs. east and 35 degs. west true through the east tangent of Leer point.

Comments on the Dominion Canal Statistics and the Freight Rate Question.

A. A. Wright, Managing Director, St. Lawrence and Chicago Steam Navigation Co., Toronto, and ex-President, Dominion Marine Association, writes Canadian Railway and Marine World, as follows:

In your July issue, I notice an article on the Dominion Canal Statistics for 1911, in which you quote statements from the comptroller, J. Lambert Payne, which tend to show that the money expended by the government in canal construction and maintenance is wasteful and that freight can be carried cheaper by rail.

I do not think this was Mr. Payne's intention, but, in case it is, or that his article has been misunderstood, I would point out some important omissions in his calculations. He assumes that the railways are built entirely by private capital. In Canada at least this is not correct, as the usual practice is virtually for the government to build the railway and present it to the nominal owners, either by direct grants of land and money, or else by guarantees of bonds, or usually by both methods, which makes the country assume the entire cost and risk of the success of the road. The railway business is then put on a paying business by charging high rates. in fact, the extreme limit the traffic will bear, putting surplus earnings taken from the public into the road, eventually making the road worth the value of the original cost, plus the common stock issued, which is the promoters' profit, and the premiums to bond holders, before they are forced to reduce the rates by water competition or else by a railway managed by some other group of promoters.

The other mistake he makes is in charging the interest and cost of maintenance of canals against the volume of business which may be at the moment passing through, instead of on approximately the amount of traffic the canals could eventually take care of, because canals must anticipate business. It should be borne in mind also that the traffic passing through the Welland and St. Lawrence canals is now, and always has been seriously reduced by lack of facilities in Montreal to take care of the business, and it is notorious that for years men have been almost driven out of the Montreal trade because they could not get despatch for their vessels in that port. The present Welland and St. Lawrence canals could handle, without any difficulty, many times the volume of traffic which they are now handling, and, even an increase of 100%, which would quickly take place if Montreal furnished necessary facilities, would cut the government contribution for interest, maintenance, etc., from 0.265 per ton to just one half that amount.

Another matter which must not be lost sight of, is the effect of the canal competition on freight rates in general, and probably this can be appreciated just as well by mention of the fact that before the present canals were developed as they are now, freight rates as high as 32c. per bush. or $10.66 a ton, have been paid on grain from Chicago to Montreal and no one need ask what the rail rate would be now from Chicago to Montreal if the canals had not been improved and were still the vessel rate, instead of $1.50 a ton as at present.

Further, vessel rates are much higher than they need be, because the railways control most of the terminals, and delays and excessive elevator and other charges are necessarily added to the vessel rate, as it costs practically as much to keep a steamboat lying at a dock as running in the lake.

Contrast $2 a ton, plus even Mr. Payne's charge of approximately another $2 a ton, or $4 a ton on vessels for 1,245 miles, Fort William to Montreal, all water, with $1.10 a ton Georgian Bay ports to Toronto on wheat, or $1.70 a ton on lumber, 95 to 125 miles, or equal to about $11 to $16 a ton Fort William to Montreal. These rates show clearly that Mr. Payne's rail rates are competitive rates with water, and the Buffalo-New York route, and are not a fair example of rail rates.

It is needless to multiply examples, but I think I have shown that money intelligently expended on canal and waterway improvements is decidedly in the public interest. I am, however, decidedly in accordance with Mr. Payne's policy of showing what canal and waterway improvement costs, as I think that will have a tendency to discourage wasteful expenditures like the Trent and projected Georgian Bay canal.

The expenditure on lighthouses, etc., is well spent and cannot be charged against the canals, because on the upper lakes freight is carried by water at an average of about 40 cents a ton for an average distance of about 800 miles, or about 0.05 cents a ton mile, or about a tenth of average rail rates, which run about half a cent a ton a mile.

No better answer to the question of the relative cost of moving products by water as against all rail, need be stated than the fact that the railways are amongst the largest vessel owning corporations on the lakes.

A Reply by the Comptroller of Statistics.

A copy of Mr. Wright's foregoing letter was furnished the Comptroller of Railway and Canal Statistics, J. L. Payne, who has written Canadian Railway and Marine World as follows:—

With an earnest desire to avoid anything of a controversial character, it may not be amiss to say that the report to which your correspondent alludes was not in any sense intended to discount the value of our canal system in its relationship to our scheme of transportation facilities as a whole. The matter was dealt with purely from the statistical standpoint, and the figures used had reference to the year 1911. It is not, except in a broad way, the functions of a statistician to debate economic issues. His duty is to supply facts, and, incidentally, to present certain logical deductions. The discussion of the probable freight rate on our inland waters was last year undertaken in an academic spirit, in the absence of definite and basic facts. This year an earnest effort is being made to gather data which will enable that rate to be definitely and accurately determined. When that stage is reached, we shall, happily, be outside the realm of speculation. We shall be able to make a fair comparison of freight rates by water with freight rates by rail. So far as I know, this will be the first comprehensive inquiry of that character made in either Canada or the United States. It is true the Bureau of Railway Economics at Wasington issued a report last year, making a comparison between freight rates on the Erie canal and on railways running parallel to that canal, but that report, valuable and helpful as it is, was not based on such a set of facts as the Department of Railways and Canals is getting for the year now current.

During May, three fatal, and four non-fatal accidents were reported in connection with the navigation of Canadian waters. Two of the deaths were due to falls overboard, and one to a fall into the hold.

The Imperial Export and Import Co., Ltd., has been incorporated under the Ontario Companies Act, with $1,000,000 capital, and office in Toronto, to carry on the business of merchants, forwarders and warehouse men, and to act as agents for marine and other insurance, and as agents for vessels, etc.

Steamship Routes in Northern Waters.

The dream of establishing trade routes in far northern waters has been cherished by navigators for centuries, and has been the incentive of many voyages that are land marks in the history of exploration.

The partial realization of this dream now seems to be at hand. The long talked of Hudson Bay Railway, to connect with a steamship line via Hudson Bay, Hudson Strait, and the Atlantic to the Old World, is at last assured. If the hopes of its promoters are realized, it will afford for two or three months in the year an outlet for the vast resources of western Canada; above all, improved facilities for moving the Canadian wheat crop to European markets.

An analogous project on the other side of the Atlantic contemplates the establishment of regular steamship service between England and Siberia by way of the Kara Sea and the estuaries and the Yenisei and the Obi Rivers. This plan, proposed by an Englishman, Capt. Webster, has been approved by a Russian government commission. Steamers will run from English ports to a harbor on the southwest coast of Novaya Zemlia. There the cargoes will be transferred to smaller vessels especially built for ice navigation, and thus carried to the Siberian rivers. It is expected that navigation will be limited to two months in the year, which will afford time for three round-trip voyages. The cargoes will include grain, timber, graphite, mica and other minerals.

Finally, the Russian government is making every effort to establish a regular sea route to northeastern Siberia by way of Behring Strait. During the summer of 1911 Rear Admiral Trajan, acting under instructions from the Imperial Ministry of Industry and Commerce, took the steamer Kolyma from Vladivostok to Nijni Kolymsk, at the mouth of the Kolyma River, where a quantity of freight was landed, after which the vessel returned to Vladivostok, the whole journey occupying two months. A little later in the season this feat was duplicated by a United States sailing vessel, equipped with an auxiliary motor. In this case the journey was made from Alaska.

The experience of the Kolyma showed that a light draught vessel, by keeping close inshore, was able to avoid the heavier ice fields. The Kolyma was not especially adapted for ice breaking.

Montreal Harbor Improvements.

Further improvements are contemplated by the Harbor Commissioners, involving an expenditure of about $2,000,000. The plans cover the building of a concrete pier, 1,200 ft. long, straight into the river opposite the Commission's offices at the foot of McGill St. The place selected for this pier is now used as a basin for vessels entering and leaving the canal, and as, with the construction of the pier, this would not be possible, it is contemplated to remove the entrance to the canal to a more convenient point westward. Other improvements include the deepening of some of the old basins and the building of some concrete wharves, together with the lengthening of the King Edward, Alexandra and Jacques Cartier piers, by 300 ft. each. The new pier at the foot of McGill St. will give accommodation for two additional ocean going vessels.

Work on the increased elevator accommodation is progressing, also on other of the various improvements already in hand.

Plans are in course of preparation for additional permanent sheds and further improved railway facilities are also being discussed.

Canada-West Indies Steamship Service.

The existing contract for a steamship service between Canada and the British West Indies and British Guiana, expires July 1, 1913, and in consequence of the recent report of the commission appointed to enquire into the general service with the West Indies with a view to improvements and extensions, the Dominion Department of Trade and Commerce is inviting tenders for a mail, cargo and passenger service between Canada, the British West Indies and British Gulana, and between Canada and Jamalca. The service for the West Indies and Guiana is intended to be every 10 or 12 days from Canada, to Georgetown, calling each way at St. Kitts, Antigua, Montserrat, Dominica, St. Lucia, St. Vincent, Barbados and Trinidad, with Halifax or St. John, or both, as the Canadian ports. The tenderers are also asked to send proposals for a monthly service from Montreal, during the St. Lawrence navigation season, calling at Quebec each way, and the West Indies ports previously enumerated. Permission will be given for the vessels to call at any British port in the West Indies, and the contractor shall have the option of calling at any of the foreign islands for the sole purpose of discharging any Canadian cargo.

The Jamaica service is intended for vessels of from 1,600 to 3,000 net tons, having a speed of from 10 to 15 knots, sailing from either Halifax or St. John, or both, every 7, 10 or 12 days, calling each way at Bermuda.

In tendering, the following information must be given:—registered gross and net tonnage and passenger accommodation of vessels to be employed, average speed, period of round voyages, the annual subsidy required therefor, and the date on which the contractor will be in a position to supply the service.

Preference will be given, other conditions being equal, to the tenderer providing the most satisfactory conditions as to general accommodation, and also as to cool air chambers, insulation for the protection of fruit, etc.

The vessels to be employed must be of class A1, and be of British register, capable of maintaining a minimum speed of 12 knots when loaded at sea under normal weather conditions. The Minister of Trade and Commerce has power to prescribe the maximum freight and passenger rates, and to provide that no discrimination shall be made against Canadian importers and exporters.

The Largest Vessel Yet Constructed.

The s.s. Imperator, which is being built at Hamburg, Germany, for the Hamburg American Line, and which was launched recently, will exceed the ill-fated Titanic by some 5,000 tons. She is 900 ft. long, beam 96 ft. and molded depth 62 ft. From the keel to the boat deck will be 100 ft., and from the keel to the trucks of the masts will be 246 ft. The three funnels will be oval in section, measuring 18 ft. on the smaller and 29 ft. on the greater axis. The rudder will weigh 90 tons and the diameter of the rudder stock will be 2½ ft.

She will be driven by turbines of 70,000 h.p., which will be developed on four shafts. Her estimated speed is 22½ knots. She will have water tube boilers and will be fitted with U-shaped anti-rolling tanks. This device consists of tanks of large capacity, built on opposite sides of the vessel and connected by an inclosed waterway, through which the water can flow from side to side of the ship as she rolls, its flow being subject to control by valves.

The sub-division of the Imperator below the water line has been carried out under the supervision of the Germanic Lloyd's and the immigration authorities. It consists of a series of intersecting transverse and longitudinal bulkheads. Transversely, the ship is subdivided by 12 bulkheads, which are carried two decks above the water line, with the exception of the collision bulkhead forward, which extends four decks above the same level. These bulkheads are intersected by longitudinal bulkheads, which subdivide the boiler and engine rooms, the under water portion of the ship being divided altogether into 24 separate watertight compartments. There are four boiler-rooms, containing the water-tube boilers. The coal bunkers are placed above the boiler rooms, and along the sides of the ship, in the latter case being known as wing bunkers. The longitudinal bulkheads are placed about 19 or 20 ft. in from the side of the ship, and they extend from bulkhead no. 4, aft to bulkhead no. 8. Astern of the aftermost boiler room is the forward turbine engine room, which is protected against flooding by two wing bulkheads, between which and the sides of the ship are placed the auxiliaries. The after turbine engine room is divided by a central longitudinal bulkhead.

Because of its great size, special interest attaches to the turbine installation. The rotor, or rotating part, contains 50,000 blades, and is capable of developing over 22,000 h.p. The casing is 18 ft. in diameter and 25 ft. long. The shafting of all four propellers is 1½ ft. in diameter. The turbadium bronze propellers are 16 ft. 8 ins. in diameter. Although the engines are spoken of as being of 70,000 h.p. it is probable that on test they will develop from 80,000 to 85,000 h.p.

The Imperator will probably make her maiden trip to New York in the early summer of 1913.

Sault Ste. Marie Canals Traffic.

The following commerce passed through the Sault Ste. Marie Canals during June, 1912:

ARTICLES			CANADIAN CANAL	U. S. CANAL	TOTAL
Copper	Eastbound	Short tons	864	10,040	10,904
Grain	"	Bushels	4,133,652	1,536,926	5,670,578
Building stone	"	Short tons	.....	.....	.....
Flour	"	Barrels	309,562	660,590	970,152
Iron ore	"	Short tons	4,836,092	2,542,737	7,378,829
Pig iron	"	"	.....	.....	.....
Lumber	"	M. ft. b.m.	4,381	105,787	110,168
Silver ore	"	Short tons	.....	.....	.....
Wheat	"	Bushels	6,850,380	5,332,797	12,183,177
General merchandise	"	Short tons	2,584	43,529	46,113
Passengers	"	Number	2,482	1,850	4,332
Coal, hard	Westbound	Short tons	25,300	181,760	207,060
Coal, soft	"	"	409,606	1,652,769	2,062,375
Flour	"	Barrels	.....	.....	.....
Grain	"	Bushels	.....	.....	.....
Manufactured iron	"	Short tons	31,139	52,865	84,004
Iron ore	"	"	.....	2,688	2 688
Salt	"	Barrels	21,385	55,280	76,665
General merchandise	"	Short tons	101,218	77,234	178,452
Passengers	"	Number	3,817	1,410	5,227
Summary.					
Vessel passages		Number	1,127	2,277	3,404
Registered tonnage		Net	3,829,513	4,594,108	8,423,621
Freight—Eastbound		Short tons	5,173,605	3,027,628	8,201,233
" —Westbound		"	570,318	1,975,608	2,545,926
Total freight		"	5,478,923	5,003,236	10,747,159

Canadian Notices to Mariners.

The Department of Marine has issued the following:—

45. June 20. 117. Nova Scotia, Cape Breton Island, east coast, Sydney harbor, south east bar, gas buoy withdrawn, north west bar, conical buoy replaced by gas buoy.

46. June 26. 118. Ontario, Ottawa river, Lake Deschenes, Baskins wharf, change in front range light. 119. Ontario, St. Clair river, Sarnia, wreck of steamer Joliet, wrecking barges withdrawn, lightship replaced. 120. Ontario, Georgian bay, Meaford, extension to east breakwater, temporary lights, caution. 121. Ontario, Georgian bay, south side, Lockerbie rock, change in position of gas buoy.

47. June 27. 122. British Columbia, Prevost passage, Joan rock, buoy established. 123. Alaska, Yakutat bay entrance, Ocean cape, light established. 124. Alaska, Prince William sound, Hinchinbrook entrance, Zaikoff point, light established.

48. July 2. 126 Maritime Provinces and Quebec, Canadian list of lights and fog signals, new edition. 127. New Brunswick, Bay of Fundy, Machias Seal island, easterly light permanently discontinued, erratum. 128. Prince Edward Island, south coast, Bedeque bay, change in position of Miscouche fairway gas buoy. 129. Newfoundland, south coast, Placentia bay, Little Burin island, fog alarm established.

49. July 8. 130. Bay of Fundy, Brier island, north west ledge, change in position of gas and whistling buoy. 131. Quebec, Gulf of St. Lawrence, Anticosti island, Bagot bluff, new lighthouse. 132. Ireland, north coast, Rathlin island light, alteration in character.

50. July 11. 133. New Brunswick, Bay of Fundy, east of Deer island, Tinker ledge, spindle erected. 134. New Brunswick, each coast, Northumberland strait, Richibucto harbor entrance, change in position of lights on the south beach and north beach.

51. July 13. 133. British Columbia, Vancouver island, Alberni canal, Somass river, beacons. 136. British Columbia, Seaforth channel, uncharted rock north of Dall patch, change in position of gas and whistling buoy. 137. British Columbia, Observatory inlet, beacon established, buoys established.

52. July 16. 138. Nova Scotia, Bay of Fundy, Lurcher shoal, light ship to be removed from her station temporarily for repairs. 139. Nova Scotia, Cape Breton island, east coast, Scatari island, telephone line.

53. July 17. 140. Quebec, St. Lawrence River, survey steamer at work eastward of Father Point, caution.

54. July 18. 141. New Brunswick, Bay of Fundy, Chignecto channel, buoys in the vicinity of Grindstone island. 142. New Brunswick, Bay of Fundy, Calhoun flats, location and description of buoy.

55. July 18. 143. Ontario, Canadian list of lights and fog signals, new edition. 144. Ontario, Georgian bay, Meaford, extension to east pier, eastern entrance to habror to be closed, light to be moved to the west end of breakwater.

The name of the steamboat Schwalbe, registered at Lunenburg, N.S., has been changed by order in council, to Northern Messenger.

Among the Express Companies.

The Canadian Northern Ex. Co. has opened an office at Birch River, Man., and has closed its office at Mafeking, Man.

The Adams Ex. Co. has adopted the system of issuing travellers' cheques, and has made arrangements throughout Canada, the U.S., and Europe, as well as other points, for dealing with them.

F. J. Butler, who has been agent, American Ex. Co., at Quebec, for several years, was entertained at dinner, July 4, by a number of friends on his leaving the city for Boston where he has been transferred on the company closing its offices on the Quebec Central Ry., over which, since it has passed under C.P.R. control, the Dominion Ex. Co., is now operating.

The Board of Railway Commissioners, July 3, refused the application of the city of Ottawa, for the extension of the collection and delivery limits for express companies. D'Arcy Scott, Assistant Chief Commissioner, in dismissing the application said that the Board's expert had already reported on the limits in March last, since when there had been no change of a character to warrant an extension.

Instructions issued by the Board of Railway Commissioners, regarding Sunday deliveries, require that express agents shall receive for carriage by the first train stopping at the consignee's station on Sunday, any shipment of medicines, drugs, instruments or apparatus, which they are assured by a physician, or a dealer in medical supplies, are urgently needed for saving human life, or alleviating human suffering. Such shipments must not be c.o.d.'s, and they must be prepaid and fully addressed, and tendered at the railway station. As house delivery may be impracticable and the agent at the consignee's station may not be required to meet the particular train, the shipper must be advised to telegraph the consignee to be on hand to receive the goods on arrival of the train.

As a result of the recent investigation into express rates, etc., in the C.S., by the Interstate Commerce Commission, a number of changes in regulations and practices, the methods of operation, and general rating have been ordered. Of the 13 companies dealt with, the report states that they are separate legal entities, but that it is interesting to regard the fact that by stock ownership and otherwise, they are so interlaced, intertwined and interlocked, that it is with difficulty that any one of the greater companies can be traced as either wholly independent in its management or the agency of a single railway system. So that while these companies compete with each other for traffic, the express business may be said to be almost a family affair. The new rates may be said to be based on a minimum charge of 21c. a pound, increasing in ratio to the increase of weight and distance, at rates varying from 3-10c. to 12c. a pound, approximately making 12c. the highest rate per pound for the greatest distance within the U.S., exclusive of Alaska. The reductions in general average about 15%.

Express Companies in Canada.

Following are particulars of the three express companies which have their headquarters in Canada:—

Canadian Express Company

This company was organized Feb. 16, 1865, under authority of 27 and 28 Vic., chap. 23. It has an authorized capital stock of 30,000 shares of $100 each, of which 17,052 have been issued and are outstanding. The cash realized from the sale of these shares is reported at $865,200. The purchase of the capital stock of the company by the Grand Trunk Ry. Co. was effected in 1891 by the payment of $660,000 in cash. The total capital liability at the time was $1,500,000. Since then the capital stock has been increased to $1,705,200. The company does not report a rate of dividend. All the stock is held in trust for the G.T.R. Co. by A. W. Smithers, C. M. Hays (since deceased), E. H. Fitzhugh, W. Wainwright, M. M. Reynolds, F. Scott, H. Paton and E. J. Chamberlin. With the exception of Mr. Smithers, these gentlemen are all directors of the company.

The officers are:—President, J. Pullen; Secretary-Treasurer, F. Scott; General Counsel, W. H. Biggar; General Auditor, W. W. Williamson. The headquarters are at Montreal.

The operations of the company are chiefly over the G.T.R., the G.T. Pacific Ry. and the Canadian Government Railway System. It has a total operating mileage of 7,230.

Dominion Express Company.

This company was organized May 23, 1873, under 36 Vic., chap. 113. The capital stock is $2,000,000, divided into 20,000 shares of $100 each, all of which is outstanding. Following are the directors:—Sir Thos. G. Shaughnessy, W. S. Stout, R. B. Angus, C. F. Smith and C. R. Hosmer. These directors are trustees of the entire stock of the company for the C.P.R. Co. A dividend on the capital stock, at the rate of 8% per annum was declared on June 30, 1911.

The officers are:—President and General Manager, W. S. Stout; Vice President, C. F. Smith; Secretary, H. C. Oswald; Treasurer, G. A. Newman; General Auditor, W. H. Plant. The head office is in Toronto.

The company carries on business over the lines of the C.P.R. and many connecting roads, and has an operating mileage of 13,709, apart from 14,148 of ocean going mileage.

Canadian Northern Express Company.

This company was organized June 13, 1902, under 2 Edward VII., chap. 49.

The company has an authorized capital stock of $1,000,000, consisting of 10,000 shares of $100 each. Of this stock $300,000 was outstanding on June 30, 1911, on which a dividend was not declared. Mackenzie, Mann and Co., Limited, control the company by right of ownership of 90% of the capital stock. The directors are:—Sir Wm. Mackenzie, Sir Donald D. Mann, A. J. Mackenzie and Z. A. Lash. Headquarters are at Toronto, but the General Superintendent is located at Winnipeg.

The officers are:—President, Sir Wm. Mackenzie; Vice President, Sir Donald D. Mann; Secretary, R. P. Ormsby; Treasurer, L. W. Mitchell; Chief Solicitor, G. G. Ruel; General Counsel, F. H. Phippen; Auditor, J. D. Norton; General Superintendent, W. C. Muir.

The company operates almost entirely over the Canadian Northern Ry., and had a mileage on June 30, 1911, of 4,422.

The other express companies operating in Canada, but which have their head offices in the United States, are:—American Express, United States Express, National Express, Great Northern Express, Wells, Fargo & Co.

Telegraph and Cable Matters.

The Canadian Northern Telegraph Co. has opened an office at Birch River, Man., and has closed its office at Mafeking, Man.

The Grand Trunk Pacific Telegraph Co. has adopted the night lettergram service, which has been in use, for some time, by other companies.

The Western Union Telegraph Co. is stated to be negotiating for a site for a new cable office in Cape Breton, and that it will probably erect a building in Sydney.

The Great North West Telegraph Co. has opened an office at Wyebridge, Ont., has re-opened its offices at Birkendale and Rondville, Ont., and has closed its offices at Bayfield, Rosseau and Yarker, Ont.

The Marconi Wireless Telegraph Co. has opened a new office in the Strand, London, Eng. This has been connected with the Clifden, Ireland, station, by a private wire, in order to facilitate communication with Canada and the U.S.

The Western Union Telegraph Co. has lowered the rates between points in Canada and the U.S. which are comparatively near the border line, from 40c. for ten words to 30c., this reduction also affecting the night lettergram rates between the same points.

A meeting of superintendents of the various divisions of the C.P.R. telegraph system of the western lines, was held in the office of B. S. Jenkins, General Superintendent, C.P.R. Telegraphs, Western Lines, Winnipeg, July 15, for the discussion of proposed extensions and betterments of the service. It is stated that similar conferences will be held annually.

The Dominion Telegraph Co., held its annual meeting at Toronto, July 10. The financial statement for the year shows a credit balance of $292,993.57. The company's lines are operated under lease by the Great North West Telegraph Co. for 99 years, at an annual rental of $60,000, this amount being distributed to the shareholders in the form of dividend. The directors were re-elected for the current year.

D. Coons, Superintendent, Alberta Division, C.P.R. Telegraphs, is reported to have stated in Lethbridge, July 2, that telegraph lines were to be extended, at once, to Cardston, making a direct circuit to Calgary. Poles are being distributed along the route, and it is hoped to have the work completed in 30 days after commencing. Agents will be placed at Raymond, Magrath, Spring Coulee, Cardston and other points.

The Judicial Committee of the Privy Council decided, in London, Eng., July 10, that the contract between the Newfoundland Government and the Commercial Cable Co., of Feb. 1909, is valid, and binding on the Government. The contract was entered into by the last Government just before its defeat, and was repudiated by the present Government, which repudiation was upheld by the Newfoundland Supreme Court.

The matter of placing the Great North Western Telegraph Co.'s wires under ground at Sparks St., Ottawa, was again before the city board of control, July 11. Some time ago the city agreed to pay the G.N.W. Telegraph Co., which has perpetual wire rights on Sparks St., $9,000 to have its wires placed underground in conduits, but the city solicitor recently wrote to the board of control to the effect that if the matter were taken to the Board of Railway Commissioners, it was probable that the company would be ordered to place the wires underground at its own expense or to pay rent for the use of the city condults.

The Quebec Public Utilities Commission applied to the Board of Railway Commissioners, July 15, for an order directing the Great North West Telegraph Co., and the C.P.R. to comply with the Utility Commission's order respecting overhead wiring and precautions against fire. E. W. Beatty, General Solicitor for the C.P.R. questioned the Board's purisdiction, and Assistant Chief Commissioner Scott announced that a letter had been received from the G.N.W.T. Co. agreeing to carry out the work. Ultimately the C.P.R. also agreed, and the case was recalled, the Board, in the meantime, being doubtful of its jurisdiction in the matter.

G. D. Perry, General Manager, Great North West Telegraph Co., who was in Ottawa recently, is reported to have stat-

ed that the company was in no way obstructing the matter of placing wires under ground, as alleged. The company was prepared to enter into a nagreement with the city in the matter some time ago, and a draft agreement was prepared, but the company was unable to execute it as it had granted certain privileges to the Ottawa Electric Co. If the city and the Electric Co. can come to an arrangement, releasing the G.N.W.T. Co. from its obligation, the company is prepared to commence the underground work at once.

Hints on Telegraph Matters.

By W. J. Camp, Assistant Manager, C.P.R. Telegraphs.

Following are extracts from a paper read at a meeting of the Association of Railway Telegraph Superintendents:—

INSULATORS.

During the period from 1887 to about 1898, the C.P.R. used white porcelain insulators on a portion of the long through wires. These were of German or British manufacture. An elaborate series of tests proved their great superiority over glass from a mechanical standpoint, the average blow necessary to break a porcelain being three times that required to break the glass insulator. It was also discovered that usually a porcelain insulator was only partially destroyed when hit by a stone, and that the wire was not set free and remained fastened to each pole, but the glass insulator was so badly shattered that the wire would be freed, and this frequently resulted in a cross with other wires which remained attached to the pole. This advantage was offset to some extent by the fact that, on account of the porcelain insulator being white, it offered a much better mark and was the one aimed at. The price of the porcelain insulator was increased until it reached about nine cents each laid down in Montreal, and its use by us, therefore, abandoned for some years. The glass insulator with which we were supplied then depreciated in quality, apparently on account of improper annealing, and appeals or complaints to the manufacturers resulted in no improvement; and, as the cost of the porcelain insulator was again very largely reduced, we have purchased nothing but white porcelain for the past three years.

In 1910 we procured porcelain insulators from Canada, the United States, and Germany. One make turned out to have defective insulation properties, and we had a series of tests made comparing the three manufactures and glass. All of the insulators were of the same pattern and dimensions. One dozen insulators of each make, selected at random, were placed on pins in the open air, and frequent readings taken of insulation, humidity, temperature and barometer. During the tests the weather was of nearly every description, from dry cold to sleet, wet snow and rain. These tests proved that in every respect the German and United States insulators had from 5 to 10 times the insulating qualities of the Canadian and glass insulators, the two former giving practically the same results with a slight difference in favor of the German, and the Canadian porcelain and glass almost on a par. Tests of wires after erection show the same differences.

TRANSPOSITIONS.

The first telephone dispatching circuit we installed was transposed every half mile. The selectors were in series, alternating on each wire. The circuit was found to be slightly noisy, and we then transposed it every quarter mile, which cut down the noise for a time, but we found it almost impossible to keep the circuit free from noise while working the selectors in series; and, as we found that most of the failures were due to the contact points of the relay, we changed from series to main line bridging selector without relay. Since then the circuit has been practically free from noise, and on all subsequent circuits installed the same method has been followed. We now transpose all our dispatching circuits every quarter mile, except where two circuits parallel each for a portion of the way. Over this section one circuit is transposed every quarter mile, and the other every half mile. Looking forward to the time when the telephone will be used for other work, we arrange transpositions on our copper telegraph wires (and sometimes on the iron), every half mile for the first pair, and for the second pair, every mile, or transposed at the quarter, three-quarter, and mile, skipping the half mile.

Our method for transposing when the two wires are on the same arm, is by the use of a curved iron bracket under the arm, and so placed that the wire it carries comes directly under the wooden pin carrying the other wire over the top of the arm. This bracket is specially made for us, but the arrangement is similar to that of the Harvard Co. Where the two wires are on separate arms we place an extra pin on the upper arm half way between two of the regular pins, and skip the pin on the lower arm. By these methods we have largely decreased the liability of crosses in case of broken insulators.

LIGHTNING PROTECTION.

The problem of adequate lightning protection is a most serious one with the C.P.R. on the portion of the line between Lake Superior and the Rocky Mountains on account of the excessive severity of the lightning in this district. I might say that we are between the devil and the deep blue sea. If we use sufficient arresters to take care of the frightful discharges, we most likely will kill the telephone circuit by having so many "traps for bugs." We have been using in the stations where the fone line is looped, four Argus arresters, without fuses, on the four ends of the wires, and two Argus arresters with fuses on the bridge wires to the fones and selector. At stations where the circuit is only legged in we have two Argus arresters, with fuses. At the dispatchers office, besides the Argus arresters, we equipped the first three poles from the office with O'Connell pole arresters. In some sections this protection seems to be adequate, the circuit being worked right through storms, but in the district above mentioned it does not appear to be sufficient, my reports showing that at times the telephone has to be abandoned for an hour or more on account of lightning.. There have been some interruptions on account of the pole arresters, and this year we are trying out the branch office and pole arresters to the same extent as the former equipment. Some of our superintendents have asked for pole arresters at every station, but I am afraid that if such were installed they would prove to be an endless source of trouble and annoyance, and that after every severe lightning storm, the circuit would be out of commission until a lineman could be sent over it.

TELEPHONE INSPECTORS.

On the C.P.R. we have one telephone inspector for 250 to 300 miles of circuit, with his headquarters approximately in the centre. Up to the present we have not found it necessary to provide the inspectors with motor cars, but, personally, I believe that every inspector should have a light motor car, particularly in sections where there are comparatively few trains. Our inspectors are supposed to be continually on the move. I consider that an inspector's duty is not so much to remove interruptions, as to prevent them occurring.

TRAIN TELEPHONE SETS.

On every section where we install telephone train dispatching circuits we equip every train with a telephone outfit, without selectors. The wrecking cars are provided with howler receivers, by means of which the dispatcher can call them in on the line if necessary. The connecting pole we use is the invention of J. F. Richardson, Superintendent of Telegraphs, C.P.R. British Columbia Division. It is so arranged that connection can be made with any two wires on the line, no matter whether they are on the same arm or not. We do not install any equipment at outlying sidings, as the train equipment answers every purpose should a train become stalled anywhere. On account of the severity of our climate during a portion of the year, no one could use a telephone at a pole box, and each outfit contains sufficient flexible twin wire to lead the circuit into the baggage car or conductor's caboose.

Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time, we wish our readers to distinctly understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

The Ohio Brass Co., Mansfield, Ohio, has distributed its new general catalogue 12, which contains a listing of all the company's lines, including catenary materials, 1,500 volt materials, 750 volt overhead material, rail bonds, third rail insulators, O-B high tension insulators and car equipment specialties. The catalogue is bound in cloth and contains 490 pages, which include, besides the listing of the different devices, considerable data relative to construction schemes.

The Canadian Westinghouse Co. has secured a contract from the Shawinigan Water and Power Co., Shawinigan Falls, Que., for one 15,000 k.w. 2 bearing water wheel type, 60 cycle generator, which is said to be the largest water wheel generator to be installed in Canada. This will be the third unit which the Westinghouse Co. will have furnished from its Hamilton shops for the Shawinigan Co.'s new power house, the other two units being of slightly smaller capacity, viz., 14,000 k.w.

J. J. Gartshore, Toronto, who some time ago purchased the rails, etc., of the Opeongo Logging Ry., a line of 14 miles running north from Whitney, Ont., to Lake Opeongo, has disposed of all the rails, etc., except of about three miles, and the whole of the material has been lifted. The rails, which are principally 56 lbs. per yard, have seen considerable service, but are still in good condition. Mr. Gartshore advises that the demand for light rails and contractors' equipment generally has been very active during the past few months, owing to the large railway contracts which have been given out.

"The Use of Highly Superheated Steam in Locomotive Practice," an illustrated 28 page booklet, has recently been distributed by the Locomotive Superheater Co., 30 Church St., New York. In it, the development and present day practice in the use of highly superheated steam are outlined, the valuable feature of the booklet lying in the fact that the information contained is for the most part data obtained from outside sources, and consequently, does not savour strongly of the standard type of catalogue. The different types of superheaters made by the company are described in their application to all types of locomotives, incidentally devoting some space to the matter of applying superheaters to existing locomotives.

Transportation Conventions in 1912.

Aug. 15.—International Railroad Master Blacksmiths' Association, Chicago, Ill.

Aug.—Travelling Engineers' Association.

Sept. 9.—International Association of Ticket Agents, Muskoka, Ont.

Sept. 10-13.—Roadmasters' and Maintenance of Way Association, Buffalo, N.Y.

Sept. 10-13.—Master Car and Locomotive Painters' Association of United States and Canada, Denver, Col.

Sept. 12.—American Association of General Passenger and Ticket Agents, Seattle, Wash.

Oct.—American Railway Bridge and Building Association, Baltimore, Md.

Oct. 7-11.—Association of Transportation and Car Accounting Officers, Chicago, Ill.

Oct. 7-11.—American Electric Railway Association, Chicago, Ill.

Oct. 8-9.—Canadian Ticket Agents' Association, Ottawa, Ont.

Oct. 15-17.—American Railway Bridge and Building Association, Baltimore, Md.

Oct. 17-19.—American Association of Dining Car Superintendents, Denver, Col.

Oct. 23-25.—Society of Railway Financial Officers, Atlantic City, N.J.

Nov. 6-10.—Association of Railway Electrical Engineers, Chicago, Ill.

Nov. 15.—American Railway Association, Chicago, Ill.

Nov. 15-16.—American Association of Freight Traffic Officers, Chicago, Ill.

Nov. 19-21.—Maintenance of Way Master Painters' Association, Chicago, Ill.

Dec. 12-13.—Association of Transportation and Car Accounting Officers, Louisville, Ky.

Railway and Allied Associations, Clubs, Etc.

The names of persons given below are those of the secretaries.

CANADIAN CAR SERVICE BUREAU, J. E. Duval, 401 St. Nicholas Building, Montreal.

CANADIAN FREIGHT ASSOCIATION (Eastern Lines), A. E. Rosevear, Canadian Express Bldg., Montreal.

CANADIAN FREIGHT ASSOCIATION (Western Lines), W. E. Campbell, 502 Canada Building, Winnipeg.

CANADIAN RAILWAY CLUB, J. Powell, St. Lambert, Que. Meetings at Montreal 2nd Tuesday each month, 8.30 p.m., except June, July and August.

CANADIAN SOCIETY OF CIVIL ENGINEERS, C. H. McLeod, 413 Dorchester St. West, Montreal.

CANADIAN STREET RAILWAY ASSOCIATION, Acton Burrows, 70 Bond Street, Toronto.

CANADIAN TICKET AGENTS' ASSOCIATION, E. de la Hooke, London, Ont.

CENTRAL RAILWAY AND ENGINEERING Club of Canada, C. L. Worth, 409 Union Station, Toronto. Meetings at Toronto 3rd Tuesday each month, except June, July and August.

EASTERN CANADIAN PASSENGER ASSOCIATION, G. H. Webster, 54 Beaver Hall Hill, Montreal.

ENGINEERS' CLUB OF MONTREAL, R. W. H. Smith, 9 Beaver Hall Square, Montreal.

ENGINEERS' CLUB OF TORONTO, R. B. Wolsey, 94 King St. West, Toronto.

NOVA SCOTIA SOCIETY OF ENGINEERS, A. R. McCleave, Halifax, N.S.

QUEBEC TRANSPORTATION CLUB, J. S. Blanchet, Quebec.

WESTERN CANADA RAILWAY CLUB, W. H. Rosevear, 25½ Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month except June, July and August.

Department of Railways and Canals, Canada

HUDSON BAY RAILWAY.

Notice to Contractors.

SEALED TENDERS addressed to the undersigned and endorsed "Tender for construction of Hudson Bay Railway," will be received at this office, until 16 o'clock, on Thursday, the 1st of August, for a section of about 68 miles from Thicket Portage to Split Lake Junction.

Plans, specifications and form of contract to be entered into can be seen on and after Friday, June 7th, at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, and at the office of the Chief Engineer of the Hudson Bay Railway, Winnipeg, at which places forms of tender may be obtained.

Parties tendering will be required to accept the fair wages schedule prepared or to be prepared by the Department of Labor, which schedule will form part of the contract.

Contractors are requested to bear in mind, that tenders will not be considered, unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $150,000.00 made payable to the order of the Minister of Railways and Canals, must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work at the rates stated in the offer sumbitted.

The cheques thus sent in will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security, for the due fulfilment of the contract to be entered into.

By order,
L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, 7th June, 1912.

Newspapers inserting this advertisement without authority from the Department will not be paid for it.—23884.

KINGSTON AND PEMBROKE RAILWAY COMPANY.

Notice to Shareholders.

The Annual General Meeting of the Shareholders of the Kingston and Pembroke Railway Company for the election of directors and the transaction of business generally, will be held at the Head Office of the Company in the City of Kingston, on Wednesday 14th day of August next, at the hour of 11.00 o'clock in the forenoon.

The meeting will be made special for the following purposes, namely:—

1. To consider whether it is expedient to lease this Company's Railway to the Canadian Pacific Railway Company, and if so, to approve of the terms, conditions and form of lease.

2. To consider and decide upon the means to be adopted for raising funds to retire outstanding mortgage debentures and for other purposes of the Company, and if an issue of bonds be decided upon, then to fix the respective amounts thereof, the rate of interest, and the other terms upon which they shall be issued and to approve the form of mortgage (if any) to be given to secure re-payment of the said bonds.

The Stock Transfer Books will close in New York on Saturday, 3rd, August, 1912. All books will be re-opened on Thursday, 15th day of August, 1912.

A. McNAUGHTON,
Secretary.

Kingston, Ont., July 11th, 1912.

PATENT RIGHTS FOR SALE.

Patent Act. Take notice, that the undersigned are prepared to supply, at a reasonable price, sheet metal dumping cars for railroad contractors' use, described in Canadian Patent No. 116,277, or to grant anyone desiring to use the same a license to have the same manufactured for him at a manufacturing establishment in the Dominion of Canada. They are also prepared to receive offers for licenses to manufacture and sell under the same. Ridout & Maybee, Manning Chambers, Queen Street West, Toronto, attorneys for the Goodwin Car Company.

TENDERS

TENDERS, addressed to the undersigned at Ottawa, and endorsed on the envelope, "Tender for Customs Steamer," will be received up to noon of the

Second Day of September. 1912.

for the construction of a Twin-screw Steel Steamer for Customs Service on the Atlantic Coast, to be delivered at the port of Quebec, of the following leading dimensions, namely: Length, between perpendiculars, 185 feet; breadth, 32 feet; draught, 10 feet 6 inches, and speed, 15 knots per hour.

Plans and specifications of this steamer can be seen at the Department of Customs, Ottawa, and at the offices of the Collectors of Customs, Toronto, Collingwood, Montreal, Quebec, St. John, N.B., and Halifax, N.S.

Plans and specifications can be procured upon application to the Commissioner, Department of Customs, Ottawa.

Each tender must be accompanied by an accepted bank cheque in favor of the Commissioner of Customs, equal to ten per cent. of the whole amount of the tender, which cheque will be forfeited if the successful tenderer declines to enter into a contract with the Department, or fails to complete the steamer.

Cheques accompanying unsuccessful tenders will be returned.

The Department does not bind itself to accept the lowest or any tender.

Newspapers copying this advertisement without authority from the Department will not be paid.

JOHN MCDOUGALD,
Commissioner of Customs.

Department of Customs,
Ottawa, 19 July, 1912. —26162

J-M ASBESTOS & MAGNESIA RAILROAD SUPPLIES

Roofings	Locomotive Lagging	Pipe Coverings	Electrical Supplies
Shingles	Air Brake Cylinder	Smoke Jacks	Overhead Line Material
Packings	Packing Expander Ring	Asbestos Wood	Rail Bonds and Tools
Gaskets	Underground Conduit	Fibre Conduit	"Noark" Fuse Devices
Hair Felt	Leak-No Metallic Compound	Insulation	Fuse, Service and Subway Boxes,
Cements	Fire Extinguishers	Metal Polish	etc., etc.

Write Nearest Branch for Catalog No. 252.

THE CANADIAN H. W. JOHNS-MANVILLE CO., LIMITED

Toronto, Ont. London, Ont. Montreal, Que. Winnipeg, Man. Vancouver, B.C.

Ticket Agents Connecting Lines

Please Note that the

ILLINOIS CENTRAL — CENTRAL MISSISSIPPI VALLEY ROUTE — RAILROAD

Carries Through Sleeping Cars, Free Reclining Chair Cars or Coaches to

CHICAGO	MEMPHIS
ST. LOUIS	NEW ORLEANS
OMAHA	HOT SPRINGS
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True Southern Route to Pacific Coast.
Through Trains Electric Lighted.

G. B. WYLLIE, Canadian Pass. Agent,
202A Ellicott Square, Buffalo, N.Y.

The James Smart Mfg. Co.

Limited

Brockville, Ontario - - Canada

Headquarters for Railway Supplies as Under:

Locomotive and Car Jacks Traversing Jacks Ball Pein Machinists Hammers
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Machinists' Vises Well and Cistern Pumps Station Seats Freight Trucks
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Complete Catalogues Furnished **Prompt Quotations**

HEAVY FORGINGS

Best Open Hearth Steel
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MARINE	LOCOMOTIVE
CRANK SHAFTS	AXLES
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CONNECTING RODS	GUIDE BARS

Canada Forge Company, Limited

WELLAND, ONTARIO

Drop Forged Turnbuckles

ALL KINDS OF SPECIAL DROP FORGINGS

Send Models of Blue Prints for Estimates.

Machine Wrenches
Screw Drivers
Pliers
Structural Wrenches
Track Wrenches
Eye Bolts
Lathe Dogs
Journal Box Wedges
Etc.

Canadian Billings & Spencer, Limited

WELLAND, ONT.

TENDERS for Steamship Service between Canada, the British West Indies and British Guiana and between Canada and Jamaica.

1. Tenders for mail, cargo and passenger steamship services are invited between—

(a) Canada, the British West Indies and British Guiana, and between
(b) Canada and Jamaica,

and will be received at the office of the Minister of Trade and Commerce, Ottawa, Canada, until noon on the First day of October, nineteen hundred and twelve.

2. Tenders are to be sent in sealed envelopes addressed to the Minister of Trade and Commerce, and to be marked respectively "Tenders for Steamship Service between Canada, the British West Indies and British Guiana" and "Tenders for Steamship Service between Canada and Jamaica," and, if submitted through the post, should be registered.

3. The respective services shall consist of such sailings as may be hereafter determined according to the various descriptions of the alternative services on the two routes for which tenders are requested.

CANADA, BRITISH WEST INDIES, AND BRITISH GUIANA.

4. Tenders are invited for one or more of the following Services, sailing every ten days or every 12 days (as may be submitted in the proposals), from the Canadian port of departure hereinafter designated to Georgetown, and calling each way, or such variation thereof as may be stated in the proposals, at the following islands in the British West Indies, viz.:—

St. Kitts, Antigua, Montserrat, Dominica, St. Lucia, St. Vincent, Barbados and Trinidad:—

(a) Sailing from Halifax to Georgetown and returning to Halifax.
(b) Sailing from St. John to Georgetown and returning to St. John.
(c) Sailing from Halifax to Georgetown and returning to St. John and Halifax.
(d) Sailing from St. John to Georgetown and returning to Halifax and St. John.

5. Tenders are also invited for a monthly Service from Montreal, during the season of navigation in the St. Lawrence River, to Georgetown, calling each way at Quebec and the West Indies Islands or such variation thereof as designated in paragraph 4, the service referred to in this paragraph to be combined with one of the services described in the said paragraph 4.

6. Permission will be given to call at any British port in the West Indies on either North or South-bound voyages, and the Contractor shall also have the option of calling at any of the foreign islands in the West Indies for the sole purpose of discharging Canadian cargo.

CANADA—JAMAICA.

7. Consideration will also be given to the proposals submitted by tenderers for alternative services of 10, 12 and 15 knots average speed, with steamships having a tonnage of from 1,600 to 3,000 net tons.

8. Tenders are also invited for one or more of the following Services sailing from the Canadian port of departure hereinafter designated every 7, 10 and 12 days (any one or all of which may be submitted in the proposals), to Jamaica, calling each way at Bermuda:—

(a) Sailing from St. John to Jamaica and returning to St. John;
(b) Sailing from Halifax to Jamaica and returning to Halifax.
(c) Sailing from St. John to Jamaica and returning to Halifax and St. John.
(d) Sailing from Halifax to Jamaica and returning to St. John and Halifax.
(e) Sailing alternately from St. John and Halifax to Jamaica and returning to one of the said ports other than last port of departure.

9. Consideration will also be given to proposals submitted by tenders for alternative services of 12 and 15 knots average speed, with steamships having a tonnage of from 1,600 to 3,000 net tons.

GENERAL CONDITIONS.

10. Tenders are invited for such Service or Services on the respective routes as may be stated in the proposals in any way varying the ports of departure, ports of call, or frequency of sailing of the various services described in paragraphs 4 to 9 inclusive, it being the desire of the Minister to have as wide a range of Service tenders as possible so that he may be able to select one for each of the routes which is best adapted to the requirements in point of efficiency and practicable cost.

11. Tenders may be submitted for any or all the services described in the foregoing for 5, 10 and 15 years respectively.

12. Tenders must state:

a) The registered gross and net tonnage and passenger accommodation of the steamships to be employed, and
(b) the average speed of such steamers, and
(c) the period of round voyage for the service or services proposed, and
(d) the annual subsidy required therefor, and
(e) the date upon which the Contractor will be in a position to supply the service or services tendered for.

13. Preference will be given, other conditions being equal, to the tenderer providing the most satisfactory conditions vide paragraph 12, and also as to cool air chambers, insulation for protecting fruit, etc.

14. The vessels to be employed shall be of the class A1, and be of British register, and be capable of maintaining a minimum speed of 12 knots when loaded at sea under ordinary weather conditions.

15. The Contractor is to land and embark all mails at terminal points and ports of call at his own expense.

16. The Contractor shall be subject to such general conditions as are incidental to all similar steamship contracts granted by the Canadian Government.

17. The Minister shall have the power to prescribe the maximum freight and passenger rates and provide that no discrimination shall be made against Canadian importers or exporters.

18. The Minister does not bind himself in either case to accept the lowest or any tender.

(Sgd.) F. C. T. O'HARA,
Deputy Minister of Trade and Commerce.

Department of Trade and Commerce,
Ottawa, June 8, 1912.

Note.—(a) The present contract for a steamship service between Canada, the British West Indies and British Guiana expires July 1, 1913.

(b) There is no contract existing at present for a service between Canada and Jamaica.

The insertion of this advertisement unauthorized will not be paid for.—24043.

MALLEABLE IRON CASTINGS

Galt Malleable Iron Co., Limited - - Galt, Ontario

Sessions-Standard
Friction Draft Gear
Simplest and Best.

Both Made by
Standard Coupler Co.
2 RECTOR STREET, NEW YORK.

Standard Steel Platforms
Used by all Canadian Railways

JAMES PLAYFAIR, Pres. & Gen'l. Mgr. D. L. WHITE, Vice-President. J. W. BENSON, Sec'y-Treas.

Midland Towing & Wrecking Co., Limited, Midland, Ont., Canada

FIRST-CLASS TUGS FOR WRECKING, RAFT TOWING, ETC.
STEAM PUMPS, DIVERS, JACKS, HAWSERS AND LIGHTERS.

J. S. COFFIN, President SAMUEL G. ALLEN, Vice-President C. L. WINEY, Sec. & Treas.

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Specialists in Devices that Make for Economy

Main Office: 30 Church Street, New York.
San Francisco Office: 795 Monadnock Bldg.
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CRANES AND HOISTS

NORTHERN CRANE WORKS, Limited
Walkerville, Ontario.

Car Closets
FLUSH OR DRY
DUNER CO. 101 S. Clinton St. Chicago

POSITION WANTED.

Technical Graduate, experienced in all classes of freight and passenger equipment in plant office and engineering, will make permanent change to company offering good opening. Apply box 117 S., The Railway and Marine World, Toronto.

Dominion Coal Company, Limited

Operating Collieries in Cape Breton, and Cumberland Counties, Nova Scotia.
Output 4,500,000 Tons Yearly

DOMINION STEAM AND GAS COALS

Screened, Run of Mine and Slack

SPRINGHILL COAL

Screened, Run of Mine and Slack

Used by Railways, Tramways, Steamships, Manufacturers, Water Works, Light and Power Stations in Ontario, Quebec and the Maritime Provinces, also in Newfoundland and the New England States, Mexico, Sweden, South Africa and the West Indies.

BUNKER COAL Unsurpassed facilities for bunkering ocean going steamers at Sydney and Louisburg, C.B., Halifax, N.S., St. John, N.B., and Montreal, P.Q.

Shipping Ports: Sydney and Louisburg, C. B., and Parrsboro, N. S.

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Richelieu & Ontario Lines

Niagara Navigation Company, Limited

CONNECTING

Toronto - Niagara Falls - Buffalo
Toronto-Hamilton
Toronto-Olcott Beach

Ticket Office:

46 Yonge St., Cor. Wellington Street

TORONTO

Electric Headlight Saves Train

(From Daily Papers)

"Wednesday night B———forgot to deliver an order to hold Eastbound Passenger Train, No 6, and only the fact that the Electric Headlight of the oncoming Passenger train was seen at a great distance by the Engineer of the Westbound Freight prevented a head end collision in the———Canyon near———. The warning light was seen in time to enable the freight to get back on to the siding at———."

PYLE-NATIONAL ELECTRIC HEADLIGHT CO.

CHICAGO

PRESERVE YOUR TIMBER BY CREOSOTING

YOU WILL SAVE MONEY

Railway Ties, Bridge Timbers, Piles, Poles, Cross Arms, Plank Sidewalks, Wharf Timbers, Crib Work, Wood Paving Blocks, &c., &c., can all be successfully treated by the creosoting process to resist decay.

THE DOMINION TAR & CHEMICAL CO., LTD. HAVE CREOSOTING PLANTS

at North Transcona, near Winnipeg, Man., and Sydney, Nova Scotia.

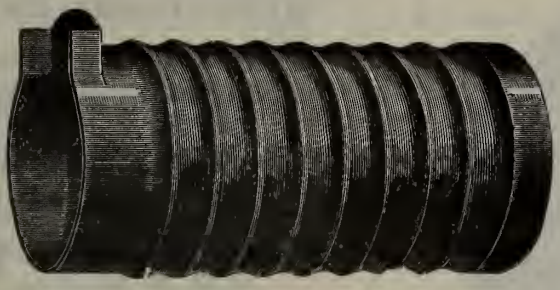
The Dominion Tar & Chemical Co. is also prepared to carry out any

OTHER PRESERVATIVE TREATMENTS OF TIMBER

MORISON Suspension Furnaces

The Universally satisfactory record of "THE MORISON" proclaims it the best furnace made.

With Plain Ends or Flanged to any required shape.



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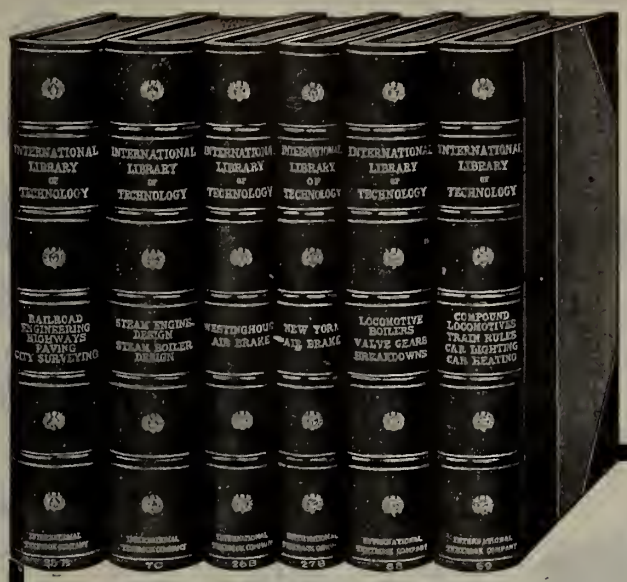

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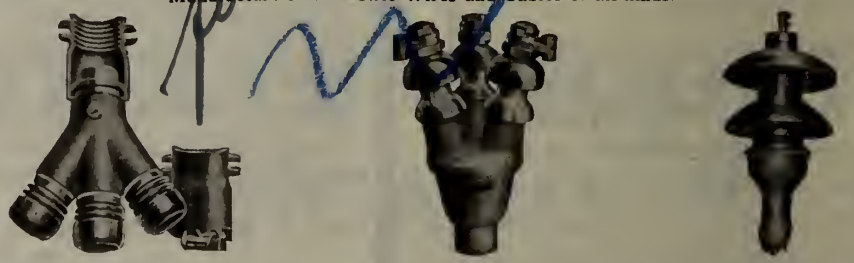

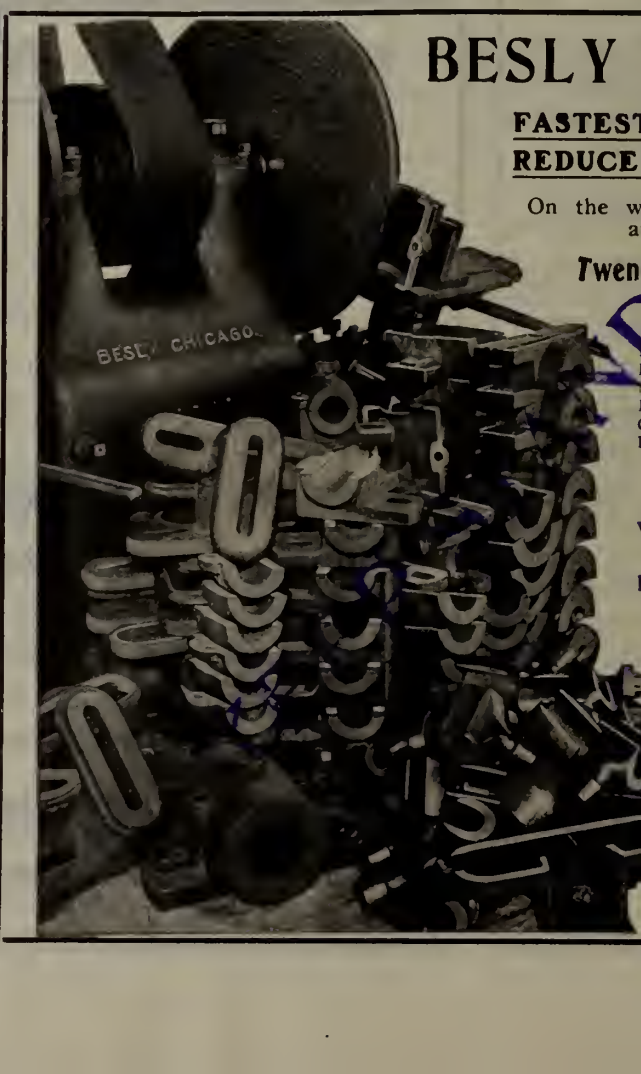

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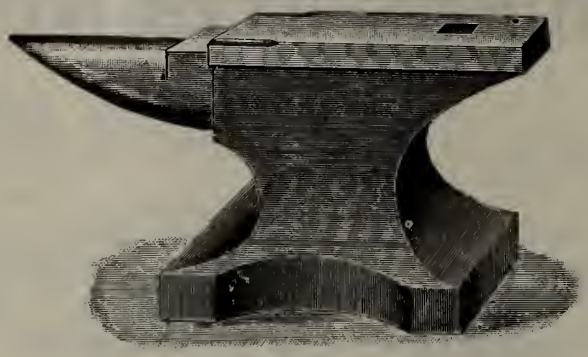

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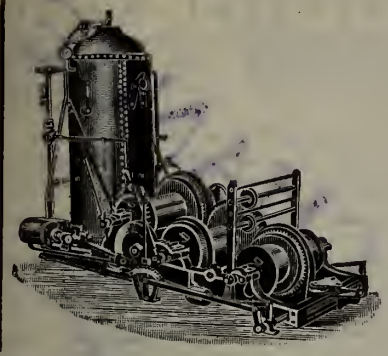

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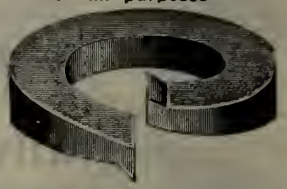

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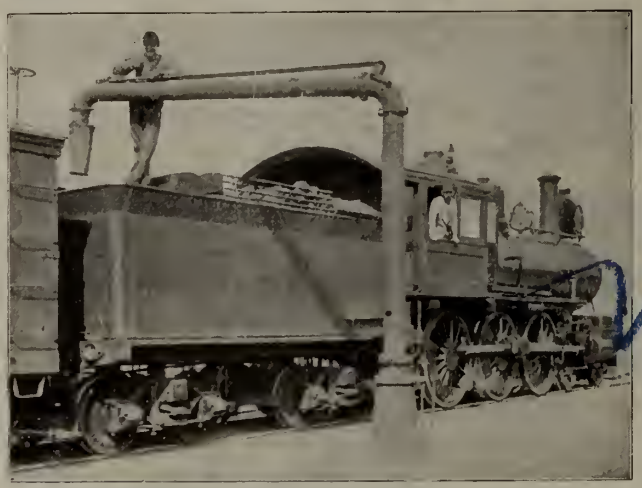

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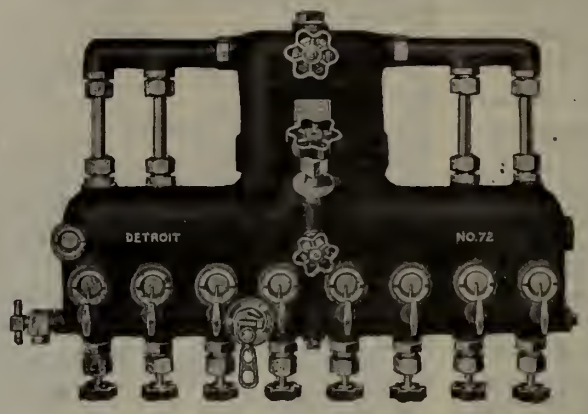

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LIMITED
CAR BUILDERS
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Canadian Railway AND Marine World

ESTABLISHED 1898.

Number 175. TORONTO, CANADA, SEPTEMBER, 1912. Subscription Rates, Page 457.

Imperial Wire & Cable Company, Limited

Successors to THE WIRE AND CABLE COMPANY, MONTREAL

Electrical Wires and Cables for all Purposes—Paper and Rubber Insulated Lead Covered Cables; Rubber Covered Wire; Weather-Proof Wire; Flexible Lamp Cord; Bare Copper Wire, Etc.

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The Northern Electric and Manufacturing Co., Limited

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SAXBY & FARMER, LIMITED LONDON, ENG.

RAILWAY SIGNALS AND SAFETY APPLIANCES, SIGNALLING AND INTERLOCKING WORK OF EVERY DESCRIPTION, ELECTRICAL AND MECHANICAL.

CANADIAN BRANCH: 611 Canadian Express Building, McGill St., MONTREAL

ENAMELED IRON SIGNS

For Steam and Electric Railways, Express, Telegraph and other purposes.

ACTON BURROWS LIMITED, TORONTO

Dominion Steel Castings Company, Limited

Acid Openhearth for heavy machinery and locomotive castings.

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Stock Process for Automobile and miscellaneous light steel castings.

Railway Signal Co. of Canada, Limited

GENERAL OFFICE AND WORKS, : LACHINE, P. Q.

Makers of Standard Appliances as Approved by Railway Signal Association and Board of Railway Commissioners.

THE PRESTON **Car & Coach Co.** Limited

PRESTON, ONT.

Manufacturers of

Steam and Electric Railway Cars and Special Cars

"PALMETTO"

is the standard packing for

Air Pumps, Throttle Valves, Small Valves, Ree Working Steam Joints

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Sole Manufacturers, 109 Duane St., New York

CHANGE

CANADIAN FAIRBANKS Co., LTD., Canadian Agents

Montreal, Toronto, Winnipeg, Calgary, Vancouver

THE OTTAWA CAR CO. Limited

BUILDERS OF

Electric Cars, Fine Carriages, Wagons, Sleighs, Etc.

Office and Works: Slater St., OTTAWA

SMALL TOOLS

PRATT & WHITNEY CO.

of Canada, Limited

DUNDAS ONTARIO

FOR TICKET CASES AND COMMERCIAL FURNITURE

of all descriptions to stock or special design, apply to

The Canadian Office and School Furniture Co., Limited

Preston Ontario

BRASS TUBING

Prompt delivery from stock

CHANGE

HAMILTON ONT.

The DOUGALL VARNISH CO., Limited

VARNISHES of Finest Quality

MONTREAL

Associated with Murphy Varnish Co., U.S.A.

CANADA

CHANGE

LINGERWETT

Canned Lightning for quick and easy stripping of varnished or painted surfaces. Harmless to wood or health.

KONKRETO

A composition for the sanitary treatment of concrete or cement.

Index to Advertisers, Page 56. Purchasing Agents' Guide, Page 49.

Westinghouse Portable Air Compressor with Alternating Current Motor

Westinghouse

Portable Motor Driven Air Compressors

THE simplicity and compactness of these outfits recommends them particularly for general use in car barns, power houses, railroad yards and shops where cleaning or drying is done by compressed air.

The reservoirs and motor compressor are firmly attached to the truck, together with the necessary switch, governor, fuses, etc. These portable outfits are furnished for either direct or alternating current operation on all commercial voltages.

CHANGE

Canadian Westinghouse Co., Ltd., Hamilton, Ont.

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Steam Turbines and Generators

These Steam Turbo-Generator Units are built in three styles, from 300 K.W. to 20,000 K.W

1. High Pressure Condensing.
2. High Pressure Non-Condensing.
3. Low Pressure Condensing.

CHANGE

Bulletin 1079

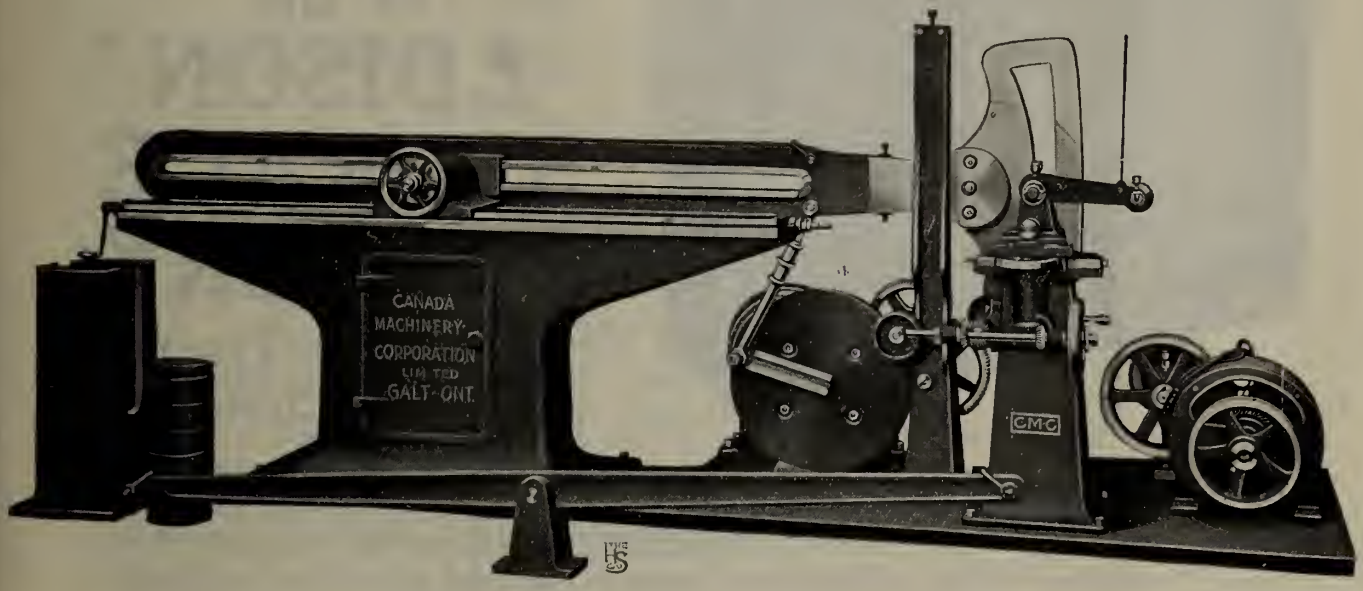
describing the construction of the units, will be sent on application to our nearest sales office: Montreal, Toronto, Cobalt, Winnipeg, Calgary, Vancouver.

ALLIS-CHALMERS-BULLOCK

LIMITED

Sales Office: MONTREAL TORONTO WINNIPEG VANCOUVER

LINK CMC GRINDER



LOCOMOTIVE LINK GRINDER

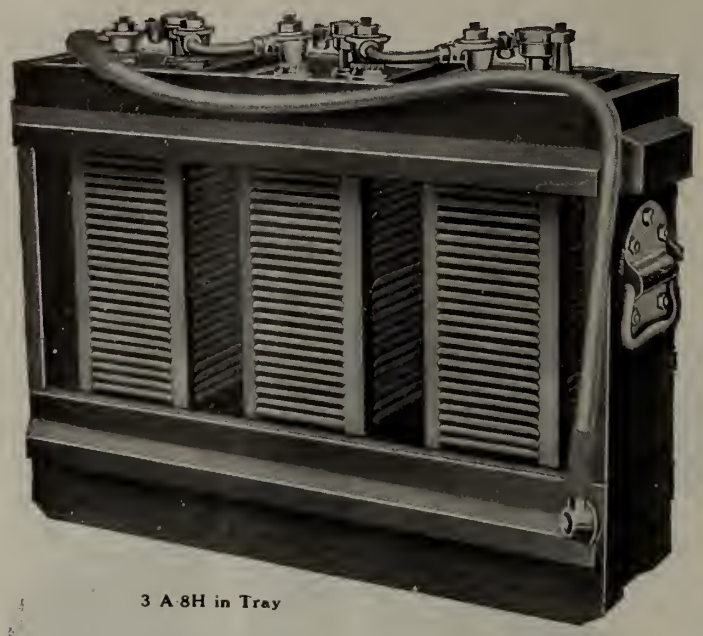
THE construction and design of our Locomotive Link Grinder simplifies the rapid and economical grinding of Locomotive Valve Links to an accurate radius. We should be pleased to have you investigate this construction and design.

BULLETINS AND PRICES WITH FULL INFORMATION ON REQUEST.

CANADA MACHINERY CORPORATION

LIMITED

GALT, ONTARIO



3 A-8H in Tray

The Advantages of the EDISON STORAGE BATTERY

For Axle Train Lighting Systems

The peculiarities of the axle generator system of train lighting, due to the necessities of transportation, are such that a storage battery is manipulated in anything but a normal manner. Sulphation, buckling, failure through overcharge, and rapid deterioration through idleness, when partially discharged, are factors which militate against the life and usefulness of the lead cell with this system.

Sulphation, for example, causes high voltage indications, rendering the automatic features of modern axle lighting systems inoperative at such times as would give false indications of fully charged batteries.

The Edison battery will retain its original capacity no matter how the output of the axle generator fluctuates or how quick the rate of discharge, and it will remain in a discharged condition for an unlimited length of time without any deterioration. Unlike the lead cell, Edison plates have the same dimensions from the time they are put into service to the end of their useful life.

The great physical strength of Edison battery construction enables it to resist continued vibration and concussion.

Saving in weight for the same ampere hour capacity is another big advantage of the Edison battery for every type of train lighting system. The amount of money saved in haulage costs alone would establish the economy of this battery for train lighting, even if it did not possess a single one of the notable advantages mentioned above. On a 32 volt system, this battery saves one ton per installation. This annually amounts to 108,000 ton miles per car.

Send for our newest bulletin, No. 1018, "*Edison Train Lighting Batteries.*"

The Canadian Fairbanks-Morse Company
Limited

Montreal St. John Ottawa Toronto Winnipeg Saskatoon Calgary Vancouver Victoria

Galena-Signal Oil Company

Franklin, Pa., and Toronto, Ont.

Sole manufacturers of the celebrated GALENA COACH, ENGINE and CAR OILS, and SIBLEY'S PERFECTION VALVE and SIGNAL OILS.

GUARANTEE COST per thousand miles for from one to five years, when conditions warrant it.

Maintain EXPERT DEPARTMENT, which is an organization of skilled railway mechanics of wide and varied experience. Services of Experts furnished free of charge to patrons interested in the economical use of oils.

STREET RAILWAY LUBRICATION A SPECIALTY

USE

Galena Railway Safety Oil "B"

in Marker and Classification Lamps, to secure Efficiency of Service, Maximum Candle Power, Clearness of Light.

Galena Long Time Burner Oil

for use in Switch and Semaphore Lamps, and all lamps for long time burning, to avoid smoked and cracked chimneys and crusted wicks.

Tests and correspondence solicited.

S. A. MEGEATH,

PRESIDENT

What is

CHANGE

JOURNOLENE?

It is an Asbestos Lubricant for Journals of all kinds of Railroad Trucks.

It is THE SUCCESS of the Age. We will prove it to you, as it is proved to others who have adopted it.

Write us. We will heal your troubles with Journals.

The Railway Asbestos Packing Company, Limited

SHERBROOKE, QUE.

Toronto Office : 117 Mail Building, King Street.

TITANIUM RAILS WIN OUT ON BOSTON ELEVATED

The service on the Boston Elevated is said to be the severest in the world. Note how test proved superior durability of open-hearth Titanium rails laid alternately with plain open-hearth rails.

CONDITIONS OF TEST

All rails A.S.C.E. Section 85lbs per yard.
Laid April 1st, 1911.
Measured October 31st, 1911.
In service when measured, 214 days

Average wear in square inch (for all rails)

	Open-Hearth	Titanium Open-hearth
In 214 days	.755	.537
Per 1,000,000 tons (approximately)	.0686	.0488

Test rails laid alternately on high side of track.
Radius of curve, 100 feet.
Grade, 5 per cent. down.
Track elevation, 3 inches.

Ratio of Wear
For all Rails
Titanium to Open-hearth
1 to 1.41

Titanium rails cost only about $2 more per ton than untreated rails. When you order, specify that our men shall look after the Titanium addition. On this condition we will make no charge for their services.

TESTS ON SOME OTHER ROADS

Boston & Maine 55% to 186% . in favor of Titanium Rails.
(Showing, that as the trial continues, the figures improve in favor of Titanium as evidenced by previous measurements already published)
Lehigh Valley 54% . . . in favor of Titanium Rails.
Baltimore & Ohio 56% . . . in favor of Titanium Rails.

Booklet No. 22 explains in detail the superiority of Titanium-treated iron and steel. Rail diagrams of above tests gladly sent on request.

Output of Titanium Steel in 1910 was 326,300 gross tons.
Output of Titanium Steel in 1911 increased to 410,600 gross tons.

Titanium Alloy is made for Canadian Consumption by Electro Metals, Ltd, Welland, Ont.

TITANIUM ALLOY MANUFACTURING COMPANY

Manufactured in Canada Under Rossi Patents. Processes and Products Fully Patented.

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Los Angeles, San Francisco, Portland

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H. H. COOK, District Agent.
Peoples Gas Building,
Chicago, Illinois.

THE PRIMOS CHEMICAL CO.,
Primos, Deleware County,
Pennsylvania

C. G. E. Gas Electric Cars

The Gas Electric Car

Electricity is the silent and efficient transmission link, furnishing power and brilliant illumination.

Is materially reducing operating costs and increasing traffic on branch railway lines wherever used.

The records of thousands of miles of operation in actual service prove the usefulness and reliability of this car.

Built as a Railroad Proposition

Strong, reliable, efficient and attractive. M. C. B. throughout. Just as the trolley car successfully displaced the horse car, so with equal success and profit the C. G. E. Gas Car is now replacing branch line trains.

Catalogue 4855 illustrates and describes the equipment and shows many car body designs. This will be sent you by return mail for the asking.

Canadian General Electric Co.

Limited

Toronto Montreal Halifax Ottawa Cobalt
Winnipeg Calgary Vancouver Nelson Prince Rupert

THE
STEEL COMPANY OF CANADA
LIMITED

Railroad Track Equipment

Angle Bars Tie Plates

Steel Track Spikes Bolts & Nuts

PIG IRON

Foundry Basic Malleable

Car Axles and Forgings

Invincible Fencing

Bar Iron Bar Steel

Arm Braces Wood and Machine Screws

Copper Trolley Wire, Telephone and Galvanized Wire

Nails Tacks Wrought Pipe

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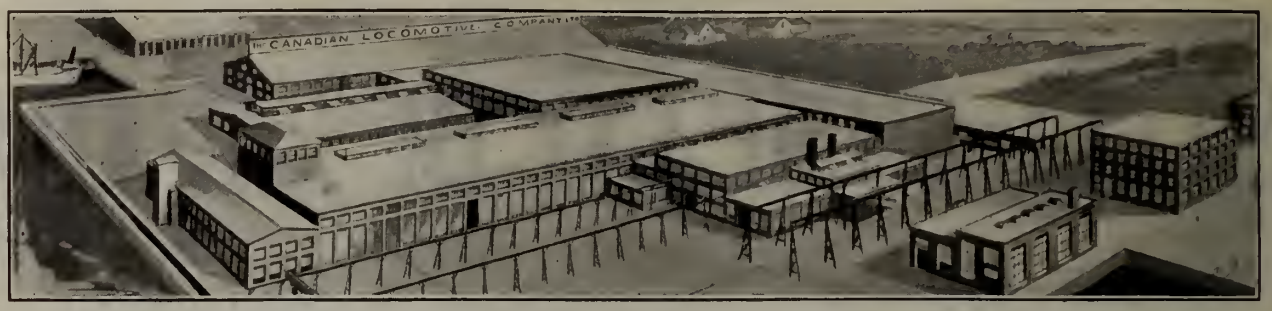
W. A. MacLennan, Vancouver, B.C.
J. B. H. Rickaby, Victoria, B.C.
H. G. Rogers, St. John, N.B.
Geo. D. Hatfield, Halifax, N.S.



Switching Locomotive built for Intercolonial Railway of Canada.

Total weight of engine in working order	144,000 pounds
Weight on drivers	144,000 pounds
Diameter of drivers	51 inches
Boiler pressure	200 pounds
Cylinders	20 x 26 inches
Maximum tractive power	34,500 pounds

CHANGE

Pacific Type Locomotive, built for the Temiskaming and Northern Ontario Railway.

Total weight of engine in working order	203,100 pounds
Weight on driving wheels	133,375 pounds
Diameter of driving wheels	69 inches
Boiler pressure	200 pounds
Cylinders	21 x 28 inches
Maximum tractive power	30,000 pounds

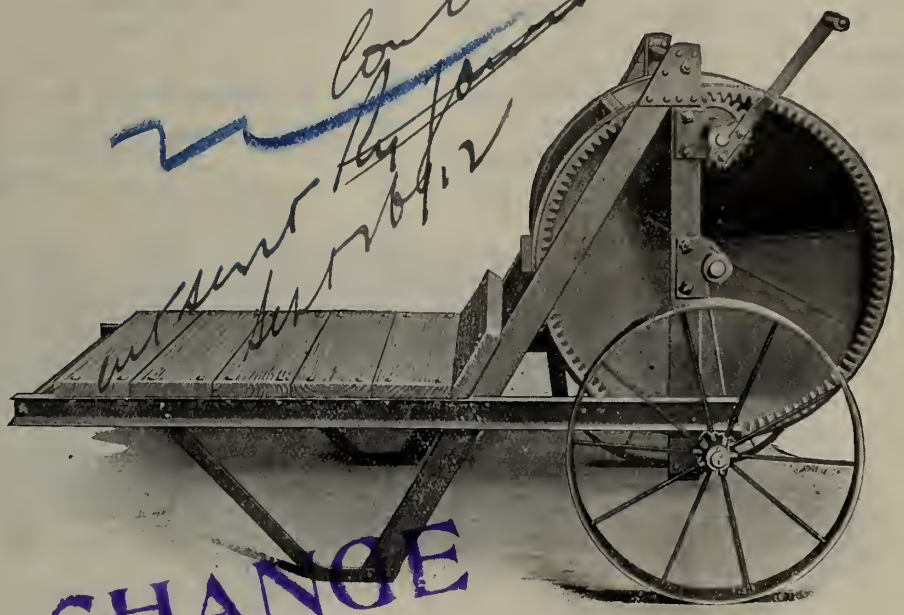
Canadian Locomotive Co., Ltd.

KINGSTON, ONTARIO

Save Time and Money

By Mixing Your Concrete for Those Small Jobs and Scattered Work with a

SMITH HAND MIXER



CHANGE

It takes only a small gang to keep it running; and, with two men on the crank, it is easy to turn out 30 cubic yards a day of first-class concrete. No wheeling away of mixed material. You merely dump it right into the forms.

EASILY MOVED BY ONE MAN

CATALOGUE SENT ON REQUEST

MUSSENS LIMITED

Head Office: MONTREAL

Branches: Toronto Cobalt Winnipeg Calgary Vancouver

Power Cost

is of Prime Importance in every factory.

We can positively demonstrate to **your** satisfaction that we can give you a 100% investment--Can prove it in dollars and cents.

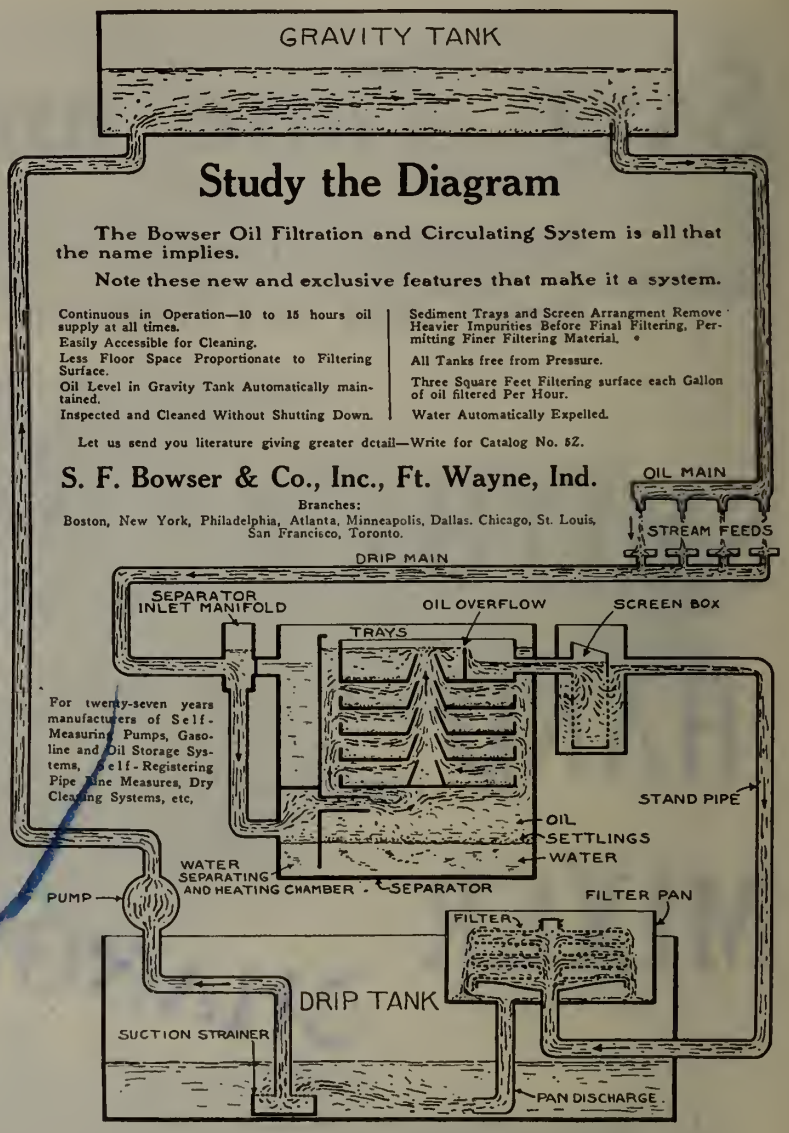
It is actually possible to save 60% per h.p. per year with a Bowser Oil Filtration and Circulating System.

Just a "nod" from you will bring the proof and it will incur no obligation.

Note The Formula

We give above the proper comparative basis on which to consider oiling systems. In this day every engineer or manager wants to know what he is buying. Don't accept somebody's statement that an oiling system will do certain things—Use the formula above and figure it out for yourself. Cut out the tables and file for reference.

When you buy a boiler you demand the amount of heating surface—On the same basis of reasoning, why not demand the amount of filtering surface in an oiling system.



The Bowser Oil Filtration and Circulating System

possesses the following exclusive features which account for its superiority:

Continuous Operation---10 to 15 hours' Oil Supply at all times.
Easily Accessible for Cleaning.
Less Floor Space proportionate to filtering Surface.
Oil level in Gravity Tank Automatically Maintained.
Inspected and Cleaned without shutting down.
Sediment Trays and Screen Arrangements remove heavier impurities before final filtering, permitting finer filtering material.
All tanks free from pressure.
Three sq. ft. Filtering Surface for Each Gallon of Oil per hour to be filtered.
Water automatically expelled.

Here's another reason for Bowser service and success: Our corps of engineers is ready to look over your plant and give expert advice, not only on a proper oiling system, but on other arrangements as well, that will improve your service and cut your cost. This special service is gratis, and does not obligate the enquirer in any way. All we want to know is that you are interested in reducing the cost of your power and engine room maintenance.

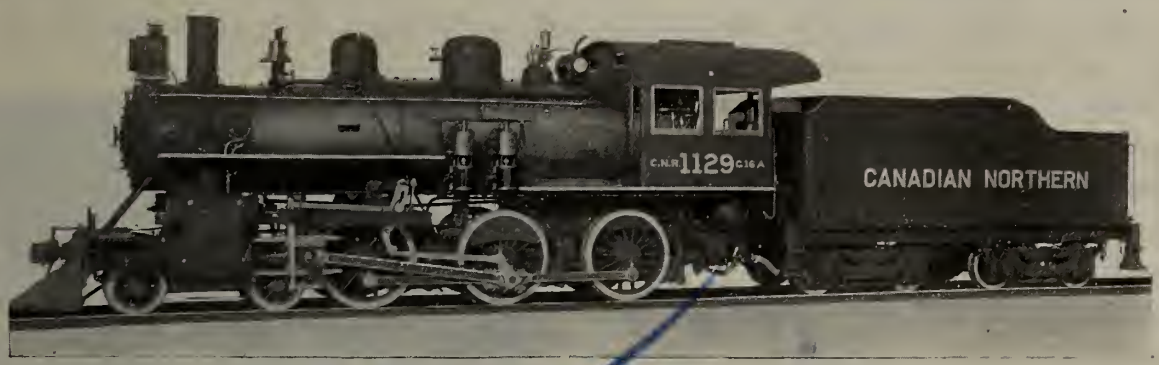
Ask for Catalogue No. 18.

S. F. BOWSER & COMPANY, Incorporated, Toronto, Ont.

66-68 Frazer Avenue.

TEN WHEEL LOCOMOTIVE

CANADIAN NORTHERN RAILWAY



Total weight of engine, 154,000 pounds.
Weight on drivers, 112,500 pounds.
Diameter of drivers, 57 inches.
Boiler pressure, 170 pounds.
Cylinders, 20 x 24 inches.
Maximum tractive power, 24,300 pounds.

MONTREAL LOCOMOTIVE WORKS, LTD.

DOMINION EXPRESS BUILDING, MONTREAL, CANADA.

A Perfect Cab Signal System!

THE SIMMEN SYSTEM

Approved by the Railroad Commission of the State of Indiana for Use in That State.

The Simmen System of Railway Signalling and Train Despatching is a cab signal system of remarkable simplicity, which has been proved successful at the highest speeds and under all possible weather conditions. All the advantages inherent in cab signal systems are fully realized in combination with an efficiency of the highest order. Visible light signals in the cab, "Clear" or "Danger," as the case may be, are continuous and positive, and the changes from one to the other vivid and unmistakable. The risk of missing fixed signals on the roadway in fog or snow storm is entirely obviated. Consequences of oversight thoroughly guarded against. Head-on collisions are prevented by interlocking of automatic electric switches on the Despatcher's table, and stop signals are displayed at a safe distance from sidings

False "Clear" signals are an impossibility, since any derangement of any circuit automatically causes the display of a red light. Third (contact) rails at every siding permit of telephone communication between cab of engine and Despatcher's office. Cost of installation much less than that of other systems and cost of maintenance practically nominal.

Despatcher's Table.

Full particulars and descriptive matter on application to

NORTHEY - PLUMMER, LIMITED

Confederation Life Chambers, - TORONTO

"Hart" Convertible Cars

are being used extensively by

Railroads and Contractors

Our "Hart" Cars can be used as follows:

Centre Dump Ballast Cars, Side Dump Construction Cars, Side Door Gondola Cars.

Capacities 30 to 50 tons. All Wood, All Steel or Composite Construction.

"Otis" Dump Cars

Can be used in a variety of services.

For Coal, Coke, Ore and General Service.

All capacities. All Wood or All Steel, also Composite Construction.

We would like to mail you booklet, illustrating and describing these cars in operation under all sorts of conditions.

THE HART-OTIS CAR CO., LIMITED

MONTREAL.

POLSON IRON WORKS, Limited

Steel Shipbuilders

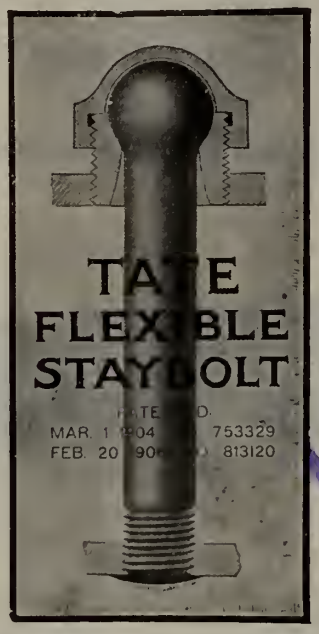
Engineers and Boilermakers

Dredges, Hydraulic and Dipper Type; Steel Steamers, full Canal Size; Tugs, Barges and Scows

Marine Engines and Boilers—all Sizes

Works and Office, Esplanade E., Toronto

TATE FLEXIBLE STAYBOLTS



Allow for and accommodate the forces of expansion and contraction along the lines of least resistance.

The Tate Bolt can be longitudinally adjusted to compensate for the difference of expansion of Outer Boiler Shell over Fire Box.

Over 5,000,000 in service

THE RECOGNIZED STANDARD OF FLEXIBLE STAYS

Manufactured and Sold in Canada by

Canada Foundry Company, Limited

Head Office and Works, Toronto, Ont.

FLANNERY BOLT COMPANY

Vanadium Building **Pittsburgh, Pa.** **B. E. D. Stafford, Gen. Mgr.**

CRANES

"Industrial"

Wrecking, Locomotive and Coaling Cranes

In Capacities of from Five to One Hundred and Twenty Tons.
For use about

Railroads, Manufacturing Plants, Coaling Stations, Quarries.

Let us send you our Catalogue.

SOLE CANADIAN REPRESENTATIVES

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BRANCHES:
General Supply Co., Limited
Winnipeg, Man.
Ritchie Contractors' Supply Co., Vancouver, B.C.

Canadian Northern Ontario Railway

Toronto-Ottawa Line

In operation to Oshawa, Bowmanville, Orono, Port Hope, Cobourg, Trenton, Belleville and Napanee

with connection at Trenton for Picton and other C.O.R. Stations

Through fares include bus fare and hand baggage transfer to Oshawa Town and Bowmanville Town.

Trains run to and from Union Station, Toronto, Union Station with Central Ontario Railway, Trenton, located in the centre of the Town.

Solid Wide Vestibuled Trains.
Parlor Car and Dining Car Service.

Toronto, Parry Sound, Sudbury and Ruel Line

Through Service to Sudbury, Sellwood and Ruel.
Daily, Sunday excepted.

Ruel is the Gateway to the Mining Camps at Shining Tree, Gowganda and other new Camps where large operations are under way.

There are many business opportunities along this line.

Write for new folder showing time tables of Canadian Northern Eastern and Western Lines, with maps and full information about the Canadian Northern System, Railways, Steamships, Hotels, Express and Telegraph Service.

R. L. FAIRBAIRN, General Passenger Agent.

CANADIAN NORTHERN STEAMSHIPS, Limited

THE ROYAL LINE

MONTREAL QUEBEC BRISTOL

ROYAL GEORGE AND ROYAL EDWARD

Their equipment and interior appointments are of the most luxurious and modern description, and all the conveniences and comforts that make for an enjoyable voyage have been thoroughly anticipated. Marconi wireless, deep sea telephones, passenger elevators, thermo-tank system of ventilation, superbly appointed cabins.

For full particulars apply to the nearest Railway or Steamship Agent.

P. MOONEY, Genl. Agent, Halifax, N.S.; J. B. HOSEASON, Genl. Agent, Montreal, Que.; H. C. BOURLIER, Genl. Agent, Toronto, Ont.; A. H. DAVIS, Genl. Agent, Winnipeg, Man.

GEO. H. SHAW, General Traffic Manager, Toronto, Ont.

Wire Rope

We manufacture and carry in stock all sizes and lengths of wire rope. Wire Rope suitable for Hoisting, Haulage, Guys, Towing, Dredges, Transmission of Power, Grain Shovels, Switch Ropes, Derricks, Wrecking Cranes, Elevators, Bridges, Ballast Unloaders, Etc.

We manufacture special ropes to suit any requirements.

We carry in stock Blocks, Clips, Thimbles, Hooks, Turnbuckles, Shackles, Etc.

OUR NEW CATALOGUE

Our new Catalogue, which illustrates and lists all kinds of wire rope is now ready for distribution. We will gladly mail copy upon request to any interested party. Drop us a line at once as this catalogue will prove useful.

THE DOMINION WIRE ROPE CO., LIMITED, Montreal.

NOVA SCOTIA STEEL AND COAL CO. LIMITED

MANUFACTURERS OF

Railway and Electric Car Axles, Angle Bar, and Tie Plates, Railway Spikes

Tee Rails 12, 18, and 28 lb. per yard

ALL SIZES BAR STEEL FOR CAR-BUILDERS' USE. Spring, Machinery, Tire, Angles, and Merchant Bar Steel. Heavy Forgings of all Descriptions.

SCOTIA PIG IRON Also Miners and Shippers of the Famous Old Mines "SYDNEY" **COAL**

High in Carbon—Low in Ash. The best Steam Coal for Locomotive, Steamship, and Stationary Boilers.

Works at NEW GLASGOW AND SYDNEY MINES, NOVA SCOTIA

Collieries at SYDNEY MINES

FOR PRICES AND OTHER PARTICULARS APPLY TO

Head Office: NEW GLASGOW, N.S.

WHAT

Northern-Electric

SERVICE MEANS TO THE RAILROADS

TELEPHONE EQUIPMENT of established and reliable quality. Northern Electric high efficiency transmission circuit is the only "answer" for railroad telephone lines.

SELECTOR EQUIPMENT that is simple and dependable—entire satisfaction wherever installed.

LINE MATERIAL, TOOLS AND SUPPLIES furnished by the Northern Electric Company—the best of their kind.

COMPLETE STOCK at our various distributing houses at our customers' disposal. May they never need an emergency shipment; when they do, they will find us ready.

PRICES as low as consistent with high quality. The price is forgotten, but the quality remains as a tribute to our mutual good judgment.

ENGINEERING SERVICES at the railroads' disposal.

Write now for Bulletin 3007.

THE Northern-Electric AND MANUFACTURING CO. LIMITED

Manufacturer and Distributor of Telephone Apparatus, Electrical Supplies, and Fire Alarm Apparatus for every possible need. Address our nearest house.

MONTREAL TORONTO WINNIPEG REGINA EDMONTON CALGARY VANCOUVER

$50,000 Lost Last Year

At the prices which have been paid for brake shoes by the Canadian Railroads, over three dollars a ton has been lost.

We know that the initial cost is not the only factor to be considered in accomplishing a saving, but taking this only into consideration, every thousand tons purchased represents a loss of over $3,000.

It is true that the first great saving was made when steel reinforced brake shoes were adopted, but we come to you now with an additional saving far more important than the first.

We not only give improved service; our double steel reinforced brake shoe wears to extreme thinness, grips the wheel firmly, is extra strong and therefore safe, and gives minimum scrap, each of which features is a saving in itself. But we go still further—the price at which we can make this improved and perfected brake shoe entirely wipes out the heavy loss shown above.

A brief investigation now will uncover the trouble. May we co-operate with you in setting it right?

If you have not used our shoe yet, drop us a line and we will send you enough to equip one coach free of charge.

The Double Steel Reinforced Brake Shoe

Made only by

Canadian Brake Shoes Limited

334 St. James St., Montreal, Que.

Bare and Insulated

WIRE AND CABLE

IN

Copper and Aluminum

Copper Clad (Duplex Metal) Wire

Galvanized Steel Strand for Guys

Canada Wire and Cable Company, Limited

1170 Dundas St., Toronto

Stock of Wire and Cable carried in Toronto, Montreal and Winnipeg.

Sales Agents { Roper, Clarke & Co., Ltd., Montreal.
A. E. Esling, Scott Block, Winnipeg.
Macdonald, Marpole Co., Ltd., Vancouver.

MODERN HIGH-CLASS

ROLLING STOCK

PASSENGER FREIGHT AND ELECTRIC RAILWAY
RUGGLES' ROTARY SNOW PLOWS
CAR CASTINGS, FORGINGS AND REPAIR PARTS

CROSSEN CAR COMPANY, LTD.

COBOURG - ONTARIO

Why the C. P. R. North Toronto Route to Ottawa and Montreal is the Logical One

The train leaves as follows:

Leave North Parkdale - - -	9.15 p.m.	Arrive Ottawa,	6.50 a.m.
Leave West Toronto - - -	9.30 p.m.	Arrive Montreal,	7.00 a.m.
Arrive North Toronto - - -	9.40 p.m.	Daily.	
Leave North Toronto - - -	10.00 p.m.	Will Stop at Westmount.	

Electric Lighted Compartment Cars and Standard Sleepers for both points.

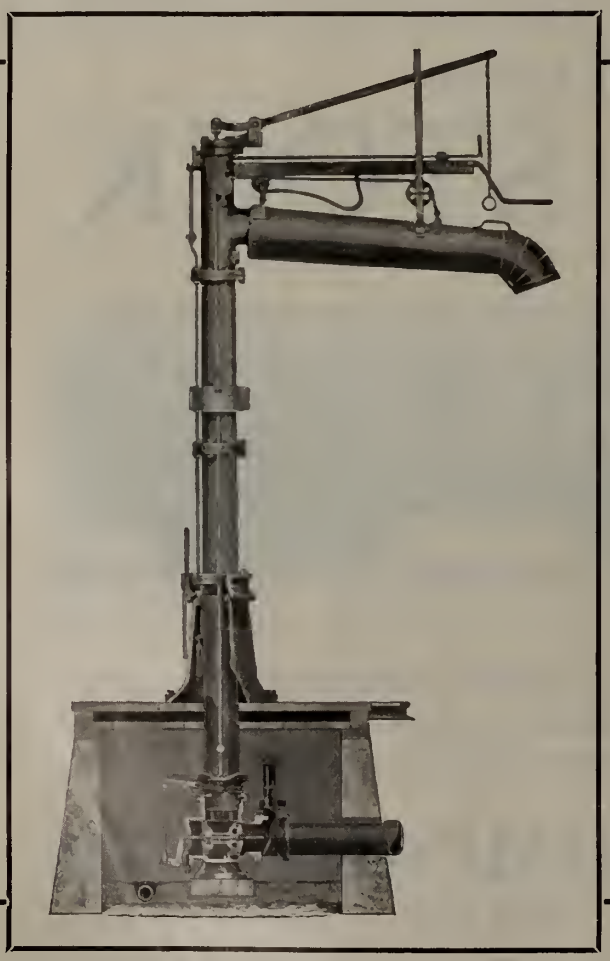
¶ The North Toronto route is over an hour faster and overcomes a long hill climb for the train out of Toronto, obviating any inconvenience and ensuring early arrival at Montreal and Ottawa.

¶ The roadbed has been improved till it is unexcelled in Canada.

¶ The equipment is "Canadian Pacific Standard," a synonym for the "best" and attentive porters, ensure efficient service.

For Sleeping Car Space, Tickets, etc., Apply—

Toronto City Office: 16 King St. East, North Toronto Station, King Edward Hotel, West Toronto Station, or write M. G. Murphy, Dist. Passr. Agent, Toronto.



McAvity Improved Standpipe

Type G.

The McAvity Type G Standpipe, by its greater range of drop pipe, meets all requirements where different heights of tenders are in service. It is a combination of the Standard Sheffield Valve with carefully designed upper works. The telescopic delivery spout excels all other such arrangements in strength, simplicity and convenience in operating.

As there is no internal mechanism whatever in the McAvity Type G Standard, it is adapted for use in the coldest climate. Locks automatically and positively parallel with track when not in use.

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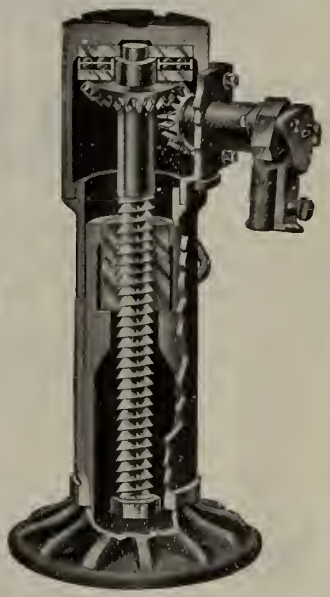

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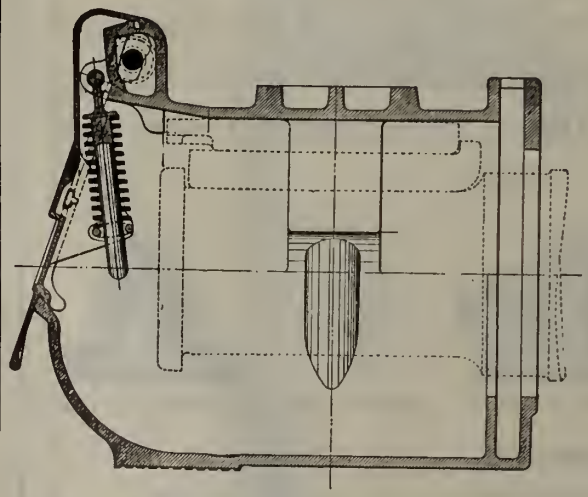

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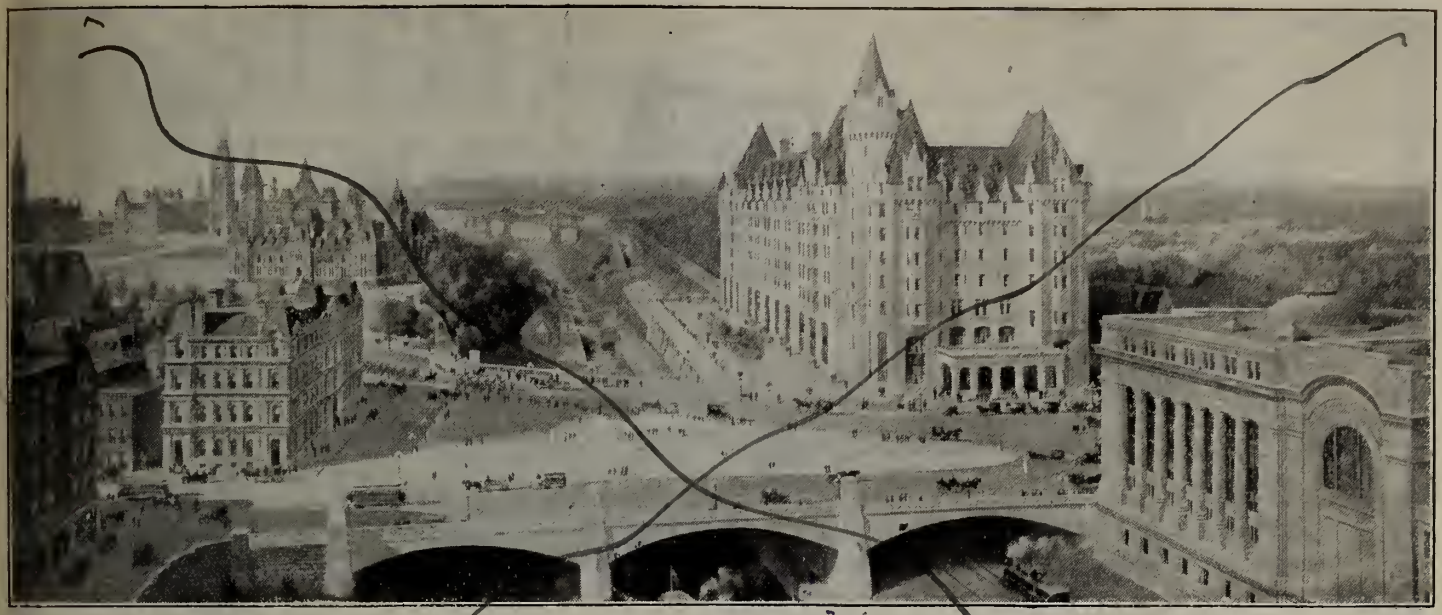

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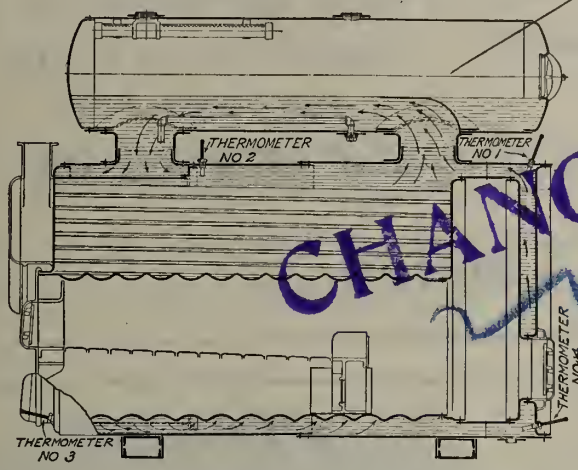

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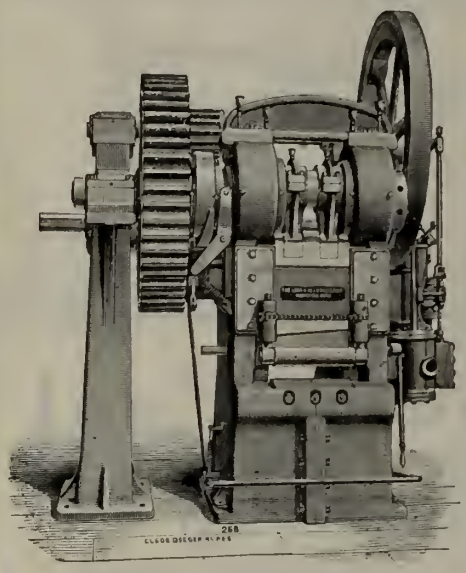

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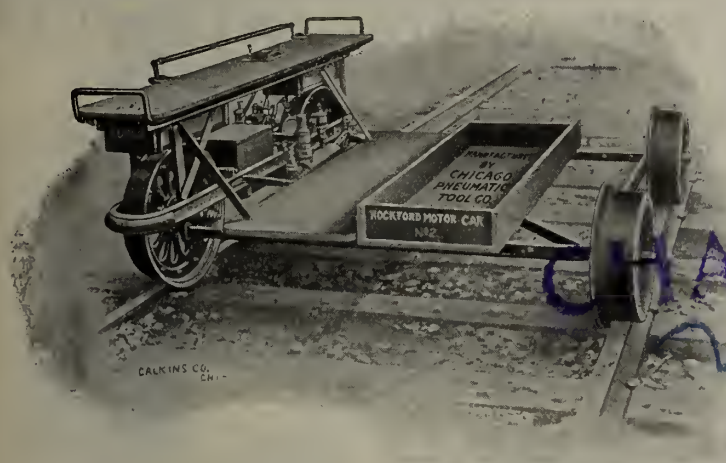

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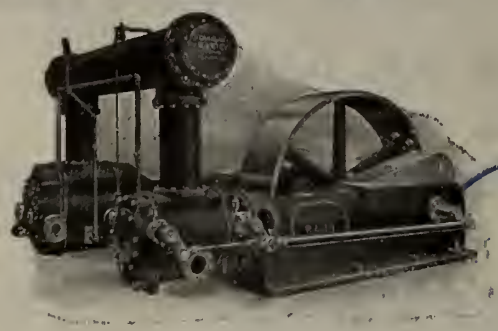

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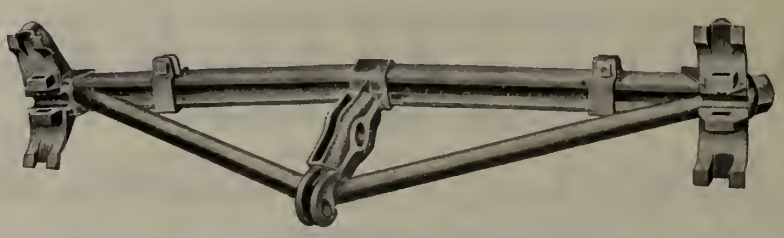

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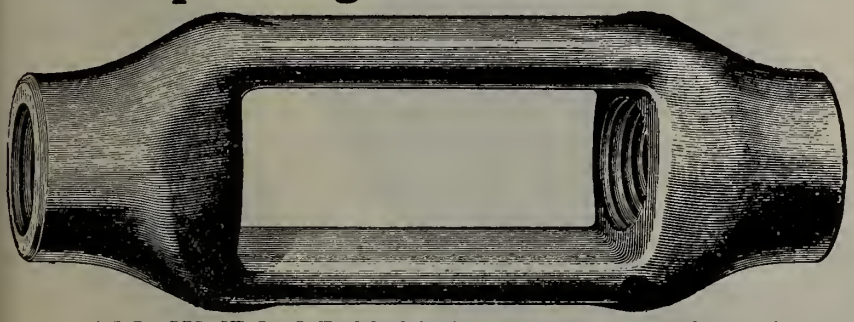

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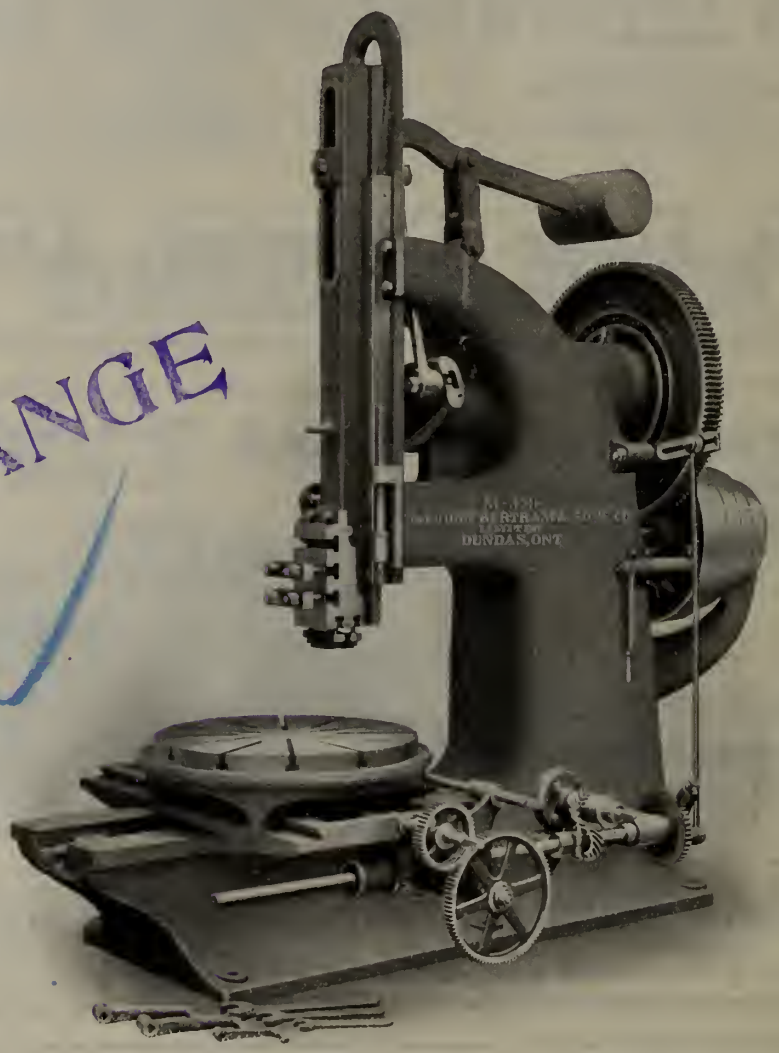

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Canadian Railway and Marine World.

September, 1912.

The Grand Trunk Railway's Practice in Machining the Stephenson Link Motion.

By Frederick H. Moody, B. A. Sc.

At the G.T.R. Point St. Charles shops, Montreal, the process of machining a complete link motion has been developed to a nice degree, many simple labor-saving jigs which not only facilitate but improve the quality of the work, have been introduced, so that today the process is rather unique in its simplicity and thoroughness. The process outlined in this article has been developed step by step by the machine shop foreman, through whose assistance the following information has been obtained.

The Stephenson link motion is rapidly falling into disfavor as compared to the simpler Walschaert gear, but its use is still sufficiently great in new equipment to warrant a description of the process of manufacture, more for the value of the methods and processes used than from the fact that it is to be extensively used in the future. So long as existing locomotives equipped with the Stephenson motion require repair and renewal of parts, just so long will it be a matter of interest to those responsible for its production in the shop.

The motion selected as an example of the method of procedure, is that which is standard for Pacific type locomotives of classes ACEFP, the commonest example of this lot being that series of locomotives commonly called the 900 class. Such a motion is shown assembled in fig. 1. It will be noticed that it has been the aim throughout to keep the parts standard as far as possible, so that the factor of fitting new parts in the event of renewal is reduced to a minimum. This is emphasized by the fact that the one gear is applicable over such a range of types. It has been with this standardizing object in view that the ways and means outlined in this article have been devised.

THE ECCENTRIC SHEAVE shown partially finished in fig. 2, is made of cast iron in two sections divided in a plane through the centre of the driving axle on which the sheave is to be mounted. The first machining operation is that of planing both sides in a shaper, each section being machined independently to the same thickness. Following this, the mating face of the small section of the sheave is tongued to fit a corresponding groove of the mating surface of the larger section. The two sections are next drilled perpendicularly to the contact faces on each side of the driving axle opening. This is performed in simple jigs. The holes in the smaller section are tapped to receive studs which pass through clearance holes in the larger section, clamping nuts in the cored cavity of this section holding the two parts together.

After clamping together, the next operation is that of boring the driving axle opening by chucking in a lathe, centralizing and boring in a manner familiar to all. Following this comes the operation of slotting a keyway centrally in the bore of the large section. The next operation is rather interesting, being that of turning the outside for the strap fit, and giving the correct amount of throw. This is performed in the manner illustrated in fig. 2. A cast iron block of the driving shaft or axle diameter, is bolted to a small faceplate in an engine lathe, this block being adjusted in location to give the required throw. A keyway in this block is set in a line through the two centres of the lathe and block, so as to correctly engage the keyway of the sheave. The jig block thus mounted and adjusted is ready to receive the sheave, which after being keyed, is clamped to the lathe faceplate for turning to gauge or to an old strap. The value of such a rig lies not so much in its ability to produce a single sheave more rapidly, but rather from the fact that where the sheaves are produced in sets of several at a time, no time is lost in setting up, all that is necessary being to slide the sheave on to the jig block, key and clamp.

The only remaining operation on the sheave is that of drilling two holes for the pinch or set screws which keep the sheave from travelling along the shaft. For this operation, one surface of the sheave is scribed in chalk as shown, in a line through the bosses in the cored cavity of the larger section; and when the sections are parted, by setting up in the drill press to this scribed line, the two holes are drilled and tapped for the set screws to be entered from the cored cavity end.

THE ECCENTRIC STRAP shown in the assembled view, is made in two sections, parted through the centre in the usual manner, and held together by bolts through the projecting flanges. The eccentric rod is attached from a projecting lug of one of the sections.

The first operation is that of milling the engaging surfaces to fit together. Following this comes the operation of drilling the clamping holes, and babbitt and oil holes in the inner face. The method of doing this alone, with jig and tool used, was described in Canadian Railway and Marine World for February last. Briefly, the method is as follows: On the vertical face of a radial drill table, a jig, carrying a plate free to revolve, is mounted. On this plate, contact faces uppermost, a half section of the strap is clamped, the revolving disc being so mounted for the first operation as to have the contact faces level. A drilling gauge, consisting of a steel plate formed to the inner contour of the sheave, with ends projecting over on to the bolting flanges of the sheave, is dropped into position. In the level position, the bolt holes are drilled through

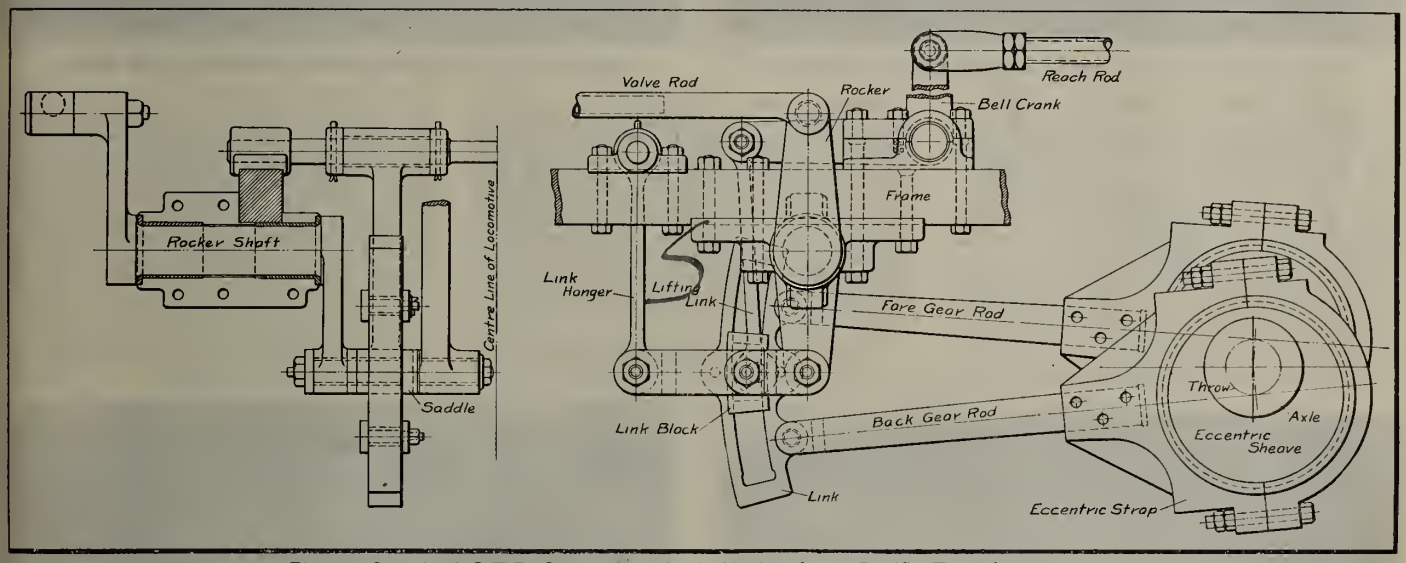


Fig. 1. Standard G.T.R. Stephenson Link Motion for a Pacific Type Locomotive.

drill bushings held in the jig plate. Subsequent to this, the carrying plate is swung around an amount sufficient to bring the jig holes for drilling the babbitt recesses into a level position, this position being obtained by placing a level on the drill bushing in each position as it is required to be levelled up. In this position the revolving plate is clamped, and a shallow hole drilled, this being followed by a recessing tool so designed as to have the cutting edges spread at the ends after entering the hole, recessing the hole to form a retaining collar all around for the babbitt later poured into these spots. Both halves of the strap shape shown, has a pin projecting inward from the downwardly projecting end. This pin, rounded on its inner end, forms a stop against which the jig block is drawn. In this position the holes are drilled, the holes being exactly located with regard to the finished interior of the strap. With the jig used in this manner, the time of laying out the holes is saved, and at the same time, the holes are drilled absolutely accurately.

THE ECCENTRIC ROD is a wrought iron forging, with the forked end solid. The first operation consists of milling the surfaces all over, on the completion of which the pin hole through the jaw end of the block B, (the same block as that shown at A in fig. 3). These plates project down from the sides and end of the butt, thereby locating it centrally and true with the locating end. Clamped in that position the bolt holes are drilled. As in its former use, it is reversible for drilling either right or left hand butt ends by merely turning over, the side and end plates projecting above and below the surfaces of the gauge.

THE RADIUS LINK as it reaches the machine shop, is a solid forging roughly shaped to size. In the first place, it is surfaced off on both faces on the planer

Fig. 2. Turning an Eccentric Sheave on Special Mandrels.

Fig. 3. Jig for Drilling Holes for Eccentric Rod Butt.

are drilled with the same jig and tool. Following this, the cupped holes are poured with babbitt. These babbitt spots are shown in fig. 3.

Next in order comes the bolting together of the sections prior to the boring; this is the operation immediately following, and is performed in a usual manner by chucking in a lathe.

Machining the recess for the eccentric rod butt follows. The cast opening in the projecting butt lug, is relieved at the inner end by a cast channel so that the cutting tool relieves itself at the end of the cut and is not forced up against a is drilled with a centralizing jig. With this drilled hole as a central guide, the jaw is milled around the circular end by mounting on a milling table, with the rod so clamped to a stud screwed into the centre of the table, as to have the hole directly over the centre of rotation. Following this, the sides of the butt end are milled to gauge and likewise the end, milling the latter to a gauge which determines the length from the centre of the jaw pin hole, so that all rods are equal in length.

A hole is next drilled in the jaw end to form the relief for a slotting tool to the required thickness, and then passed on to the drill press, where holes for the eccentric rod pins and saddle bolts are drilled to gauge, and at the same time rough holes are drilled at the end of the radius slot of the link. The clearance holes at the end of the slot are next scribed on the surface, position being taken from the eccentric rod holes, following which the slotter removes the clearance metal.

The next operation consists in milling all the edges, both inside and outside, on a vertical miller, by the use of the attachment shown in fig. 5. They are

Fig. 4. Jig for Drilling Holes in Eccentric Rod Butt.

Fig. 5. Vertical Miller Attachment for Milling Radius Link.

shoulder. This machining is performed in a planer or shaper.

Drilling the bolt holes for attaching the eccentric rod butt is accomplished in the manner indicated in fig. 3, a rather novel jig being used for the purpose. A block of steel, A, containing bushed drill holes of the correct size and in the proper location, fits snugly into the machined recess for the eccentric rod butt. The jig is reversible, for the bushes are chamfered for the entry of the drill from either side. Through this block, there are two ½ in. holes, into which pins projecting from the lower surface of the block B fit snugly. The arm, C, of this block, formed to the which removes the block of wrought iron between the forked jaws in a slotter, finishing the inner faces to gauge. This completes the rod, with the exception of drilling the bolt holes in the butt ends as shown in fig. 4. The extreme end of the butt having been previously machined to a given length, as mentioned earlier, this end may be used as the determining point to which a drilling gauge may be set for this operation.

Reference to fig. 4, will show that the drill jig is the same one as that used for drilling the eccentric strap butt, so that the bolt holes are certain to match up correctly. Thin plates, A, as shown, are attached to the sides and one to the end machined in pairs. The construction of the attachment is very simple. On the end of the platen guides, there is attached an extension bracket A, centrally located and in line with the platen guides. On the bed, B, of this bracket, there is a plate, C, the upper surface of which has guiding ways for the carriage, D, adjustable lengthwise by means of the screw attached to the end of rod E with a handle at the outer end of the attachment. The carriage D, has a pin projecting from its upper surface carrying the clamp block F. This clamp block secures a slotted rod, G, which is rigidly attached at its inner end to the miller platen. In operation, the outward and

circular feeds of the miller are disengaged, and only the cross feed employed, the whole platen swinging on the centre pin of the attachment, the platen carriage adjusting itself thereto. Adjustment for locating the milling cutter for the successive cuts on the different edges, is made through the screw on the end of the rod E. The inside edges of the link are open to machining by milling, from the fact that the clearance holes at the end have been previously drilled and slotted. The correct radius is set from the pin on the carriage of the attachment. Following this the oil holes are drilled.

Fig. 6. Grinding to Radius the Inner Surfaces of the Link.

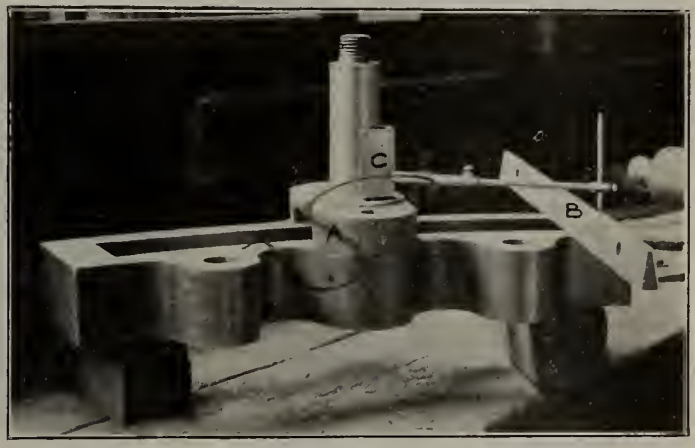


Fig. 7. Testing the Saddle Base on the Link Surface.

The next step is to file the link all over, preparatory to the case-hardening process to which it is subjected on the completion of the filing. The case-hardening tends to warp the link, requiring a subsequent straightening under a press. This is followed by a grinding of both surfaces on a surface grinder. The holes for the eccentric rod pins are then lapped out, and case-hardened and ground bushings forced into them.

The final operation on the link is that of grinding the inner surfaces to a correct radius. A specially designed machine, the construction of which is shown in fig. 6, in conjunction with a standard grinder which is likewise shown, performs this operation. On a plate, A, the link to be ground is mounted. This carrying plate, A, is pinned at B to a long slotted arm, C, an arm of the plate A passing back a couple of feet alongside. A stand, D, carries on its upper surface a carriage, E, adjustable along the top in guided ways. Through the centre of the carriage E, there is a pin on which plates F, for clamping the slotted rod C are free to oscillate. The clamp plates, F, are secured to the slotted rod in any position of the carriage E, by the handwheel in front of the carriage. The slotted rod is oscillated by a connecting rod of variable length from the power driven wheel, G, on which any throw of the crankpin may be obtained. The oscillating arm is guided in its movements by the supports, H, between which the arm moves vertically. In the foreground stands the standard grinder, driven from above. The feed, however, is derived from the oscillating arm drive through the train of gears, I, making the speed and feed interdependent.

The oscillating arm and supporting carriage are first set to give the correct radius. The link is then approximately attached as previously mentioned, when, by trial, it will be found that while the radii of the link and machine are the same (from the original setting), the centre for the link arc will probably be slightly above or below that of the oscillating arm. To remedy this, it is not necessary to loosen the link from its supporting plate. As previously mentioned, this plate A, pinned at B, projects back alongside of the arm C, (on the other side of the arm, so not visible). Set-screws, J, through bosses on the rear side of this arm, bear on the end of the plate A, adjustment for coincidence being there attended to.

THE SADDLE is made from a solid forging, and after reaching the machine shop, is turned and milled all over to the form shown in figs. 7 and 8, where it is mounted on the link. In view of the fact that a great deal of wear comes on the pin, that part of the saddle is case-hardened and ground. Following this case-hardening of the pin end, the base is refaced in the lathe.

The next step is that of determining the alignment of the saddle with regard to the ground surface of the radius link to which it is attached. The method of doing this is shown in fig. 7. A saddle, A, is mounted into approximate position on the link. Near one end of the link, a triangular straight-edge, B, made this shape so that it will sit without support, is placed. A form of surface gauge, C, adjustable in two directions, is held against the pin of the saddle on its V shaped base. Each edge of the V shaped base has a small projecting pin, forming the gauge support on the shoulder of the saddle. The arms of the surface gauge are adjusted so that the point just scrapes the top of the straight edge when pressed against the saddle pin and resting on the saddle shoulder. The gauge is swung out in turn to each end of the straight-edge, any error being noted. The straight-edge is then moved across to the other end of the link and this same process repeated. Any variation in height at these four tested points is compensated for by scraping the base of the saddle on the side or corner that will give the required correction.

Locating the saddle is the next operation to require attention, and the method of so doing is shown in fig. 8. This saddle must not only be located midway between the eccentric rod pin holes, it must also have the exact offset over the slot of the radius link. The saddle is first located as close to its correct position as it is possible to do so by eye. The next step is to locate the saddle over the link slot to give the correct offset; this is done by the use of the plate gauge shown standing up against the saddle pin at A. The distance from the right hand edge of this gauge to the centre point of the upper end, is made exactly to suit the offset required. Putting this centering gauge under the saddle against a wall of the slot, and bringing the lathe centre hole of the saddle to fit over the gauge point, places the saddle in its proper location.

This having been accomplished, the centralizing of the link with regard to the eccentric rod pin holes follows. Two pins, B, fit into segmental bushings in the eccentric rod pin holes. These segmental bushings to hold the pins, are made in

Fig. 8. Locating the Saddle Correctly on the Link.

Fig. 9. Machine for Finishing the Tumbling Shaft Arms.

three sections, in pairs, a wide range of these pairs being at hand for use with different sizes of pin holes. The set standing on the left end of the link is for use with larger holes. The lower ends of the gauging pins are tapered, with a corresponding taper in the bore of the segmental sections. The gauging pins are thus made solid, and perfectly central and in line with the eccentric rod hole. A gauge, C, corresponding in construction to a height gauge, placed between the saddle pin and gauging pins in turn, locates the saddle in its central position. When thus located correctly, with regard to the two determining factors, the link and saddle are clamped together and the two bolt holes in the saddle drilled through the previously drilled holes in the link.

LINK BLOCK.—From the fact that the link block is such a small member, it is made in sets of four from a forged wrought iron block. This wrought iron block is first planed on its flat surfaces, and then drilled to gauge with four holes for the rocker shaft connection. Following this, the block of four is milled to the required radius on the rig shown in fig. 5, previously described. The drilled holes are the determining points from which to set the block up in the machine. The four pieces are then cut from the block. Both planed sides are then faced off in the lathe, concentric with the drilled holes, to form bosses on each side, over which the retaining collars fit. After drilling the rivet and oil holes, each block is case-hardened, followed by lapping out the central hole and a grinding of the arc surface of the blocks in the radius grinding machine. This completes the link block up to the stage of assembling.

THE LINK BLOCK PLATES are made from thin forged blocks, faced on a milling machine and bored in a lathe one at a time. The large edge radius is given the plates by mounting them 12 at a time in a miller and running over the edges with a formed cutter of the correct shape. After drilling the rivet holes, they are case-hardened, followed by a surface grinding which leaves them ready for rivetting to the link block, four rivets being required.

THE LIFTING LINKS are also wrought iron forgings. The first machining is that of facing the four faces on the miller to give the necessary surfaces from which to work. Both ends are then drilled to jig for the insertion of bushings. Following this, the link is milled all over, including the round ends and flat sides, completing the machining by drilling the oil holes. Hardened steel bushings are then ground and pressed into the drilled ends, this operation being followed by a facing off of the first-milled surfaces by a cutter on a mandrel working in the hardened bushings.

THE TUMBLING SHAFT is a built up forging. The first operation is that of turning the body for the end journals, these turned ends acting as guiding points from which the balance of the machining is done. Slotting the faces of the bosses follows, gauging from the finished surfaces of the journals.

Next in order comes the boring and reaming of the two lifting link arms, the reach rod arm and the spring arm in the machine shown in fig. 9. The shaft is held between centres, A, mounted on the stands B, across which the centres are adjustable. The stands, B, are attached to a surface plate base, C, and may also be adjusted to suit the size of the piece being machined. The arms to be bored and reamed are centred by set screws top and bottom in the steadying castings, D, bolted to the base C. The first operation after correctly aligning horizontally and vertically, is that of drilling the bosses. A drill rod held in the chuck E, is guided in a bushing in the support F, against the first boss. Stand G guides the drill rod for the second boss. There is also a third support at H.

The second or reaming operation, is performed by the reamer rod I, held in the chuck E, and guided into the drilled holes by the supports. The outside of the boss ends are turned by the use of a cutter head, J, mounted on a gulding bar. Following this, the previously slotted boss faces are faced off by a facing cutter through the cutter bar as at K. The reach rod and spring arm bosses are machined in a similar manner.

After removing from the special machine, the metal on the boss opposite the arm, which could not be removed by the cutter head, is slotted off by standing the bosses on end over centres in the slotter. Ground bushings are then forced in to the holes in the reach rod and spring arms. Likewise, the lifting link pins are ground into their arms and there set, completing the machining of

Canadian Northern Railway Ten Wheel Superheater Locomotives.

Within the past few months the Canadian Northern Ry. has received 20 ten wheel locomotives from the Montreal Locomotive Works. Though of moderate weight, these locomotives are of more than ordinary interest, because of the number of features presented in the design which are said to be new on Canadian railways and which are quite a radical departure from present practice.

Among these will be noticed the arrangement of steam pipes connected to the cylinders outside of the smoke box; the so-called self centering guide for the valve stem crosshead and the guide for the extended piston rods. All of these have been quite widely adopted on United States lines. These same details were applied to 20 heavier 10 wheel locomotives constructed by the same builders for the C.N.R. in 1911.

One of the accompanying illustrations shows an arrangement of the outside steam pipes similar to the one here employed. An air tight joint is provided where the steam pipes are carried out through the smoke box. This arrangement removes much of the obstruction to draught in the smoke box which is present with steam pipes of the ordinary construction. It also eliminates the live steam passages in the cylinder saddle, thereby greatly simplifying the coring of the cylinder. This also reduces any tendency of cylinders cracking in service, due to the difference in temperature between the live steam and the exhaust steam passages which exists in the ordinary cylinder construction where the two passages are side by side. This is of special importance where highly superheated steam is used. A much better joint to the cylinders is also obtained; as eight bolts of equal length with a symmetrical circular flange are used in place of four or six bolts, as in the case of the bent inside steam pipe. Should a small leak occur, this arrangement also prevents any injurious effect on the steaming of the engine. A leak would merely waste steam, but would not interfere with the vacuum in the smoke box, as it does in the case of ordinary inside steam pipe construction.

One of the principal advantages of the design of valve stem guide lies in the fact that it can be erected, taken down and replaced without lining up, at the same time insuring that the guide is absolutely in line with the centre of the piston valve chamber. This device consists of a guide made integral with the back head of the valve chamber. It is consequently self-centering and is also self-supporting, no bracing from the crosshead guides or any other source than the cylinder being required. The guide is so designed as to be easily adjustable for wear. Liners are provided on the top and bottom, which in case of wear, may be removed or inserted as may be required. This arrangement makes it possible to use a straight design of combination lever without forks which is connected to the crosshead by a pin passing through the wings of the latter. This affords more lateral stability than is provided in other designs.

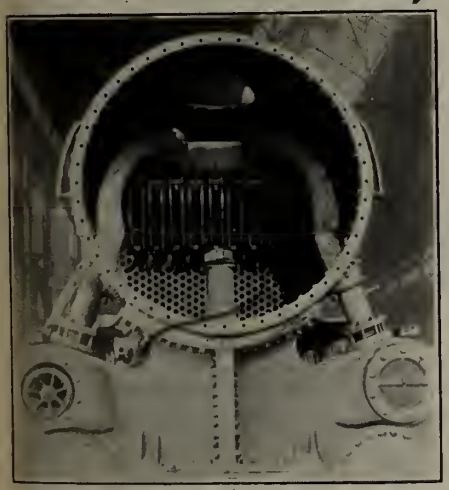
In the design of guide for the extension piston rod, the self centering principle is also employed. As a result, the guide can be removed and replaced without requiring lining, and at the same

Canadian Northern Railway Ten-Wheel Superheater Locomotive.

time its axis exactly coincides with the longitudinal axis of the cylinder. It also provides ample wearing surface to insure long service without requiring adjustments. The general construction of this device is shown in one of the accompanying illustrations. The guide is so constructed that it is bored out and faced off at one setting on the machine. Its circular face registers with a corresponding face on the front cylinder head and the surface of the guide is struck from the centre of the cylinder. The shoe fitted to the extension of the piston rod has a radial bearing on the guide. Consequently, any refinement in adjustment between the piston rod shoe and the main cross

C.N.R. Locomotive. Piston Crosshead Guide.

head is unnecessary because, while the latter works in a flat guide, the former will swing around on the centre of the cylinder so that it will always take a fair bearing without cramping. The guide casing is open at the top, with a corresponding opening in the flange; so that the guide can be easily removed, if the engine is on the forward centre, without taking down the pilot and bumper. It is provided with a dust tight top and cover and with oil stops; so that the shoe always runs in oil. Experience with this device, covering nearly two years on a large railway in the northwest of the



C.N.R. Locomotive. Arrangement of Outside Steam Pipes.

United States, indicates that the wear on the shoe and guides in two or three years will not exceed 1-16 in. This obviates the necessity of relining between general shoppings. In view of the general use of extended piston rods on superheater locomotives, this device represents an important improvement in locomotive construction.

In the boiler construction, the principal features of interest are the superheater and the brick arch. The superheater is the Locomotive Superheater Co.'s type A. design. This arrangement employs a top-header and superheater pipes of the double loop construction. It is arranged to give a high degree of superheat and provides a superheating surface of 279.6 sq. ft. Because of the use of superheated steam, a low boiler pressure of 170 lbs. is employed. The boiler, however, is designed to stand a pressure of 200 lbs. The brick arch is supported on studs.

Following are the principal dimensions of the locomotives:—

Fuel	Soft coal
Weight on drivers in running order	112,500 lbs.
Weight on truck in running order	41,500 lbs.
Weight, total of engine in running order	154,000 lbs.
Weight of tender in running order	123,400 lbs.
Wheel base, driving	13 ft. 6 ins.
Wheel base, total engine	23 ft. 10 ins.
Wheel base, total engine and tender	52 ft. 8 ins.
Tractive power, maximum	243,000 lbs.
Adhesion (factor of)	4.63
Cylinders, diameter and stroke	20 in. by 24 in.
Valves, type of gear	Walschaert
Valves, diameter	12 in.
Greatest travel	5½ in.
Lead in full gear	3-16 in. lead constant
Driving wheels, diameter outside tire	57 in.
Driving journals, diar. and length.	8½ in. by 10 in.
Main crank pin journals, diar. length, 6 in. by 6 ins.	
Side rod crank pin journals, diar and length	6¾ in. by 5 in.
F. H. B. journals	4½ in. by 3⅝ in.
Engine truck, type	4 wheel with swing bolster
Engine truck journals, diar. and length	5½ by 10 ins.
Engine truck wheels, diar.	30 ins.
Boiler, style	Extended wagon top, radial stay
Boiler, outside diar. front end	58¼ in.
Boiler, outside diar. largest course	65 in.
Boiler, height over crown, front	21½ in.
Working pressure	170 lbs.
Firebox, length	102⅛ in.
Firebox, width	41¼ in.
Firebox depth	Front, 71½ in. back 58½ in.
Firebox, depth (top of grate to cen. lowest tube)	28-15-16 in.
Tubes, material	Kewa seamless steel
Tubes, thickness	no. 11 B.W.G.
Tubes, number of	133
Tubes, diameter	2 in.
Tubes, length	13 ft. 2¼ in.
Flues, material	Kewa seamless steel
Flues, number of	18
Flues, diameter of	5⅜ in.
Flues, spacing of	6¼ in. and 6⅝ in.
Heating surface, tubes,	1,241 sq. ft.
Heating surface, firebox	141 sq. ft.
Heating surface, total	1382 sq. ft.
Superheating surface (on basis of inside diar of superheater pipes)	279.6 sq. ft.
Grate area	29.2 sq. ft.
Exhaust pipes	Ry. Co.'s standard with single nozzle
Exhaust nozzle	4¾ in.; 5 in. and 5¼ in.
Smoke stack, diameter inside	16 in.
Tender wheels, number of	8
Tender wheels, diameter	33 in.
Tender journals, diar. and length	5½ in. by 10 in.
Tender wheel base	17 ft. 10 in.
Tender frame	13 in. cen. and 10 in. outside channels
Tender trucks, type	Ry. Co.'s 4-wheel pedestal type
Tank, kind	water bottom
Tank capacity	5,000 imp. gals.
Tank, coal capacity	10 tons

G. G. Hare, Assistant Engineer, Dominion Atlantic Ry., Kentville, N.S., writes:—"I enclose renewal order for my subscription to Canadian and Marine World. Please forward me the July and August numbers, which I have not received, owing to my removal here from Kingston, Ont., so that my file of your valuable publication may be complete."

Removing and Repacing a Wrecked Timber Truss Span on the C.N.R.

The clearing of a wrecked timber truss span and erection of a temporary structure, restoring traffic, was accomplished in three days on the Canadian Northern Ry. at Saskatoon, Sask., where a derailed car demolished the north shore span of the bridge over the South Saskatchewan River. This bridge consists of six 150 ft. through Howe truss spans of timber on concrete piers, the rail elevation being about 45 ft. above the surface of the water. The bridge was of Pacific Coast fir in first class condition. It was built about six years ago.

As one of the southbound through passenger trains, carrying several sleeping cars on its rear end, was pulling through the south end of the yard at the approach to the bridge on March 4, the rear truck of the last sleeper left the rails at a switch about 500 ft. north of the bridge. The truck slewed and led off on the switch to the west or right hand side until the wheels that should have been on the left hand rail were over a foot outside the right hand rail and beyond the guard timber. There was a 30 ft. approach trestle, but the wheels were hanging over the ends of the ties when this was reached, so the guard rails could have no effect. The sleeper was dragged in this position on to the bridge, sideswiping the truss and breaking or knocking out the posts and diagonals. This span collapsed completely, falling with the last car to the river bed below, which was almost dry and frozen to the bottom. The damage to the bridge did not extend beyond the first pier and the car preceding the one which wrecked the truss remained on the structure, having its rear badly damaged, however. Fifteen passengers were in the rear sleeper, and 12 were injured, but none fatally. A fire started in the wreckage, but was quickly put out by the city forces.

The werckage of the truss and the car was cleared away with the aid of a Lidgerwood ballast unloader, which dragged it sideways off the bridge site. A track which runs west along the river bank at right angles to the bridge was utilized for this purpose, the Lidgerwood car being set at the point marked A on the photograph of the reconstruction.

The cable was then run down to the wreckage, dragging the tangled mass of rods and timber and the wrecked sleeper out of the way.

Reconstruction was started by first erecting a temporary trestle over which traffic could be opened. Bents were framed on the ice and raised by a wrecking crane working outward from the shore end, blocking being put under the bents. On account of the end of the second sleeper overhanging the adjacent span, it was necessary to build entirely from the shore, so that the crane could be used to lift the overhanging car. The last two bents next to the pier were framed at the side of the bridge, then lifted clear and swung into place. When all but one panel of the trestle was decked, the crane lifted the end of the hanging car and pushed it forward on the undamaged part of the bridge.

With traffic thus restored, work was continued on the erection of the permanent Howe truss span, utilizing the trestle for falsework. Additional posts were placed vertically on the end of each sill to carry the weight of the new span.

The nature of this accident was such that it was believed to be unpreventable by the guard rails, and it is also believed that a steel structure would have suffered similarly.

The clearing of wreckage and re-erection of the span was done under the direction of J. A. Crawford, Bridge and Building Master, C.N.R. at Saskatoon.

National Transcontinental Railway Terminal Facilities at Moncton, N.B.

The National Transcontinental Ry. has under construction the facilities for its eastern terminal at Moncton, N.B., where it connects with the Intercolonial Ry. for St. John N.B., and Halifax, N.S. The trackage at present contemplated amounts to 10.6 miles, with room for the laying of an almost equal number when the demand arises.

The extent of the terminal, with its various auxiliary buildings, may be judged from the accompanying plan of the yard layout. The yards, with approaches, are over a mile long, and are located one mile from the point where the line joins the I.R.C., or about 1¾ miles from Moncton station. It is but a short distance from the I.R.C. new shops. The yards are located on a slight grade of 0.2088 ft. per hundred, rising from east to west. The eastern, or Moncton, end is 79.10 ft. above mean high water mark, and the western end, 87.45 ft., meaning a total rise in the length of the yard of 8.35 ft.

The yards are all to be north of the through main line, as it is expected that the trackage that can be placed there will prove ample for some time. To the south, it will be noticed, there is a strip the length of the yard which it is intended at some future date to convert into storage tracks, with a possible diversion of the main line to the south of this larger yard. The present storage capacity amounts to 600 cars, and the newer yard addition will add room for 600 more.

The main line along the south side of the property is located 18 ft. centres from a parallel track, the western end of which is used for caboose storage. Parallel with this, there is another through running track connecting with the caboose track through cross overs at the eastern end of the caboose storage space. To the north of this, at a 14 ft. spacing, there are nine through storage tracks leading from a 1 in 6 ladder track from the second track at the west end, and into a similar ladder at the eastern end, except for the lower three, which converge before leading on to the ladder, made necessary by the curve of the main line at that end of the yard. The first track north of these storage tracks is an open running track, connecting with the main line at both ends through a separate track parallel to the end ladder tracks. At both ends, there is a short parallel track, the one at the eastern end being used for caboose storage for traffic made up to travel in the opposite direction to that for which the west end caboose track is placed.

The upper ten tracks, at a 20 ft. spacing, entered by a separate 1 in 6 ladder track from the west, are for repair and bad order cars, conveniently located to the shops. Parallel with the ladder, near the west end, there is a short track for the wrecking outfit, which is handy to the main line on to which it can be run without any intermediate interference from blocked tracks.

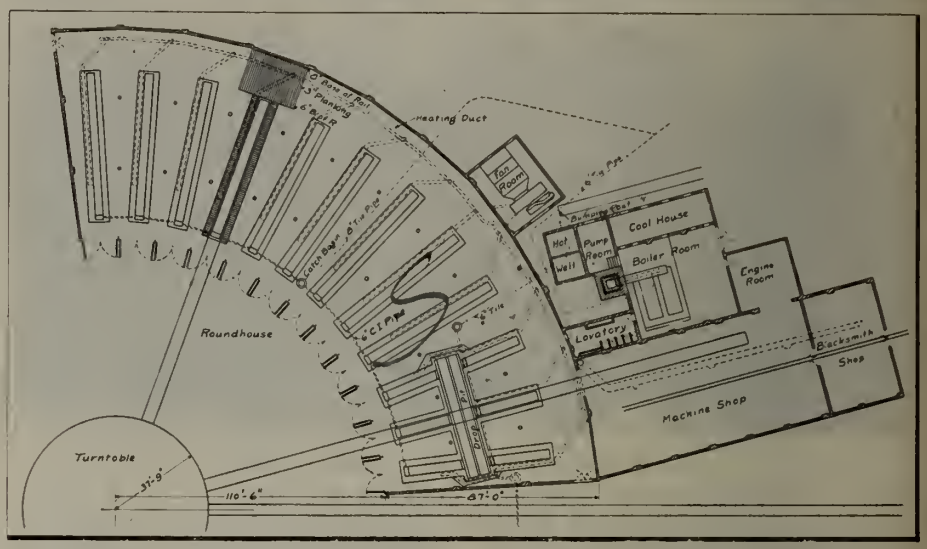
The roundhouse and machine shop, located at the end of the car repair tracks, is of standard type, being erected along both the N.T. Ry. and the Grand Trunk Pacific Ry., and is shown more in detail in the plan of the standard layout. The same roundhouse and shop are used at this point, the layout being reversed, which is the only difference. The one to be built here will have 12 stalls, but it will be noticed in the yard plan that space has been left for a future addition, for which the design of the shop layout is planned to accommodate. A 75½ ft. turntable serves the roundhouse, the inner posts of which are at a 110½ ft. radius. The roundhouse is 87 ft. deep. The upper nine of the stalls have no special fittings, but are constructed of concrete, the floor edge and the forward end planked. The three lower stalls have a drop pit connecting the three, with the centre track leading through into the machine shop to the rear. The machine shop in turn communicates with the blacksmith shop, which has an intervening wall, an optional construction being the elimination of this wall. An industrial railway connects the shops, leading out into the yard to the rear, where the bad order tracks are located. The engine room, boiler room, coal house, pump room and hot well adjoin this building. One of the bad order car tracks leads in alongside of the coal house for the coal supply. The fan room, along the outer wall of the roundhouse, supplies hot air through a concrete duct buried along the outer wall, smaller ducts leading therefrom along the walls of the pits, with entries at short intervals. The shops also have a buried system of conduits for heating.

Between the bad order tracks and the upper through running track, there are three leading from the west from the same ladder as the upper running track at a 19 ft. spacing. The middle one of these from the west leads on to the coaling trestle, from which the chutes are supplied. The two outer tracks are for coaling the tender. Further east on the same tracks are the ashpits, both tracks converging from that point on to the turntable. From the turntable east, there is only a single track leading parallel to the ladders to the main line.

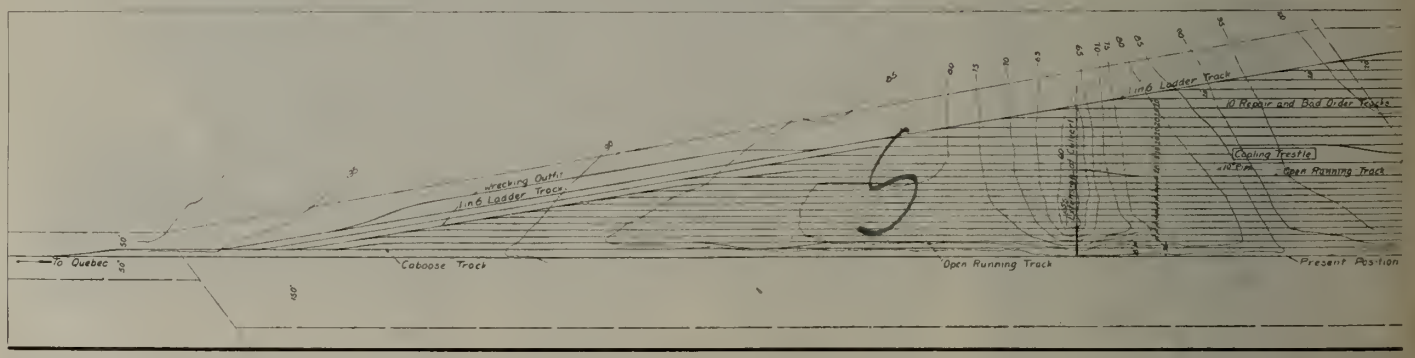
The engineering difficulties in the way of locating the yard were considerable, and careful planning was required. The yards could not be located in Moncton from a lack of suitable space. Likewise, it was impossible to place the yards very close to the city, from the fact that the track rises out of Moncton on a 0.6% grade, which is rather too great for an extensive yard. The nearest place where a nearly level yard could be built, was the present site, 1¾ miles from town.

The contour lines of the original ground formation are shown on the yard layout plan. Between the level at the location of the culvert under the tracks and that of the ground where the roundhouse is to stand, is a full 45 ft. At the east end, the final elevation is to 79.10 ft., necessitating the reduction of the 100 ft. level of the shop site and the filling in of the ravine, carrying the filling-in operation nearly to the western end of the yards, where the final level is to be 87.45 ft. The tracks on the western portion of the yard are all on made ground, but the shops are all on the higher levels that were reduced. Any settling of the fill will not affect the buildings. A very convenient arrangement of tracks and buildings has been obtained, considering the restrictions laid upon the engineers in the laying out of these yards.

All the work of filling has been com-



Standard Divisional Roundhouse and Shops for National Transcontinental Ry.



Yard Layout and Shop Arrangement for National

pleted, and track laying is in progress. The contract for the roundhouse has been let, and work is to commence in the near future. Tenders have been invited for the coaling trestle and the other buildings of the shop plan. The yard layout was designed at Ottawa, and the work carried out under the direction of the C. O. Foss, District Engineer, N.T.R., St. John, N.B.

Grand Trunk Terminals Warehouse Company Ltd.

Canadian Railway and Marine World for August contained some extracts from this company's prospectus, which contained the names of W. Wainwright, J. E. Dalrymple and R. S. Logan, three of the G.T.R. Vice Presidents, as directors. Just after the issue had gone to press, McCuaig Bros. and Co., of Montreal, who issued the prospectus, sent out the following notice:—

"Referring to the circular which we recently issued in connection with the bonds of the Grand Trunk Terminals Warehouse Co., Ltd., we beg to advise you that the composition of the board of directors as given therein is not as stated. While the G.T.R. reserved the privilege of appointing three out of the seven directors, they have so far not definitely decided whom they will appoint, although the directors as they appear in our circular were announced in the Montreal papers. Pending therefore a definite statement in this connection, we beg to advise you that we have withdrawn our circular in connection with the above company and would therefore ask you to cancel same."

It seems an extraordinary thing that a prospectus of a company should be prepared and names of directors inserted on the strength of a daily newspaper report.

Completion of the Atlantic, Quebec and Western Ry.

By the opening of the Atlantic Quebec and Western Ry. on August 1 to Gaspe Basin, the extreme eastern end of the Gaspe peninsula, in the Province of Quebec, has been given the railway communication which has been looked forward to for so many years.

Starting at Matapedia, Que., on the Intercolonial Ry., the Quebec Oriental Ry., formerly the old Baie de Chaleur Ry. and subsequently the Atlantic and Lake Superior Ry., runs to New Carlisle 98 miles, from which point the Atlantic Quebec and Western Ry. has been built to Gaspe Basin, 104 miles, a total of 202 miles. A through train is now being run each way daily, except Sunday, between Matapedia and Gaspe Basin, both lines being under the general managership of C. R. Scoles, who was the contractor for a considerable portion of the A.Q. and W. Ry., which is a well constructed line with some interesting engineering features.

The whole route from Matapedia to Gaspe is most picturesque, with a charming variety of scenery, embracing the Baie de Chaleur, the Gulf of St. Lawrence and Gaspe Bay and the wooded mountainous country reaching back from the shores, which offers great attractions to tourists, to salmon and trout fishermen and for moose and cariboo as well as a variety of bird shooting.

The train dispatching on both lines is done from New Carlisle by telephone, and it is said that the line now operated as the Quebec Oriental Ry. was the first in Canada to equip its trains with portable telephone apparatus.

Superheated Steam in Locomotive Service.

The conclusions arrived at concerning the use of superheated steam as obtained in a series of experiments reported in the University of Illinois Engineering Experiment Station bulletin 57, may be summarized as follows:—

Superheated steam may be successfully used in locomotive service without involving mechanism that is unduly complicated or difficult to maintain.

Evidence points to the fact that the various details of the locomotive that come in contact with the highly superheated steam give little trouble as regards maintenance, and are not among the members usually most in need of repair when the locomotive is shopped.

Superheating materially reduces the consumption of both water and fuel, and increases the power capacity of the locomotive.

The locomotive tested had boiler and superheating surface of 943 and 193 sq. ft. respectively, superheating approximately 150 degs. The superheat decreases with increased boiler pressure, and vice versa, in the following relation:—

$$T=123-0.265P+7.28H$$

where T is superheat, P the boiler pressure, and H the equivalent evaporation per foot of water-heating surface per hour.

The evaporative efficiency of the boiler and superheater is

$$E=11.706-0.214H$$

where H is the equivalent evaporation per hour per foot of water-heating and superheating surface.

The addition of the superheater to a boiler originally designed for saturated steam involved some reduction in the area of the heat-transmitting surface, but the efficiency of the combination when developing a given amount of power, was not lower than that of the original boiler.

The ratio of the heat absorbed per foot of superheating surface to that absorbed per foot of water-heating surface, ranges from 0.34 to 0.53, the value increasing as the rate of evaporation increases.

When the boiler and superheater are operated at normal maximum capacity, and when they are served with Pennsylvania or West Virginia coal, the available heat supplied is accounted for approximately as follows:—

Absorbed by water	52%
Absorbed by steam in superheater	5%
Total utilized	57%
Lost in vaporizing moisture in coal	5%
Lost in CO	1%
Lost through high temp. of escaping gases	14%
Lost in form of sparks and cinders	12%
Lost through grate	4%
Lost through radiation, leakage, etc.	7%

The water consumption under normal conditions of running for boiler pressures of 120, 160, 200 and 240 lbs., respectively amounts to 23.8, 22.3, 21.6 and 22.6 lbs. per i.h.p. per hour.

The coal consumption under normal conditions of running at the following boiler pressures of 120, 160, 200 and 240 lbs., is respectively 3.31, 3.08, 2.97 and 3.12 lbs. per i.h.p. per hour.

Neither the steam nor coal consumption is materially affected by considerable changes in boiler pressure, a fact that justifies the use of comparatively low pressures in connection with the superheating.

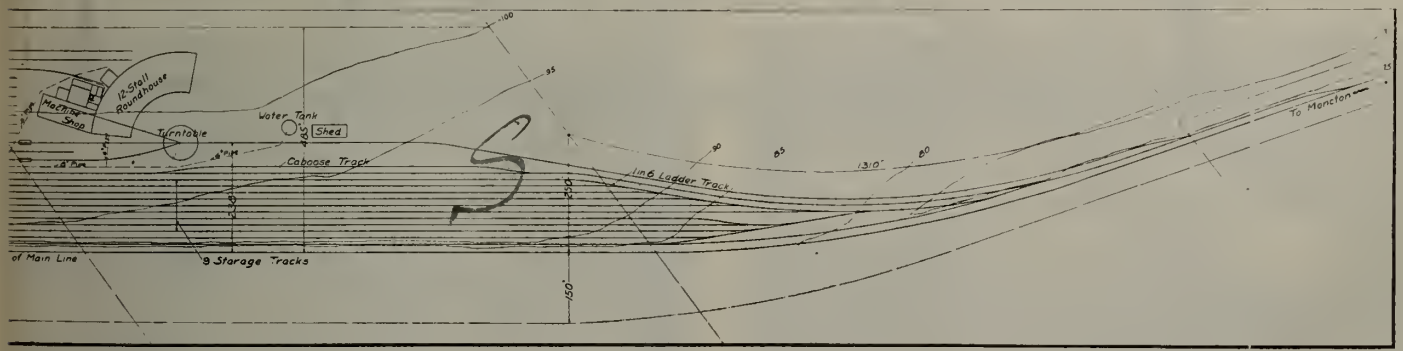
Contrary to the usual conception, the conditions of cut-off attending maximum cylinder efficiency are substantially the same for steam superheated 150 degs. as for saturated steam. With superheated steam, when the boiler pressure is 120, the best cut-off is approximately 50% of the stroke, but this value should be diminished as the pressure is increased, until at 240 lbs. it becomes 20%.

Tests under low steam pressures for which the cut-off is later than half-stroke, give evidence of superheat in the exhaust.

The saving in coal between a saturated and a superheated locomotive varied from 18% at 120 lbs. to 9% at 240 lbs. The saving in water under the same conditions and between the same limits varied from 17% to 6%.

The power capacity of the superheating locomotive is greater than that of the saturated steam locomotive.

The above results are based on the results of a series of tests at the Purdue University Testing Laboratory conducted by Dr. W. F. M. Goss, and extending over a period of eight years, the locomotive tested being an eight wheel American equipped with a Cole superheater. Under four different pressures, 4,851 miles were run off during the experiments, so that the observations may be considered as being quite as accurate as experimental results can be.



Transcontinental Ry. Terminals at Moncton.

The C.P.R. has transferred its local freight offices at Fort William, Ont., to a new building just above shed 5 on the Kaministikwia River.

F. G. MARTYN, Assistant Superintendent, C.P.R., West Toronto, writes:—"I feel quite justified in saying that Canadian Railway and Marine World is the best journal dealing with railway matters printed to-day. I wish it continued success."

During June, 13 employes were killed, and 23 were injured in the course of their work in connection with Canadian steam railways. Of the fatalities, five were due to collisions, three to being run over, two each to being crushed and being struck by trains, and one to a fall.

Canadian Pacific Railway Bascule Bridge Over Kaministikwia River.

A large bascule bridge is being built across the Kaministikwia River at Fort William, Ont., for the C.P.R. It is a combination bridge, for the handling of both railway and highway traffic, a lower deck with a double track providing for the railway requirements, while on an upper deck there are two street car tracks in addition to a roadway and footpath on each side. The double deck feature in bascule bridge construction is said to be unique, and it is reported that there is no other bridge of the bascule construction containing a double deck that is quite as large, although there are a couple of single deck bascule bridges under construction that are considerably larger than this one.

The Kaministikwia river, at the point where the railway crosses, has a clear channel of 125 ft., but as the line crosses the river at an angle, a clear span of 186 ft. is required. This leaves the channel perfectly clear when the lift is raised into the open position. The construction of the bridge is rather out of the ordinary, as an inspection of the accompanying illustration will show. The main span is pinioned on a main trunnion at the forward end of the triangular tower. On the top of this tower, a cantilever counterweight arm is trunnioned, the counterweight overhanging the right end of the bridge, the opposite end being connected by a connecting link with pins at both ends to a point along the lower part of the span member as indicated. As the main span swings on the main trunnion, the counterweight cantilever at the same time moves through a similar angle, as the pins are so located as to form a parallelogram The counterweight on the outer end of the counterweight arm is a solid mass of concrete, of such a weight as to maintain the weight of the main span in a state of equilibrium, the only power required to raise the span being that necessary to overcome the friction of the parts.

The operation of the bridge is rather unique. Pinned to the front of the towers on each side are operating struts, on the lower edge of which are long racks each engaging at the outer end with a pinion. This pinion is connected through gearing to an 85 h.p., 490 r.p.m. 550 v. 60 cycle motor fitted with solenoid brakes. These two motors are mounted on the towers, as indicated in the illustration. The motors, when operating, revolve the pinion, which moves along the rack on the lower face of the operating strut. This action lifts the spans. As the bridge moves up, the motors move through the same angle, which in the highest position is 80 degs.

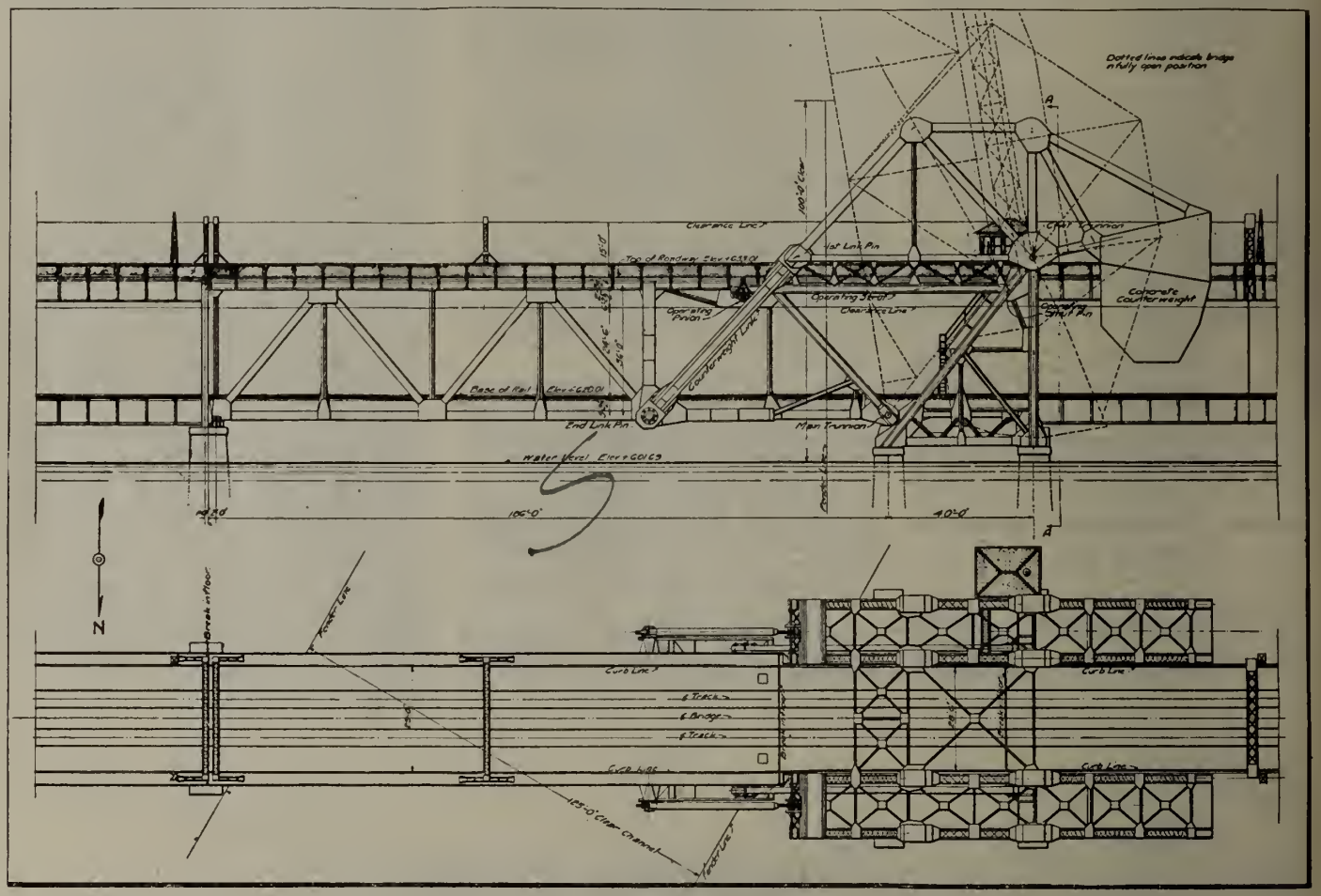
At the outer end of the span there are two lock motors of 5 h.p. each at 810 r.p.m on 550 v. 60 cycle. These operate the locks through worm gearing. There is also a 3 h.p., 3 phase 550 v. motor geared to a crank disc to operate the emergency brake.

When the bridge is closed and ready for traffic, the lock signal switch and the bridge signal switch are both closed, and the contacts in the circuits of the main operating motors and the lock motor are open. To open, the danger signal is first set. The action of so doing energizes the contactor points of the lock motor, causing them to close, when by the closing of the lock motor circuit breaker by the operator, the locks are withdrawn. The lock moving out automatically changes the light in the signal tower from white to red, indicating that the bridge is closed to traffic. Similar changes in light occur on the operator's panel.

Until the end locks are withdrawn, the contactors of the operating motors remain open. When withdrawn, these contactors are closed, so that the operator can, as soon as the light signals that the time is proper, energize the main motors through the controllers. The first notch of the controller merely opens the solenoid brakes. This position can be used at any time when it is desired to coast. The starting of the span on its upward movement opens the lock motor contactors so that the latter cannot operate by accident.

The closing of the span is performed by the reversing of the operations outlined, and the signal lights show up in the same reverse order. Air buffers are provided to take up any shock when the span strikes the abutments. If the bridge is travelling too fast, these air buffers will cause the motors to overload and trip the oil switch. The operators cabin, at the top of one of the towers, is fitted with a complete electrical control outfit, including switch board and the necessary attachments.

The structural steel work and mechanism were fabricated and erected by the Canada Foundry Co., Ltd., and the electrical equipment was furnished and installed by the Canadian General Electric Co., Ltd.



Bascule Bridge across the Kaministikwia River.

Railway Lands Patented.—Letters patent covering Dominion lands in Manitoba, Saskatchewan, Alberta and British Columbia, were issued during June, as follows:—

	Acres.
Calgary and Edmonton Ry.	1,104.00
Canadian Northern Ry.	644.00
Grand Trunk Pacific Ry.	20.47
Total	1,768.47

Railway Mechanical Methods and Devices.

Moulding Grease Cellars at the C.P.R. West Toronto Shops.

A special method of forming in moulds the locomotive driving axle grease cellars is in use in the C.P.R. West Toronto locomotive shops, A. Dixon, general foreman. The method used is shown in the accompanying four illustrations.

Customarily, the grease is moulded into the driving axle cellars in a piecemeal manner, packing the grease into position as the work progresses. This method, while giving eminently satisfactory results, is slow, and requires careful work to give these good results. In consequence, it was considered that some purely mechanical method of forming them, if it were possible to devise such a scheme, would be much more preferable. The method outlined in this article is the result.

The moulding machine is shown in figs. 1 and 2. Trunnioned on a shaft, A, there is a hollow cylinder, B, bored the full length to the diameter of the plunger head, C. This cupped plunger head, C, is attached to the end of a piston rod, on the other end of which is a piston in the air cylinder, D. Both the air cylinder D, and the plunger cylinder trunnion support, A, are mounted on a frame built up of channel sections, raised from the floor on bent bar sections, all as indicated in figs. 1 and 2. In the front channel, there is a small diameter air cylinder, E, containing a piston connected to the crosshead, C. This cupped plunger head, C, A short link from this crosshead connects with the lower end of the arm, which is keyed to the trunnion shaft of the plunger shell, B, through which the latter receives its motion from the small air cylinder, E.

On the forward end of the hollow shell, B, there is a die-head, H, bolted thereto as fig. 2 shows. This die has an aperture through which the grease is forced, of the same shape and size as the section of the largest grease cellar that is required to be filled. The face of the die opening is machined off, and has projecting studs by which different sized apertures may be bolted on to give the different sizes of grease blocks that are required by various journals.

The operation of the machine is as follows: With the hollow cylinder, B, in its vertical position, as indicated in fig. 1, it is filled with axle grease—cleaned grease, scraps and new stock—this being lightly pressed down into the bottom. Turning the air handle, I, to the left lets air in behind the piston in the cylinder E, forcing it forward, lowering the shell B into the position assumed in fig. 2. The air valve, J, is next turned to the left, forcing the air plunger forward, entering the plunger head, C, into the shell, B, against the grease contained therein. By regulating the intensity of the pressure in this cylinder, D, the grease can be forced out through the forward end of the die aperture. A block some 3 or 4 ft. in length is forced out on to a board, and cut off with a piece of thin sheet metal. If the shell has been sufficiently charged, two or three such blocks may be cut off without reloading. The air handles are again reversed, bringing the machine back into the position in fig. 1.

These long blocks of grease, as they come from the machine on the supporting board, are placed on a table and cut up into short blocks of the required length to fit the grease cellars, into which they may be slipped without any further work. The blocks are cut off as before with a thin piece of sheet metal.

If, however, the correct size of grease forcing die to attach to the end of the trunnioned shell is not to be had through the fact that that particular size is not in sufficient demand to cause such a one to be made, or for any other reason one is not available, the next larger size is used, and the surplus grease trimmed off in the manner indicated in fig. 4. A cut off block of grease is dropped into the cellar as indicated at A. Then, with a hammer, or any such convenient tool, the grease is forced down to fit into the cellar, as at B. This operation packs the grease into a solid mass, and is even freer from imperfections than the original die pressed block. Following this with a sharp edged bar of metal, the surplus grease is removed from the cellar, the circular forms in the end plates guiding the cutting tool through the grease leaving the finished grease cellar in the form indicated at C.

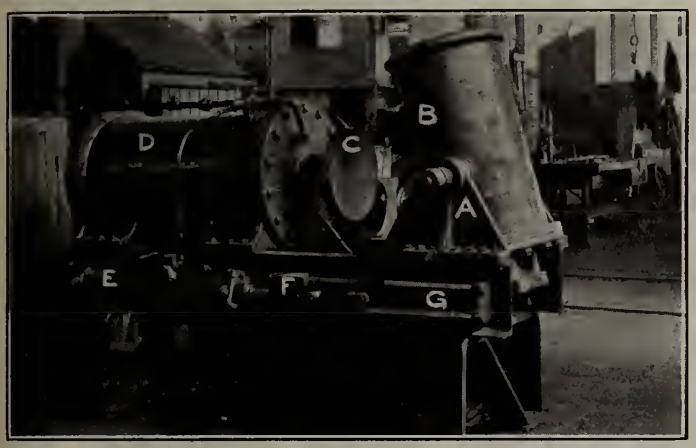


Fig. 1. Grease Cellar Moulding Machine in Open Position.

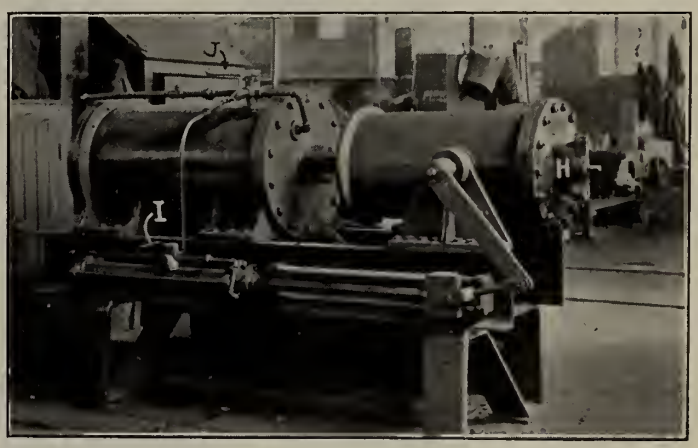


Fig. 2. Grease Cellar Moulding Machine in Operation.

Fig. 3. Blocks of Grease from the Moulding Machine.

Fig. 4. Moulding the Blocks into the Grease Cellars.

The G.T. Pacific Ry. has put in operation a regular tri-weekly passenger and freight train service from Prince Rupert to Van Arsdol, B.C., in place of the mixed train heretofore operated.

D'Arcy Scott, Assistant Chief Commissioner, Board of Railway Commissioners, turned the first sod on the site of the Canadian Car and Foundry Co.'s new plant at Fort William, Ont., recently.

Repairing Air Hose at the Central Vermont Railway Shops.

In several previous issues of Canadian Railway and Marine World, various arrangements and devices in use in the different railway shops throughout the country for the never ceasing task of renewing and repairing air and steam hose have from time to time been described, especial emphasis being given to the fact that the number of such devices to be found would seem to be legion, each shop having a method peculiarly its own, with special advantages and disadvantages accompanying each. To determine the best one out of such a large selection would be a difficult task, as they have so many inherently good features, each one seeming to meet the particular requirements of the shop in which it is located.

The accompanying two illustrations show the arrangement as used in the Central Vermont Ry. Shops at St. Albans, Vt. It is essentially the same as most of the others previously described, working with a series of air cylinders and guiding ways, with the one advantage that the attachments are so varied as to make it equally useful for all stages of hose renewal, the whole construction and operation being withal very simple. The details of construction are shown in fig. 1, and the machine as installed, in fig. 2.

Referring to fig. 1, it will be noticed that there is a horizontal cylinder, A, similar to the one to be found in the usual construction, and a vertical cylinder, B, under the table, N. On the table, N, there is a block, M, carrying a guiding casting, L, along which the lower half of the clamp C, is free to slide. The upper half of the clamp is suspended from the clamp lever K, one end of which is attached to the upper end of the plunger from the cylinder B, and fulcrumed near the centre on a standard L. The lower end of the standard L, fits a channel in the circular slide J, so that the upper clamp section can swing through an arc of about 90 degs.

On the face of a block at the left end of the table, the coupler piece is attached to corresponding coupler on that face, and on the plunger end there is the threaded hose nipple, and in the clamp, the hose is secured. Admitting air into the cylinder A, forces the plunger forward, forcing both nipples into the hose, the carriage C accommodating the hose to the new positions assumed as the nipples move further into the hose ends.

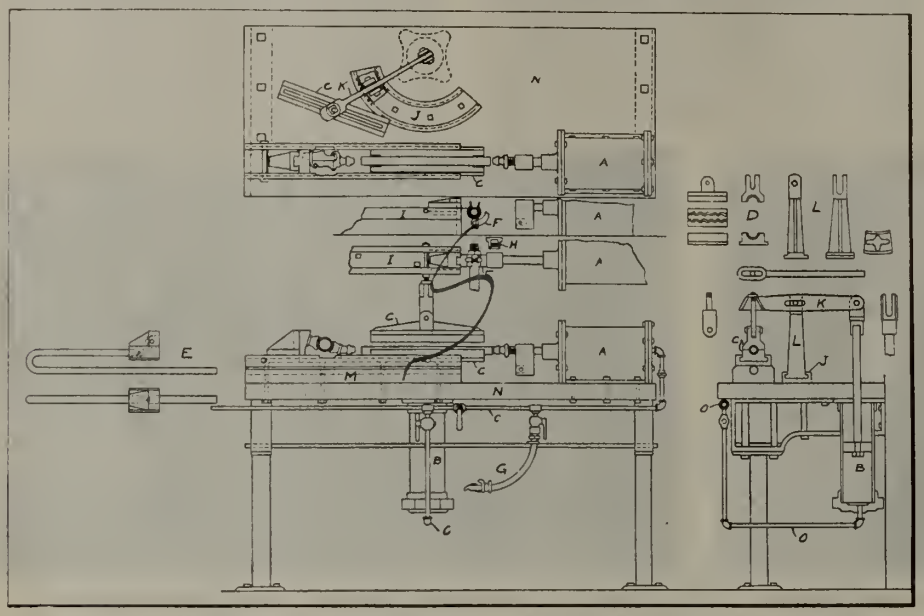


Fig. 1. Details of Machine for Mounting and Dismounting of Air Hose Connections.

For the fitting on and tightening up of the hose clamps, the attachment F, is slipped into vertical channels in the face of the member I. Forcing forward the block face of the plunger against the open jaws of this attachment containing an open coupler clamp, closes the latter tightly so that the operator can quickly screw up the clamping bolt. Both ends being the same as regards the clamp, can be fixed in a similar manner.

The machine has attachments also for the removal of old connection nipples. Through a horizontal hole along the centre of the block M, the lower rod of the attachment E is slipped and attached to the block on the end of the plunger of cylinder A, in the hole near the lower edge. To the face of the block of attachment E, the permanent coupler is attached, to which the coupler of the hose to be repaired is connected, and after clamping as before, by the admission of air into the cylinder, the force on the hose is in the opposite direction, dismantling the end pieces from the hose. The clamping sections for the machine to replace the ones used in the mounting operation are those shown to the right at D. One end is removed at a time, the carriage being made stationary by the insertion of a pin through the part I into the carriage.

The machine as installed is shown in fig. 2. The different sized attachments for the steam and air hose may be noticed on the shelf below. To the left are the bins for the storage of the hose after completion, and they are also used to temporarily store the hose during the steps through which the hose passes in going through the machine. The control handles for all the valves are located conveniently for the operator in the front of the machine, as may be seen.

Heavy One-Piece Forging at the Montreal Locomotive Works.

A rather heavy forging to be produced in a single heat under the steam hammer is shown in the accompanying illustration of a locomotive connecting rod. The billet from which the rod was forged had a section 6 x 15 ins. The practice outlined, is that of the Montreal Locomotive Works.

The original dimensions at the large section of the rod, the right end in the illustration, were not altered appreciably. The 6 x 15 in. bar, heated through the required length to a bright red working heat, was brought under a large steam hammer, handling the hot bar by tongs from a hydraulic crane, by means of which the billet could be changed about under the stroke of the hammer. The right hand tip was first drawn down to the shape indicated, followed by a reduction of the body of the rod to the left, to the point where it was still attached to the original bar. All this was performed in a single heat, and yet the forging was still sufficiently hot at the expiration of the reduction to shape to make possible a further reduction were this necessary. This demonstrates the dexterity of the operator, W. W. Shackford, foreman hammersmith, who personally handles all the heavier and more complicated pieces of forging. Not only must the work be done quickly to make production in one heat possible, every move telling, but great skill is also shown

Fig. 2. Installation of Machine for Repairing Air Hose.

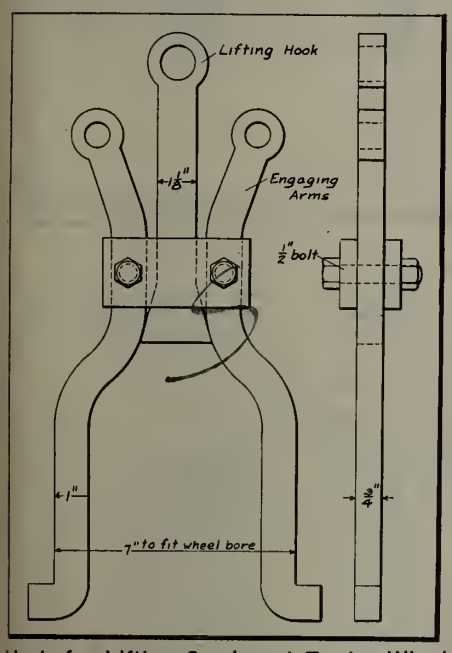
800 lbs. Forging Made in a Single Heat.

in the manner in which the forging is kept down to such dimensions as to make the machining as light and as uniform as could reasonably be expected.

On the completion of the forging on the end of the bar, it was cut off and allowed to cool, no further forging on the rod being necessary. The forged rod at this stage weighed 800 lbs. The production of rods in this manner in a single heat, and close to the required dimensions, as the rod illustrated, is common practice with this company, and represents everyday work.

Hook for Lifting Coach and Tender Wheel Centres at the C.P.R. Angus Shops.

The hook for lifting coach and tender wheel centres is an idea developed in the C.P.R. Angus shops, Montreal, where it is used in the tender department. In Canadian Railway and Marine World, for March last, the process of mounting and dismounting tires from the centres in this department of these shops was described, and if the process be recalled, it will be remembered that the steel centres



Hook for Lifting Coach and Tender Wheel Centres.

are placed flat on the floor and the heated tires slipped over them and allowed to cool in that position. In the placing of these centres in this manner on the floor, is where the hook device described herewith is employed.

The construction of the hook consists of two engaging arms, fulcrumed on bolts in two retaining distance pieces. Between these arms, and held in the same retaining pieces, there is a lifting hook, the lower end of which is tapered from the bottom upward so as to engage the side arms when drawn up. The lower parts of the side or engaging arms have the sides so formed as to be parallel when inserted in the bore of the wheel centre the hook is designed to lift.

To use, the lifting hook is allowed to drop into its lowest position, and the upper part of the engaging arms swung outward, permitting the entry of these hook ends into the wheel centre bore. Then, by swinging the tops of the engaging arms together and pulling upward on the lifting hook, holds the hooks under the lower face of the wheel bore. The crane chain is attached to the lifting hook. The advantage of such a lifting device lies in the fact that the centres do not need to be raised by the flanges and flopped over into location, but are placed in the desired position by lifting from the flat.

Birthdays of Transportation Men in September.

Many happy returns of the day to:—

G. W. Alexander, Local Treasurer, G.T.R. Western Lines, Detroit, Mich., born at Lightcliff, Yorks, Eng., Sept. 10, 1859.

H. Bailey, Bridge and Building Master, Dominion Atlantic Ry., Yarmouth, N.S., born at Huntsville, Ont., Sept. 2, 1879.

W. B. Bamford, Division Freight Agent, Atlantic Division, C.P.R., St. John, N.B., born at Belleville, Ont., Sept. 10, 1863.

W. D. Barclay, General Manager, Canadian Northern Quebec Ry., Quebec and Lake St. John Ry., Halifax and Southwestern Ry., and Inverness Ry. and Coal Co., Quebec, Que., born at Campbellton, N.B., Sept. 23, 1852.

G. T. Bell, Assistant Passenger Traffic Manager, G.T.R. and G.T.P.R., Montreal, born there, Sept. 7, 1861.

W. H. Biggar, K.C., General Counsel, G.T.R. and G.T.P.R., Montreal, born at the Carrying Place, near Trenton, Ont., Sept. 19, 1852.

E. R. Bremner, ex-Division Freight Agent, G.T.R., Ottawa Division, Ottawa, born at Toronto, Sept. 9, 1875.

M. H. Brown, Division Freight Agent, Ontario Division, C.P.R., Toronto, born at Victoria Square, Ont., Sept. 2, 1866.

W. G. Brownlee, ex-General Transportation Manager, G.T.R., Montreal, born at Lawrenceville, Ill., Sept. 9, 1858.

W. B. Bulling, ex-Assistant Freight Traffic Manager, C.P.R. Eastern Lines, Montreal, born there, Sept. 16, 1858.

C. F. Burns, Auditor of Disbursements, Intercolonial Ry., Moncton, N.B., born at Clements Port, N.S., Sept. 10, 1854.

A. D. Cartwright, Secretary, Board of Railway Commissioners, Ottawa, born at Kingston, Ont., Sept. 20, 1864.

A. W. Davis, Locomotive Foreman, G.T.R., Stratford, Ont., born at Sittingbourne, Kent, Eng., Sept. 5, 1864.

A. S. Dawson, M. Can. Soc. C.E., Chief Engineer, Department of Natural Resources, C.P.R., Calgary, Alta., born at Pictou, N.S., Sept. 6, 1871.

O. L. Dickeson, President, White Pass and Yukon Route, Vancouver, B.C., born at Ottumwa, Ia., Sept. 16, 1877.

W. E. Duperow, General Agent, Passenger Department, Grand Trunk Pacific Ry., Vancouver, B.C., born at Stratford, Ont., Sept. 4, 1872.

W. H. Estano, Traffic Auditor, Intercolonial Ry., Moncton, N.B., born at Halifax, N.S., Sept. 29, 1874.

C. B. Foster, General Passenger Agent, C.P.R. Western Lines, Revelstoke and east, Winnipeg, born at Kingston, N.B., Sept. 30, 1871.

J. P. Ferguson, representing Galena Signal Oil Co., Ottawa, Ont., born at Drummondville, Que., Sept. 12, 1856.

D. W. Hatch, Travelling Agent, Atchison, Topeka and Santa Fe Ry., Montreal, born at Bedford, Que., Sept. 1, 1841.

J. E. Hutcheson, General Manager, Montreal Tramways Co., Montreal, born at Brockville, Ont., Sept. 15, 1858.

W. H. Kelson, ex-General Storekeeper, C.P.R., Montreal, born at Bath, Eng., Sept. 5, 1850.

C. B. King, Manager, London St. Ry., London, Ont., born at Galena, Ind., Sept. 12, 1871.

R. E. Larmour, Division Freight Agent, British Columbia Division, C.P.R., Vancouver, born at Brantford, Ont., Sept. 26, 1868.

H. D. Lumsden, C.E., ex-Chief Engineer, National Transcontinental Ry., Ottawa, born at Belhaire, Scotland, Sept. 7, 1844.

F. J. Mahon, Superintendent Telegraphs, C.P.R. Eastern Division, Montreal, born there, Sept. 18, 1865.

R. E. Merkley, Trainmaster, District 3, Manitoba Division, C.P.R., Brandon, born at Ottawa, Sept. 3, 1882.

J. F. Mundle, City Freight Agent, C.P.R., Montreal, born at Prescott, Ont., Sept. 20, 1857.

M. B. Murphy, Superintendent, District 2, Central Division, Canadian Northern Ry., Winnipeg, born at Napa, Cal., Sept. 11, 1866.

B. S. Murray, Route Agent, Canadian Express Co., London, Ont., born at Glenwood, N.Y., Sept. 17, 1856.

J. Paul, District Freight Agent, Canadian Northern Ry., Winnipeg, born in Euphrasia tp., Grey Co., Ont., Sept. 13, 1858.

W. J. Pickrell, Master Mechanic, District 1, Ontario Division, C.P.R., West Toronto, born at London, Ont., Sept. 15, 1880.

C. S. Richardson, District Freight Agent, C.P.R., Buffalo, N.Y., born at New York City, Sept. 26, 1870.

W. D. Robb, Superintendent of Motive Power, G.T.R., Montreal, born at Longueuil, Que., Sept. 21, 1857.

W. H. Rosevear, ex-General Car Accountant, G.T.R., Montreal, born at Wadebridge, Cornwall, Eng., Sept. 26, 1837.

F. W. Sterling, Travelling Freight Agent, C.P.R., Vancouver, B.C., born at Thornbury, Ont., Sept. 14, 1881.

E. W. Taylor, General Freight Agent, Reid Newfoundland Co., St. John's, Nfld., born at Carbonear, Nfld., Sept. 8, 1870.

Sir William Whyte, Director, C.P.R., Winnipeg, born at Charleston, Scotland, Sept. 15, 1843.

H. A. Young, Traffic Manager, Canadian Lake Line, Toronto, born at Brooklyn, N.Y. Sept. 1, 1864.

C.P.R. Station at Calgary.

The ground floor plan of the enlarged station at Calgary, Alta., shows a building with a total frontage of 514 ft., and a general width of 46 ft. In the centre there will be a general waiting room, 74 by 46 ft., with a vestibule on the street side along the whole 74 ft., from which there will be two stairways to the offices above. On the east side, immediately off the general waiting room, a corridor will run through to the baggage room, which will be 62 ft. long, and will have direct access to the street and to the track. On the street side of the corridor, leading out of the general waiting room will be the women's waiting room and retiring room; baggage-checking and baggage transfer offices and vaults, while on the track side, will be the smoking room, men's lavatories, room for trainmen, parcel office, and offices for the baggage master and customs officials.

The company's telegraph department offices are located in the recently built extension to the east wing. The west wing now under construction, which it is expected will be completed on October, has a frontage on the track of 226¾ ft. The ticket office immediately adjoins the general working room, and a corridor on the street side leads to a large luncheon room, pantry, etc. Beyond this is the express room, express office, and stairway to offices located on the first floor.

The central portion of the building was erected, but the eastern extension was then made, and the western extension is now being added. With the addition of this latter extension the central portion is being rearranged, so as to provide for the large general waiting-room. The entire building is of reinforced concrete with Calgary stone facing. Sharp and Co., Winnipeg, have the contract for the present addition.

The Canadian Northern Prairie Lands Co.'s sales during June amounted to 640 acres, realizing $9,760, an average of $15.25 an acre. To the end of June there remained unsold 69,240 acres.

THE DESIGN AND CONSTRUCTION OF LOCOMOTIVE BOILERS.

Report of American Railway Master Mechanics' Association's Committee.

Following is the report of the Standing Committee, of which D. R. MacBain, Superintendent, Motive Power, Chicago, Rock Island and Pacific Ry., was chairman, as presented at the association's convention at Atlantic City, N.J., recently:—

Your committee sent out a circular of inquiry to all the members of the association in regard to their experience and recommendations concerning construction of locomotive boilers. We received replies from 21 members, comprising a total of 22,900 locomotives, which is about one-third of the locomotives represented. The intention of the committee is to give the different members the benefit of the experience of the different roads.

TYPE OF BOILER.—In no case is a special type of boiler used for any special service. One of the members advises that they use Belpaire boilers of crown bar construction for road locomotives entirely on account of greater ease in maintaining staybolts. Another member advises that they use the Belpaire boiler as well as the radial stay boiler, and their experience with the Belpaire is that it reduces the number of staybolt breakages, which has been proved by the records of staybolt breakages. From the experience that they gained with Belpaire boilers they developed a system of cross-bracing, shown by fig. 1, which has practically all the advantages of the Belpaire staying, and in addition it reduces the dead weight and is cheaper to construct.

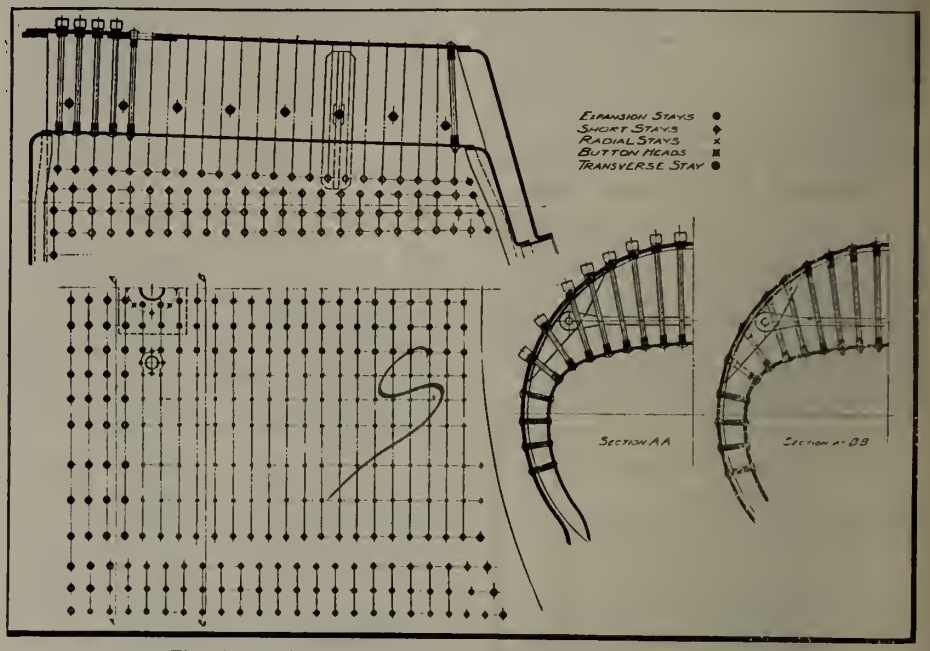


Fig. 1. Boiler Bracing Embodying Advantages of the Belpaire.

Crown bar construction is not used to any extent on wide firebox boilers, but a few roads use it on narrow-type fireboxes. On the crown bar type of boiler it is found to be a hard matter to keep the crown bars free from mud, but in renewing fireboxes on this class of locomotive, beneficial results have been obtained by raising the crown bars and inserting higher washers—1½ to 2 ins.

The committee was unable to get any data in regard to merits of Belpaire boiler compared with the radial stay boiler, as far as maintenance and boiler performance is concerned.

From the replies received from the different members it is the consensus of opinion that the radial stay type of boiler is preferred, as it is easy to construct, giving more free circulation of water, less deposit of sediment on the crown sheet and easier to wash out; also the dead weight is kept down considerably.

COMBUSTION CHAMBERS.—From the replies received the combustion chamber is only favored by five members. One member, who uses the combustion chamber covered by fig. 2, advises that it shows a great economy in fuel, a decrease in the amount of smoke, and cinders and increased mileage. No information was given in regard to maintenance. Another member advises that the reason they favor the combustion chamber in certain types of boilers, such as

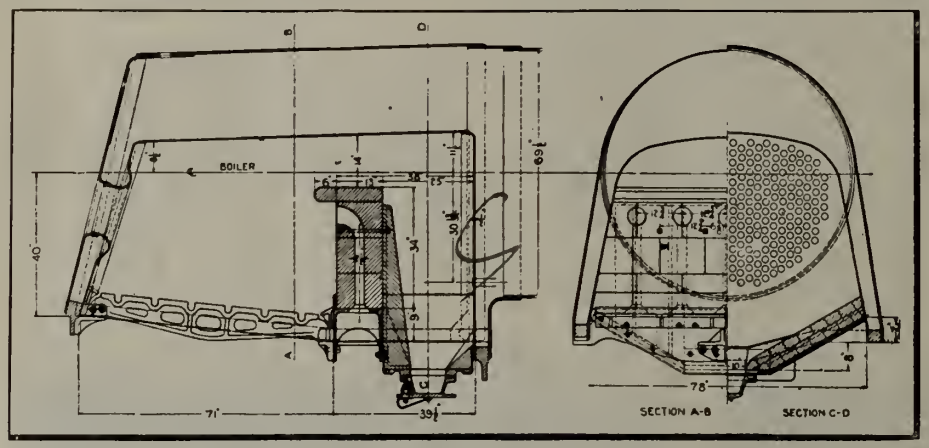


Fig. 2. Firebox Showing Great Economy in Fuel.

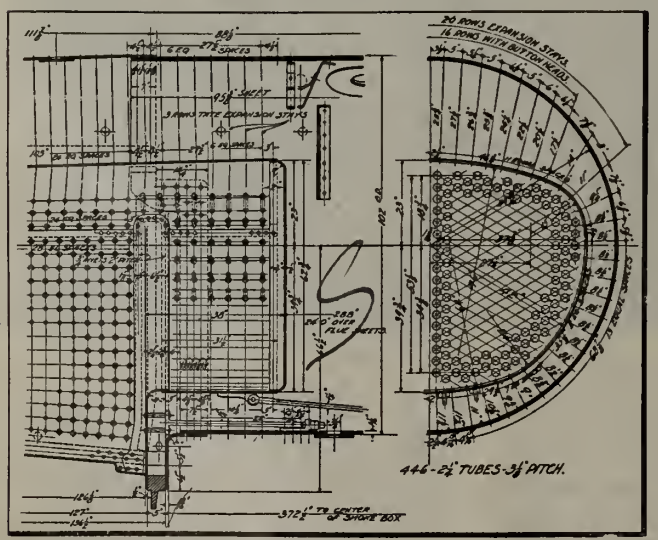


Fig. 3. Combustion Chamber with Low Maintenance Cost.

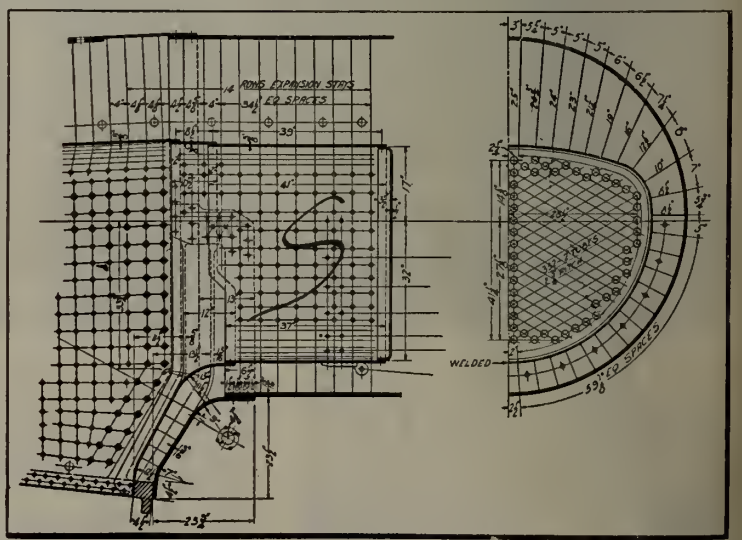


Fig. 6. Combustion Chamber Difficult to Maintain Tight Seams.

Mallet, is that it keeps the tubes a reasonable length and increase the heating surface of firebox. No information was moved on account of costing too much to maintain.

The advantages claimed by the use of combustion chamber are that it keeps the tubes within a reasonable length, protects the flue beads, increases the firebox heating surface and gives better combustion.

Your committee feels that a combustion chamber is desirable on boilers with extra long flues, such as Mallet and Mikados, but are not prepared to recommend any particular design.

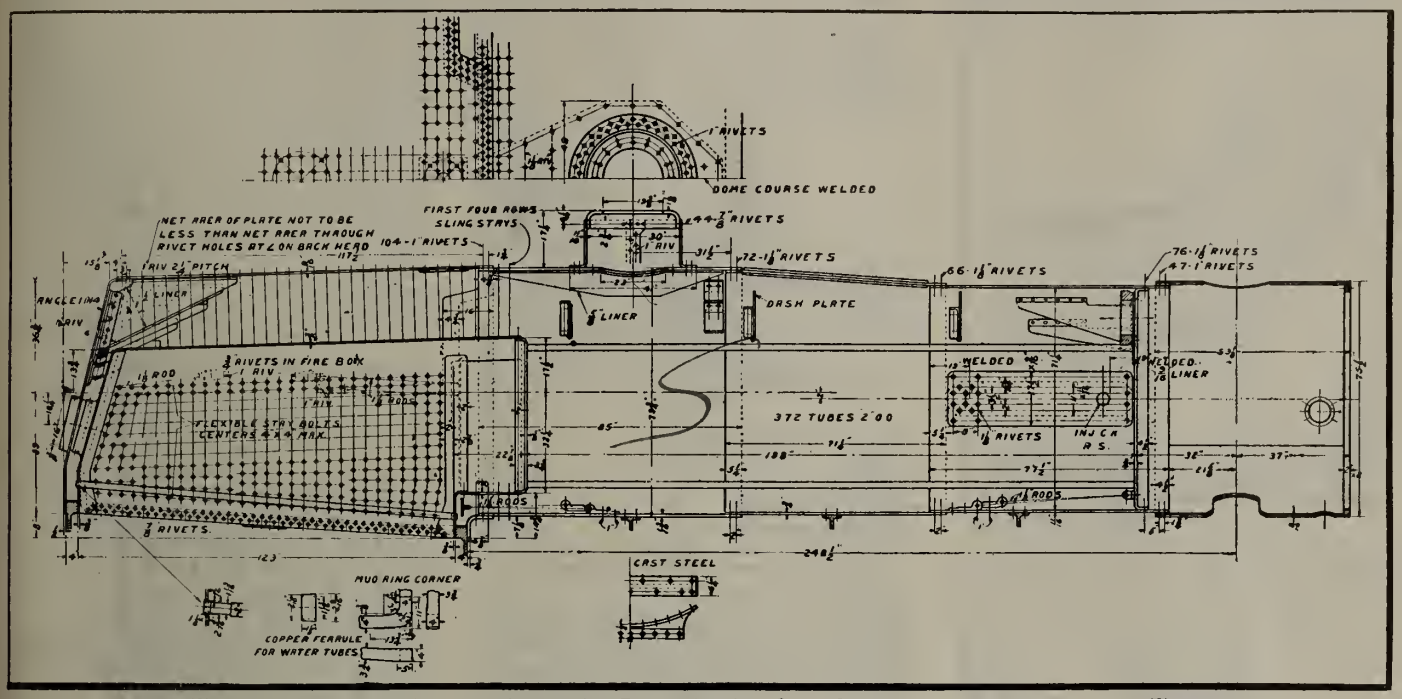


Fig. 4. Combustion Chamber, Anthracite Road, showing Good Combustion and Protection of Flues.

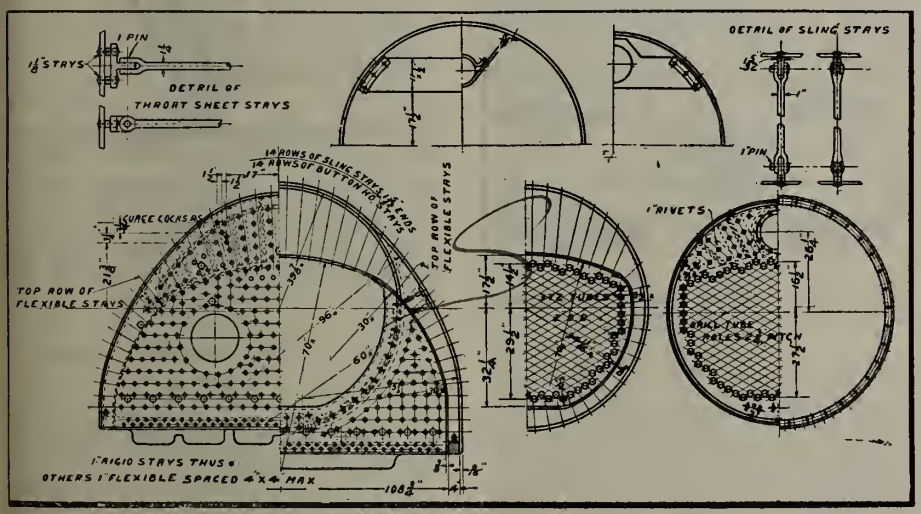


Fig. 5. Details of Anthracite Road Combustion Chamber.

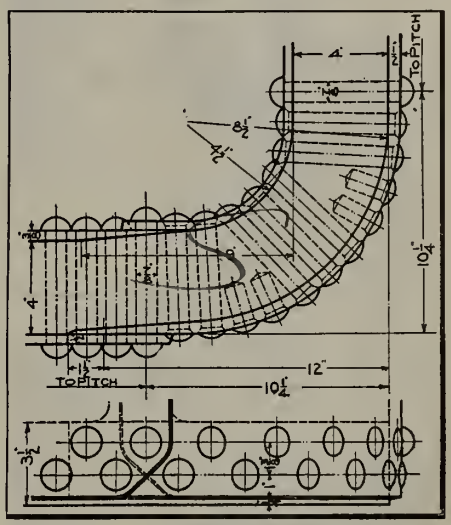


Fig. 8. Type of Mudring Corner.

have had all combustion chambers regiven as to the fuel economy derived from these combustion chambers, but a saving in maintenance and an improvement in performance is reported. The type of combustion chamber he uses is covered by fig. 3.

Another member reports being in favor of combustion chambers, but does not have them on all locomotives. This member was from an anthracite road and the particular claim was they thought they got better combustion and also derived a good deal of benefit in the way of protection of flues, particularly so, the boxes being extremely shallow below the flue sheet. Type of combustion chamber used by this member is shown in figs. 4 and 5.

Another member advises that they have had five passenger locomotives with combustion chambers, as shown in fig. 6, but considerable difficulty was experienced keeping the seams tight, and on account of this fact combustion chambers were removed when applying new fireboxes. This was the first development of the combustion chamber which has been materially improved since that time.

Another member advises that they

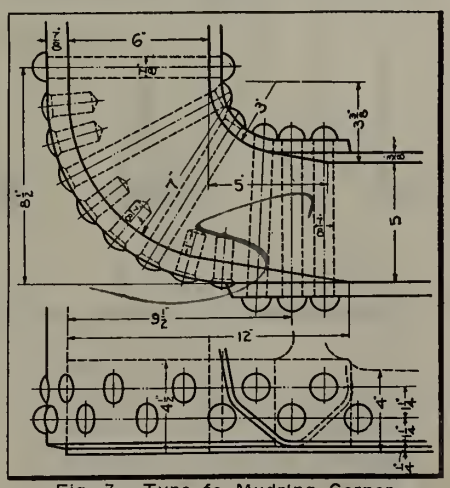


Fig. 7. Type fo Mudring Corner.

FIREBOX.—Continuous crown and side sheets are favored by all of the members except one.

Therefore, the committee recommends the use of continuous crown and side sheet for new construction or with renewal of firebox.

MUD-RING CORNERS.—Type of mud-ring corners which have been giving good service are shown in figs. 7, 8, 9, 10, 11 and 12. One member advises that they use a cast iron plate held in place with a ¾ in. bolt and a cast steel clamp, leakage prevented by a composition joint. No prints were attached to his reply and therefore cannot illustrate same.

Your committee recommends mud ring with large radius, as shown on any one of the illustrations and the flanges of the tube and door sheet should be carried back far enough to get at least three straight rivets through the ring. Scarf the inside sheets down to be properly fitted to the mud ring by heating the same. If the scarfing and the fitting of these sheets is given proper attention it will overcome leaky mudring corners

that some of the members are now experiencing considerable difficulty with.

THROAT SHEET.—From the replies received, the distance from the top of the grate to the bottom of the lowest

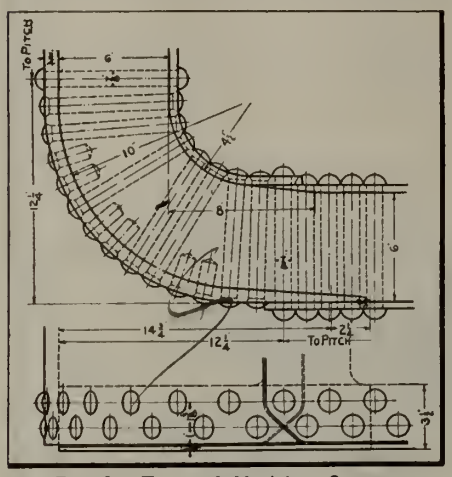


Fig. 9. Type of Mudring Corner.

boiler tube on wide firebox engines is a minimum of 14 ins. and a maximum of 26 ins., average about 22 ins. Narrow fireboxes have a minimum of 13 ins. and a

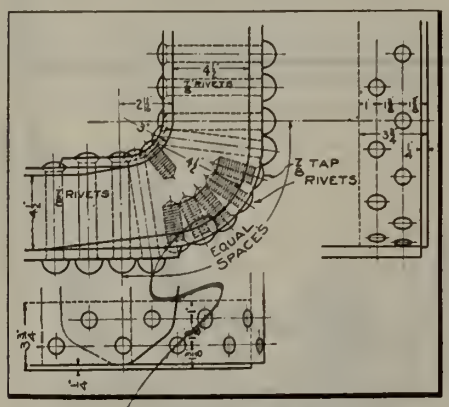


Fig. 10. Type of Mudring Corner.

maximum of 28½ ins., average about 20 ins. One member who uses hard coal, advises a distance of 8⅛ ins. minimum and 12 ins. maximum. This height is

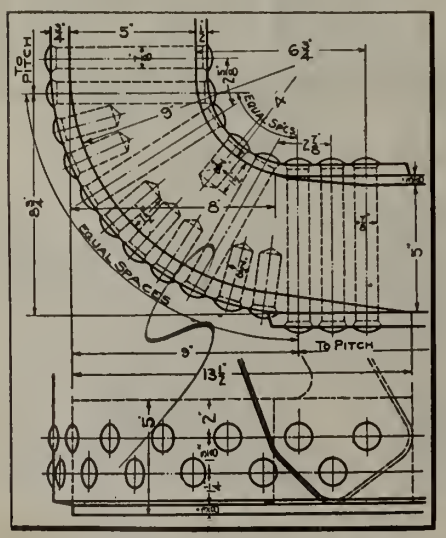


Fig. 11. Type of Mudring Corner.

limited due to the design of the locomotive.

Your committee recommends as deep a throat sheet as the design of the locomotive will permit. On consolidation locomotives the depth of the throat sheet is limited, due to the frame passing under firebox and on account of rear driving wheel, which is located under firebox. On Atlantics, Mikados, Mallets and Pacific type a deeper throat sheet can be obtained, as it is not necessary for the frames to pass under the firebox. Your committee also suggests the design of throat sheet as shown on fig. 13, on boilers with sloping mud ring to allow for

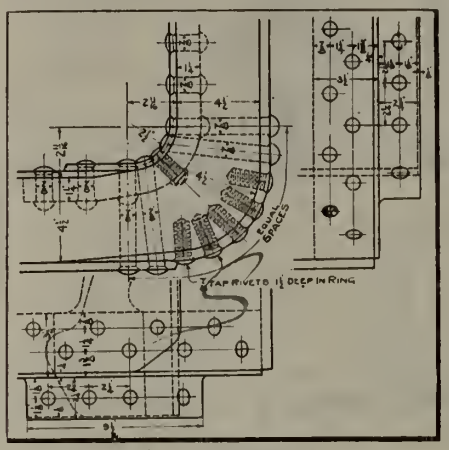


Fig. 12. Type of Mudring Corner.

more uniform spacing of stay bolts and location of arch tubes and simplifies the flanging of the throat sheet and flue sheet.

From the replies received in regard to thinning out of flue and door sheets, also the use of countersunk rivets where these sheets are joined to the side sheets, you will find the different methods followed out in fig. 14. About 50 % of the

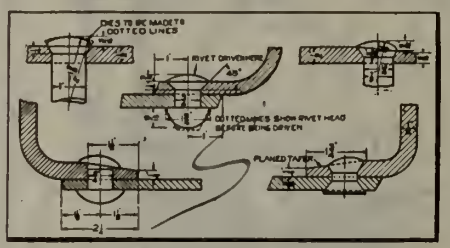


Fig. 14. Use of Countersunk Rivets at Juncture of Sheets.

members thin out these sheets and apply countersunk rivets. It is generally acknowledged that the thinning of the sheets and the countersinking of rivets is necessary on oil burning locomotives. The general practice seems to be to countersink these rivets about half way up the side sheets. No data were given in regard to which practice is the best from a maintenance standpoint.

with this type of fire door for a number of years. On boilers so equipped, they have had several cases where the door sheets have remained in perfect condition although two sets of side sheets and a second back-flue sheet had been applied and cracked badly. In every instance the door hole remained in practically perfect condition when the rest of the firebox was cracked to the point of renewal. Boilers equipped with this type of fire-door hole give larger water space, fewer staybolts about the door seam, seems to give freedom for expansion and contraction and also largely prevents mud and scale collecting at this point.

Six members favor style E, and eight members style D.

It seems to the committee that style A, would have a tendency to collect mud

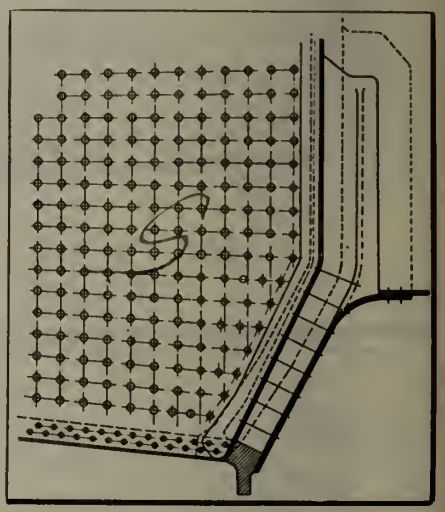


Fig. 13. Throat Sheet for Sloping Mudring.

and burn out. The committee has no choice between styles B. C. D. and E.

NUMBER AND SIZE OF FIRE Doors.—We find that various sizes and numbers of door holes are used on different types of boilers.

Canadian Freight Association, Western Lines.

At the annual meeting in Winnipeg, Aug. 1, the following officers and committees were elected:—

President, C. E. Dewey, General Freight Agent, G. T. Pacific Ry.; Vice President, W. C. Bowies, General Freight Agent, C.P.R.

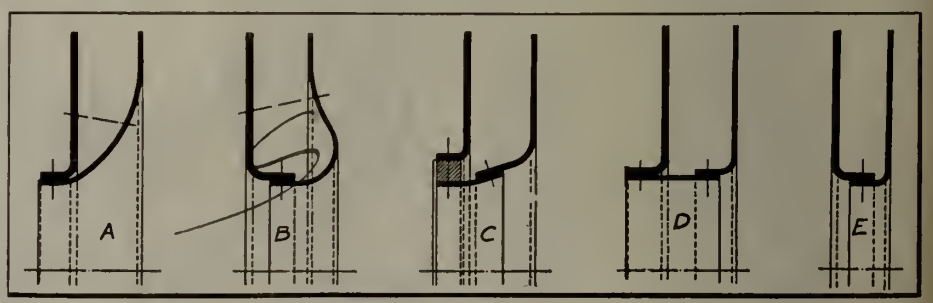


Fig. 15. Various Designs of Firedoor Holes.

SPACING OF RIVETS IN FIREBOX Seams.—Your committee suggests ¾ in. rivets spaced 2 ins apart, as this is used by the majority of the members who replied to the circular.

DESIGN OF FIRE-DOOR HOLE.—Fig. 15 shows various designs of fire-door holes used by different members. Three members advise that they use style A, which is the O'Connor type of fire door. One of the members reports that they have had 1,200 locomotives equipped

Executive Committee.—C. E. Dewey, W. C. Bowies, G. Stephen.

Car Service Committee.—A. Hatton, J. P. Driscoll, T. P. White, W. B. Harris.

Classification Committee.—W. B. Lanigan, G. Stephen, C. E. Dewey, W. G. Manders, R. J. Foreman, P. H. Burnham, W. C. Bowies.

Inspection Committee.—W. G. Manders, G. H. Smith, W. J. Hunter, P. H. Burnham.

The Present and Future Duties of General Air Brake Inspectors.

By B. J. Langan, General Air Brake Inspector, Delaware, Lackwanna and Western Rd.

The present duties of the general air brake inspector are to be thoroughly familiar with the conditions existing on his road, regarding motive power and equipment, grades, yard facilities, inspection and maintenance, train handling and instructions, and, in fact, on all subjects wherein the air brake is involved. As his duties require him to be on all divisions of the system, he is in a position that by careful observation, he can become invaluable to the road he represents, by suggestions to better the service, as the questions of rough handling and inspection are of vital importance in transportation matters.

Rough handling in yard terminals should attract his attention, especially in flat yards, as this is the originating point of breaking in two, and where damage to lading can be traced. It can be controlled in hump yards by a check system on each car rider who rides the car to its destination in the yard, but in flat yards, where "kicking" or shunting is resorted to, the damage is appalling, when we know it can be reduced. The general air brake inspector cannot get results, unless he rides on freight trains to get conditions as they exist, and see that instructions are being followed. He should be able to handle trains in any class of service and give practical demonstrations when called upon to do so. By this method he is in a position to state what is necessary to control trains in grade work and the air facilities required regarding pump and main reservoir capacity.

Let us first consider his present duties. He should check the brake equipment on locomotives, and reduce the different types to a standard, by having air pumps, engineers' brake valves, feed valves, pump governors and main reservoirs of one type, if possible, and by so doing, will reduce engine failures, carry less stock, reduce cost of repairs, and the locomotive engineers on whom we depend for results will be in a better position to follow instructions than they are where a variety of these parts is in use.

His next consideration should be the brake arrangement on freight cars. This, I consider of the utmost importance, as a great amount of efficiency and money is lost by improper foundation brake arrangement. The application of air brakes to all freight equipment makes it essential that maintenance is the paramount issue to get the full value for which they were applied, and increase the factor of safety. When a locomotive is built, it is given a tonnage rating, and this is not reduced at any time. When this locomotive cannot pull its tonnage, the necessary repairs are made and it represents 100% until sent to the shop for repairs. How near 100% are our freight brakes maintained?

Do we get over our equipment by the cleaning process yearly? How many packing leathers are applied monthly or yearly? What is the angle of brake hangers on our equipment? Is it such that we get uniform wear on the brake shoe? What is the length of brake beam? Do the shoes overlap? On this alone he can save his salary. Have we an easy method of adjustment of piston travel so that inspectors will not neglect this important part of their duties? Have we a card system, and is it being given proper attention? Have we proper air facilities in yards? Are our inspection forces properly organized? This requires personal supervision. Are we supplying the different inspection points with material to maintain your brakes? Do we visit the inspection points on the system to show the men that we are keeping in touch with the work? Do we call the attention of our superiors to the necessity of needed improvements at the different points, to properly maintain brakes?

Go into these questions thoroughly and it will surprise the most sceptical what an added improvement can be made. You may say our company will not spend the money. That is, because you have not shown that the damage can be reduced a greater amount than the cost of needed material. There are no officials, when shown that a saving can be made by a small expenditure, who will fail to take advantage of it and it is your duty to call their attention more than once to the importance of its necessity.

Give attention to qualification of firemen who are being promoted to engineers. They should have a general knowledge of brake mechanism, and on roads with grades of 1½% or greater, should be required to handle trains before final examination. This method has been followed by the writer, going with the men when occasion permits and the results are excellent. A newly promoted engineman without experience should be accompanied by the road foreman of engines or the general air brake inspector on his first trip, if possible. Instructions should be furnished him in pamphlet form for handling trains, or printed in the special rules on the back of time card. It is seldom that an engineer will carry his book of rules with him, but the time card must be always present. This is a great aid, and lessens the difficulty of train handling by old and young enginemen. We may have the brake equipment in perfect condition, but through lack of judgment or knowledge of proper manipulation on the part of the engineman, serious damage occurs, and our best efforts are in vain.

What does inspection mean? It is insurance against damage and a premium on safety. To the general yard master, a bone of contention. To the railway, one of its best assets. The word, as understood by the general air brake inspector, implies that when a train is inspected, defects have been located and repaired. How often, through the neglect of an inspector, do we find the cost of wrecks running into thousands of dollars, by failing to apply a cotter pin or split keys? Brake rigging down, caught switch point or frog, and in many cases this is due to yard masters hurrying the inspector. This condition should not exist. When the train is made up and the inspector puts on his blue flag, the amount of work to be done should govern the time to put the train in a safe condition before dispatching. If too long a time is required and congestion takes place, it shows clearly that not enough inspectors are employed, and it is the duty of the general air brake inspector to remedy it. Safety is the first consideration in all train movements, and can only be obtained by time and men to do the work.

This takes us to an important subject, and one in which the general air brake inspector should be thoroughly familiar, as it involves the questions of breaking in two, which are made prominent on account of detentions to trains of superior class, and damage to lading and equipment. The originating point of these breaks is in yard terminals, and any operating official can be convinced of this by remaining in a yard one day, flat yards, where cars are "kicked," being most conspicuous. When we consider that the draft gear in 90% of the cars in service will only absorb a shock of 40,000 to 60,000 lbs., and a loaded car kicked or shunted against a number of cars at a speed of 5 m.p.h. will develop 300,000 to 500,000 lbs., is it any wonder that railways are paying large sums each year as indemnity loss on lading, not speaking of the cost of repairs to equipment? So long as the car is not broken, this damage loss cannot be estimated or traced to any particular yard, but the necessity of proper instruction to switchmen by train and yard masters, and to switch engineers by road foremen of engines, would be a remedy properly applied. It is true, in yard movements, that the engineer must follow the signals of switchmen, but moderation on the part of both would give better results.

While I have stated that loaded cars at five miles an hour coming in contact with a train of such cars, will cause shocks of 300,000 to 500,000 lbs., what must it be at 10 or 12 miles an hour? It means that this condition will prevail to a great extent, and the necessity of a friction draft gear that will absorb 250,000 to 300,000 lbs. is the question, and it is the future duty of the general air brake inspector to keep before his superior officers.

The logical method of making up mixed trains has been to keep all loaded cars next to the locomotive, and all empty cars on the rear, but so much trouble has been experienced in keeping trains of this kind intact when brake applications were made, that tests have proven they can be handled successfully by deviating from this practice. Loads should not be placed indiscriminately throughout a train. I have in mind three cases of recent date, in one of which the consist was 55 empty cars, 17 loads, 15 empties. A hose burst on the head portion of the train, and the shock from the loads running in caused the train to buckle, throwing the empty cars immediately in front of the loads, on the opposite track. Another case of a train parting with loads in three separate places, and seven loads on the rear of a 75 car train caused a similar accident.

Tests which the writer conducted with a dynamometer car, show the necessity of changing the old method and prove, after a year's trial, that the make-up of mixed trains should be as follows: Ten empty cars next to the engine. All loads immediately behind the 10 empty cars, and the remaining empty cars on the rear. The number of empty cars on rear should be in excess of those on the head end. Regardless of the number of cars in such trains, the empty cars on front portion should not exceed 10, and this to avoid such accidents as quoted, to prevent buckling. On one division of the D.L. and W.R., where this practice has been followed, there is no complaint of breaking in two, and conductors and engineers will tell you it is the only way to handle them successfully.

Breaking in two occurs on trains of all loads and all empties, but when a condition exists where engineers are afraid to use the automatic brake, it should be remedied at once. Superintendents and yard masters may object on the ground that it requires too much switching—it requires not more than two switch movements, and a trial will convince that it is worth the effort. There is nothing in railway work that cannot be done when a question of safety is involved—the saving of equipment and probably loss of life must be considered.

With a train of 25 loads and 50 empty cars, there is eight times greater retarding force on the empties than on the loads. By transferring 10 empty cars next to the locomotive, this ratio is changed less than 2½%, as you have taken 20% from behind the loads and added it to that of the loads. In case of train parting by accident or other-

wise, the empties on rear will prevent the loads running in, and an emergency application can be made without bad results.

With a train of the first consist, 25 loads, 50 empties, running at 15 to 20 miles an hour, make a 12 lb. reduction, and when speed has been reduced to six or eight miles an hour, a jerk of 150,000 to 170,000 lbs. is registered and the train parts, as the knuckles will not stand more than 150,000 lbs. How much more this jerk would be, I am unable to state, as in all cases the train parted when this amount registered. As the draft gear would only absorb 40,000 to 60,000 lbs., you can realize that in a short time it has a telling effect on the equipment.

With a train of the second consist, 10 empties, 25 loads, 40 empties, the greatest shock did not exceed 40,000 lbs., first getting a buffing strain of 15,000 to 20,000 lbs., and as the slack adjusted itself in the train, no bad effects were felt, it being a gradual strain.

The breaking in two from other causes should be recorded by each division superintendent, showing name of engineer and cause, a monthly report of same to be made to the general air brake inspector, so that a remedy can be applied.

The general air brake inspector on any road cannot be of great value unless he has the co-operation of the transportation officials, and he is of great service to them in solving methods of dispatching trains with safety, lessening the account of damage and loss, and increasing regularity of train service. These are his future duties. He should not be confined to too much office work—his duties require him on the road, checking the work of inspectors in yards, to see that proper methods are used to facilitate in dispatching trains, and that the work is properly done.

I have not touched on the subject of passenger brakes, as I feel that the importance of this question is given such attention by all railway officials, and the freight brakes neglected, and that the question of future duties is in redeeming the freight brakes and getting as near 100% efficiency as possible.

1. With dynamometer car alone dropped at a speed of seven miles an hour over the hump and allowed to run into a cut of loaded steel hoppers, standing still, we got a buffing shock of considerably over 607,000 lbs. This being the limit of the dynamometer, we were unable to give the total amount of the blow. The dynamometer car weighs 51,000 lbs.

2. Two cars, the dynamometer car first, and a loaded class G1 car behind, were dropped over the hump at a speed of two miles an hour, into the cars, and showed a buffing shock of 207,000 lbs. This class G1 car weighed 130,000 lbs., making a total of 181,400 lbs. for the two cars.

3. With the same two cars as per the second test, with tests made in the same manner, but at a speed of 3 9-10 miles per hour, the buffing shock was 420,000 lbs.

4. We placed a loaded class G1 car, weighing 141,400 lbs., part way down the hump, or at the point at which usually stopped by car droppers until other cars are weighed and dropped against it when going to the same classification track. Then same two cars as used in tests 2 and 3, or dynamometer car and a class G1 car next, with total weight of 181,400 lbs., were dropped at a speed of four miles an hour against the car standing on the hump the same as in actual practice, and the buffing shock was 445,000 lbs.

For the purpose of determining the magnitude of the blow when one car runs into another, we made four tests in one of our hump yards.

Orders by Board of Railway Commissioners.

Beginning with June, 1904, we have published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed our paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates given of orders, immediately following the numbers, are those on which the hearings took place, and not those on which the orders were issued. In many cases orders are not issued for a considerable time after the dates assigned to them.

16966. July 9.—Dismissing city of Ottawa's application re express delivery limits.

16967. July 6.—Authorizing G.T.R. to build siding for Carroll Bros., Humberstone tp., Ont.

16968, 16969. July 10, 11.—Authorizing G.T.R. to use interlocking plant at drawbridges built over St. Lawrence river and Soulanges canal; and to raise bridge 7 across Grand River on its Holmedale branch by one foot.

16970. July 6.—Authorizing G.T. Pacific Ry. to cross highway at mileage 28.3 North Alberta District.

16971. July 6.—Approving C.N. Ontario Ry. station grounds at Kilfoyle, Montague tp., Ont.

16972, 16973. June 28, July 9.—Authorizing C.N. Ontario Ry. to cross public road between cons. 2 and 3, Whitby East tp., Ont.; and to cross Montreal Park and Island Ry. at Sault au Recollet, Que., room to be left for second track.

16974, 16975. July 10.—Authorizing C.N. Quebec Ry. to extend siding on Prince Albert Ave., Tetreaultville, Montreal, crossing Laurier and Azilo Sts., and to build spur for American Canning Co., Maisonneuve.

16976 to 16978. July 11, 6, 11.—Approving location of Camnbellford, Lake Ontario and Western Ry. (C.P.R.), mileage 177.3 to 183.51, from King St. West, Port Hope, to mileage 127.32; and authorizing it to build across Oshawa Electric Ry. at mileage 158.85, interlocking plant to be installed.

16979. July 6.—Authorizing C.P.R. to build its Harrowby ballast pit spur across four highways in Manitoba.

16980. July 8.—Rescinding order 16517, May 11, re C.P.R. spur at Blind River, Ont.

16981, 16982. July 9, 4.—Authorizing C.P.R. to build spur for Crushed Stone and Gravel Ltd., on s.e. ¼ sec. 34, tp. 35, r. 14, w. 3 m., and to build transfer track to connect with Midland Ry. of Manitoba, in lots 44 and 45 outer 2 miles, St. James parish, Winnipeg.

16983 to 16985. July 10, 9.—Authorizing C.P.R. to build bridge 103.3, Sudbury subdivision and rebuild bridge 91.5, Toronto subdivision, and approving plans for bridge 112.2, Cascade subdivision, B.C.

16986. July 8.—Authorizing C.P.R. to revise main line in Woodstock, Ont., subway to be built at Dundas St., 20% of cost to be paid from railway grade crossing fund.

16987. July 12.—Ordering G.T. Pacific Ry. to build station on lot 882, group 1, Cassiar District, B.C., with leave to apply for approval of station site that will give adequate facilities to Hazelton, and rescinding order 16891, June 25, in same connection.

16988. July 2.—Ordering G.T.R. to install two electric bells at Elgin and Elizabeth Sts., St. Marys, Ont., 20% to be paid from railway grade crossing fund.

16989. July 13.—Amending order 16912, June 28, re taking of G.T.R. lands by Campbellford, Lake Ontario and Western Ry., (C.P.R.) by providing that if parties do not agree as to compensation for land taken within 30 days, same shall be fixed by one of the Board's engineers.

16990. July 8.—Authorizing C.P.R. to build subway at Syndicate Ave., Fort William, Ont.

16991, 16992. July 13.—Authorizing C.P.R. to build additional track across Rogers St., Victoria Drive and Salisbury Drive, Vancouver, B.C.

16993. July 13.—Dismissing C.P.R. application re rehearing of station case at St. Francois de Salles, Que.

16994. July 13.—Authorizing C.P.R. to build main line and additional track across Wall St., Hastings, Vancouver, B.C.

16995. July 13.—Dismissing application of F. Gravel, Chateau Richer, Que., with leave to renew, re farm crossing on Quebec Ry., Light, Heat and Power Co.'s line.

16996. July 12.—Approving plan of G.T.R. cross-over switch east end of Cardinal yard, Ont.

16997. July 11.—Authorizing G.T. Pacific Branch Lines Co., to build industrial spur in Yorkton, Sask.

16998 to 17001. July 8 to 15.—Authorizing C.P.R. to build spurs near Longue Pointe, Que., and certifying correction; for Saskatoon Public School District Board, Saskatoon, Sask.; Ogilvie Flour Mills Co., Fort William, Ont., and McGregor and McIntyre, lot 28, con. 2, from bay, York tp., Ont.

17002. July 8.—Authorizing Camphellford, Lake Ontario and Western Ry., (C.P.R.), to connect at mileage 183.51 from Glen Tay with Ontario and Quebec Ry. (C.P.R.), at mileage 87.41 west from Havelock, Ont.

17003. July 13.—Authorizing G. Mailloux to build farm crossing across G.T.R. near milepost 23½ from Windsor, Ont.

17004. July 13.—Ordering G.T.R. to instal gates within 60 days at crossing of Main street, Victoriaville, Que.

17005. July 13.—Approving change in C.P.R. station building at St. Augustin, Que.

17006. July 8.—Authorizing C.N. Ontario Ry. to build across public road in Ste. Genevieve parish, Que.

17007. July 13.—Authorizing Empire Limestone Co., to build tunnel under Carroll Bros.' siding in lot 5, con. 1, Humberstone tp. Ont.

17008 to 17011. July 8.—Approving C.N. Ontario Ry. revised location through Boulter, Lauder, Pentland, Master, Stratton and Barron tps., Nipissing District; authorizing it to cross public road between lots 5 and 6, Ross tp., and approving revised location in Beaucage tp. Nipissing District, Ont.

17012. July 13.—Authorizing Camphellford, Lake Ontario and Western Ry. (C.P.R.), to change its line and cross Bay of Quinte Ry. at mileage 43.86, in Camden tp., Ont.

17013. July 15.—Approving changes in location of C.P.R. station at North Wakefield, Que.

17014 to 17016. July 16.—Authorizing C. N. Ontario Ry. to cross public roads in Bristol tp., Que., and Westmeath and Torbolton tps., Ont.

17017. July 16.—Authorizing G.T.R. to build spur for J. Duff and Son, Hamilton, Ont.

17018 to 17020. July 16.—Approving revised location of G.T. Pacific Branch Lines Co., Cutknife branch, mileage 26.26 to 38.74, Sask., and authorizing it to build spur for McLeod Collieries, Ltd., from its Alberta Coal Branch, and to build spur for Jasper Park Collieries, North Alberta District.

17021. July 16.—Approving Montreal and Southern Counties Ry. location from Ranelagh to boundary between Longueuil and Laprairie parishes, Que., 4,500 ft.

17022. July 13.—Ordering C.P.R. within 90 days to install electric bell at Queen St., Woodstock, N.B., 20% to be paid from railway grade crossing fund.

17023. July 16.—Ordering Temiscouata Ry. within 30 days to remove cattle guard and earth at crossing of Grand Falls road, under penalty of $25 a day.

17024. 17025. July 15.—Approving revised location Campbellford, Lake Ontario and Western Ry., mileage 155.13 to 157, from Glen Tay, approving location through Whitby, Ont. and authorizing crossing of main line two additional tracks in con. 1, East Whitby tp. Ont.

17026 to 17028. July 16.—Authorizing C.P.R. to build spurs for Fitzsimmons Fruit Co., Port Arthur, Ont., Crows Nest Pass Lumber Co., Calgary, Alta., and Rocky Mountain Cement Co., Blairmore, Alta.

17029. 17030. July 15, 16.—Approving C.P.R. plans for span at easthound hump in new yard, East Winnipeg, Man., and bridge 131.3 Brandon subdivision.

17031. July 18.—Authorizing G.T.R. and C.P.R. to operate over interlocker west of Fergus, Ont., without stopping.

17032. July 15.—Authorizing G.T.R. to build three bridges carrying highways, Louth tp., Ont.

17033, 17034. July 18.—Ordering that work be commenced forthwith on separation of grades, Toronto, and completed by Sept. 1, 1914, under penalty of $100 a day, and approving G.T.R. plan for new union station, Toronto, same to be commenced forthwith and completed not later than Sept. 1, 1914, under penalty of $100 a day. These orders were given in full in Canadian Railway and Marine World, Aug., pg. 401.

17035. July 17.—Authorizing G.T. Pacific Branch Lines Co. to build its Prince Albert Branch across highway at mileage 101.5.

17036. July 11.—Reserving for further consideration, approval of location of Campbellford, Lake Ontario and Western Ry. (C.P.R.), mileage 121 to 124.83 and authorizing it to take lands of G.T.R. and C.N.O.R.

17037 to 17041. July 16.—Approving C. N. Ontario Ry. revised location through Westmeath, tp.; through unsurveyed territory in Algoma and Sudbury Districts, and authorizing it to build across Wanapitei river, Street tp.

17042. July 16.—Authorizing Canadian Northern Ry. to cross 14 highways with its Alsask southeasterly line.

17043. July 15.—Authorizing C.N. Ontario Ry. to connect with Malleable Castings Co.'s siding in Smiths Falls, Ont., and to cross four streets.

17044. July 16.—Authorizing C.N. Quebec Ry. to cross seven highways in Two Mountains and Terrebonne counties.

17045. July 17.—Authorizing C.N. Ontario Ry. to construct across Nichols Creek, Marlborough tp., Ont.

17046 to 17048. July 17.—Approving Canadian Northern Ry. revised location, mileage 206.95 in Saskatchewan to 280.62 in Alberta.

17049. July 17.—Authorizing C.N. Ontario Ry. to build across two highways in Bristol tp., Que.

17050. July 17.—Authorizing Canadian Northern Ry. to build its Alsask Southeasterly line across 10 highways.

17051. July 17.—Approving revised location of Algoma Central and Hudson Bay Ry. between mileage 82.38 and 123.53 northerly from Hobon, Ont.

17052. July 17.—Relieving Vancouver, Victoria and Eastern Ry. (G.N.R.) from erecting and maintaining fences on portion of its line between Keremeos and Princeton, B.C.

17053. July 17.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.), to cross highways from mileage 128.09 to 131.23 Hope, tp., Ont.

17054. July 17.—Authorizing Atlantic, Quebec and Western Ry. to open for traffic its line between Grand River station, mileage 51½ and Gaspe station, mileage 102½, Que.

17055. July 17.—Naming express delivery and collection limits for Estevan, Sask.

17056. July 16.—Authorizing C.P.R. to build spur for Saskatoon Tent and Mattress Co,, Saskatoon, Sask.

17057. July 17.—Authorizing Canadian Northern Ry. to cross nine highways on its Alsask Southeasterly line.

17058. July 17.—Authorizing James Bay and Eastern Ry. (C.N.R.) to build bridge across Salmon River, mileage 22.1.

17059. July 17.—Authorizing Vancouver-Victoria and Eastern Ry. (G.N.R.), to open for traffic its line from Abbotsford to Kilgard, B.C.

17060. July 17.—Authorizing C.P.R. to build spur for Winnipeg Supply Co., Winnipeg.

17061. July 19.—Authorizing C.P.R. to revise grade of main line and build additional main line track from mileage 17.35, Farnham subdivision to Iberville Jct., thence to mileage 41.8 Highlands, Que.

17062. July 18.—Authorizing C.P.R. to build spur for Roofer's Supply Co., Toronto.

17063. July 18.—Authorizing C.N. Quebec Ry. to cross public road in St. Eustache parish.

17064. July 5. Re interswitching by G.T.R. in Galt, Preston, Hespeler, Berlin and Waterloo, Ont. This order is given in full on another page.

17065. July 15.—Authorizing C.N. Ontario Ry. to cross Jacques Cartier and Union Ry. (G.T.R.), near Jacques Cartier Jct., Que., interlocker to be installed.

17066. July 20.—Apportioning cost of work, etc., re C.N.R. and G.T.P.R. spur for Tuxedo Park Co., Winnipeg, Man.

17067. July 17.—Authorizing Canadian Northern Ry. to cross public road on its Alsask Southeasterly line.

17068. July 19.—Authorizing G.T.R. to build certain bridges on its Holmedale branch, Brantford, Ont.

17069. July 19.—Ordering G.T.R. to file within 15 days, plan of location of station proposed at level crossing of Quebec, Montreal, and Southern Ry., at St. Gregoire; that St. Gregoire be established as regulation station with telegraph communication between Doucets Landing and Victoriaville; and that Q.M. and S.R build platform for transfer of passengers.

17070, 17071. July 15.—Approving proposed change of C.P.R. station at Bredenbury, Sask., and change in location of C.P.R. station at Merritt, B.C.

17072. July 20.—Ordering C.P.R. to maintain permanent watchman, day and night, at crossing at mileage 101.6 Boundary subdivision, near Fisherman, B.C.

17073. July 19.—Authorizing Toronto Eastern Ry. to cross public road on con. 2, between Pickering and Whitby tps.

17074. July 19.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.), to build bridges 180.2 and 180.13, at Little Rouge and Big Rouge Rivers, Ont.

17075. July 19.—Authorizing C.P.R. to build spur for Provincial Reformatory, lot 3, con. 1, Guelph tp., Ont.

17076, 17077. July 19.—Approving C.P.R. proposed shortening of track circuit in connection with crossing bells at Argyle St., Renfrew, Ont., and interlocking and signal device to be used in operating over the Lachine canal.

17078. July 19.—Authorizing C.N. Ontario Ry. to cross public road between cons. 16 and 17, Ferris tp.

17079. July 19.—Approving C.N. Ontario Ry. station grounds at Smiths Falls, subject to agreement of June 3, 1911, with the town.

17080. July 20.—Authorizing C.N. Ontario Ry. to cross G.T.R. near Davenport Road, Toronto, question of taking of lands left to Chief Engineer of Board.

17081. July 20.—Ordering G.T. Pacific Ry. to repair approaches to crossing on D. McKenzie's property, Kirk, Alta., within 30 days under penalty of $25 a day.

17082. July 20.—Authorizing Lachine, Jacques Cartier and Maisonneuve Ry. (G.T.R.), to take lands 597 ft. by 100 ft. wide, of Montreal Park and Island Ry. in St. Laurent parish, Montreal.

17083, 17084. July 22.—Approving C.P.R. plans for steel trestle of bridge 26.8, Suffield-Kipp subdivision, and authorizing it to rebuild bridge 109.4, Muskoka subdivision.

17085. July 22.—Authorizing G.T.R. to build spur for New Burford Canning Co. Brant county, Ont.

17086. July 22.—Approving G.T. Pacific Branch Lines Co.'s proposed station and site at Edwin, Sask.

17087. July 20.—Ordering Dominion Atlantic Ry. to install gates at Gerrish St., Windsor, N.S., 20% to be paid from railway grade crossing fund.

17088. July 23.—Dismissing application of Board of Trade, Pelly, Sask., re delay to shipments of freight by Canadian Northern Ry.

17089. July 22.—Ordering C.N.R. within 10 days to file plan for station at Fort Frances, Ont.

17090. July 22.—Authorizing Toronto Suburban Ry. to cross under C.P.R. in Vaughan tp., Ont.

17091. July 22.—Authorizing C.N. Ontario Ry. to build across Wistiwasing river, Chisholm tp.

17092. July 22.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.), to cross G.T.R. at mileage 163.46 from Glen Tay, Interlocker to be installed.

17093. July 22.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.), to build bridge 170.57 over Duffins Creek, Ont.

17094. July 22.—Approving location of Georgian Bay and Seaboard Ry. (C.P.R.), station on lot 18, con. 9, Cartwright tp. Ont.

17095. July 23.—Approving Campbellford, Lake Ontario and Western Ry. (C.P.R.), revised location from mileage 63.59 to 68.50 and from mileage 70.25 to 72.44.

17096. July 23.—Authorizing C.P.R. to build bridge over Wyandotte St., Windsor, Ont.

17097. July 22.—Authorizing C.P.R. to build spur for Twohy Bros., on its Thompson subdivision, near Kamloops, B.C.

17098. July 23.—Authorizing C.P.R. to build spur across Avenue E. for Western Foundry and Machine Co., on lots 9 and 31, and lane between, Saskatoon, Sask., and rescinding order 16581, May 23 in same connection.

17099. July 22.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.), to build across highways from mileage 141.26 to 154.3, Durham county, Ont.

17100. July 23.—Authorizing Canadian Northern Ry. to build across certain highways on its Strathcona-Calgary extension, Alta.

17101. July 23.—Approving of the location of the Canadian Northern Montreal Tunnel and Terminal Co. station and track layout, Montreal.

17102. July 23.—Authorizing Central Ry. of Canada to build across certain highways near McAlpine, Ont.

17103. July 23.—Approving Kettle Valley Ry. location, between mileage 40 and 57.4, west of Hydraulic Summit, B.C.

17104. July 23.—Authorizing C.P.R. to open for traffic portion of its second track, mileage 114.54 to 119.06, Kenora subdivision.

17105. July 22.—Approving location of Campbellford, Lake Ontario and Western Ry. (C.P.R.), from milage 160.86 to 161; 165 to 174, and 176 to 177.30, all from Glen Tay, Ont.

17106. July 22.—Authorizing C.P.R. to build additional track across public road at lot 30, con. 7, Spencerville, Ont.

17107. July 22.—Authorizing Michigan Central Rd. to build spur for Shredded Wheat Co., Niagara Falls, Ont.

17108. July 25.—Approving location of Erie, London and Tillsonburg Ry., from mileage 1, near Port Burwell, mileage 13.6 at Aylmer, Ont.

17109. July 24.—Authorizing C.P.R. to rebuild bridge 100.6, Sherbrooke subdivision, Que.

17110. July 25.—Authorizing C.P.R. to build two private crossings opposite Granville St., and opposite Burrard St., Vancouver, B.C.

17111. July 24.—Authorizing C.P.R. to build two additional sidings on lots 10 and 11, con. 1; and across Glasgow St., London, tp.

17112. July 24.—Authorizing G.T.R. to rebuild bridges 203 at mileage 151.05 20th district, Northern Division, and 49, at mileage 95.80, 15th District, Middle Division.

17113. July 23.—Authorizing Canadian Northern Montreal Tunnel and Terminal Co. to cross C.P.R. by carrying same overhead, Montreal, and to cross C.P.R. near Outremont Yard, Montreal.

17114 to 17116. July 23, 25.—Authorizing C.P.R. to build spurs for McGillivray Coal and Coke Co., Coleman, Alta.; Buell & Co., Cochrane, Alta., and two spurs for Alberta Ice Co., Keith, Alta.

17117. July 23.—Authorizing C.P.R. to cross public road between sec. 31-51-24 and sec. 6-52-24, w. 4 m., on its Strathcona-Calgary extension, Alta.

17118. July 24.—Authorizing C.N. Ontario Ry. to cross public road between lots 30 and 31, con. 1, Nepean tp.

17119. July 22.—Ordering that stop over privileges granted to British Canadian Canners, Ltd., by railways operating from the Peninsula westward, in Ontario, be granted them at two points east of Toronto, viz., Bowmanville and Cobourg.

17120. July 19.—Approving and authorizing G.T. Pacific Branch Lines Co. station grounds on Tofield-Calgary branch between tps. 42.21 and 41-21, w. 4 m.

17121. July 27.—Authorizing C.N. Ontario Ry. to cross public road between lots 84 and 85, Ste. Dorothee parish, Que.

17122. July 29.—Dismissing application of C.P.R. for authority to build its Asquith to Conquest branch, across G.T. Pacific Ry. in sec. 20-26-6, w. 3 m., Sask.

17123. July 30.—Dismissing application of town of Forward, Sask., to order C.P.R. to furnish station, telegraph service, etc.

17124. July 24.—Approving G.T. Pacific Branch Lines Co., station and site at Dinant, Alta.

17125. July 29.—Dismissing application of C. M. Kelly, Edmonton, Alta., in relation to the diversion of Fort Saskatchewan Trail, and crossing of G.T. Pacific Ry. over same.

17126. July 29.—Dismissing G.T. Pacific Ry. application for leave to appeal to the Supreme Court from order 16700, authorizing crossing of the G.T.P. Ry. at Spruce St., Edmonton, Alta.

17127. July 29.—Dismissing petition of residents of Resplendent, B.C., alleging that supplies carried on G.T. Pacific Ry. in that district for contractors' use have been sold in competition to private dealers.

17128. July 29.—Authorizing C.P.R. to remove spur connecting lot 23, part of block 1, lot 1, St. John parish, Winnipeg.

17129. July 29.—Ordering Canadian Northern Ry., on or before Sept. 1, to build farm crossing on A. Meunier's farm on s.e. ¼ sec. 16-24 w. 4 m., Alta.

17130. July 29.—Ordering G. T. Pacific Ry. on or before Sept. 1, to survey and convey to city of Edmonton, Alta., a lane 20 ft. wide in lieu of lane blocked by company's construction.

17131. July 29.—Ordering Canadian Northern Ry. to fence portion of its right of way from Saskatoon to northern limits of rural municipality 344, to be completed on or before Nov. 1,

17132. July 29.—Ordering Hamilton Radial Ry. to make gravel crossings at suitable point for accommodation of each house on its track south of canal, Burlington Beach, Ont., wherever such a crossing does not already exist, within 30 days.

17133 to 17136. July 30.—Approving agreements between Bell Telephone Co., and East Middlesex Telephone Co., Byron Telephone Co., North Colchester tp., and Brook tp., Ont. for interchange of service.

17137. July 31.—Approving of location of Edmonton, Dunvegan and British Columbia Ry., mileage 29.783 to 68.30 and authorizing it to cross highways.

17138. July 31.—Approving agreement between Bell Telephone Co., and Rochester tp., Ont., for interchange of service.

17139. July 26.—Approving proposed change in location of C.P.R. station building at St. Hermanas, Que.

17140. July 30.—Authorizing Canadian Northern Montreal Tunnel and Terminal Co. to cross Cote de Liesse Road, St. Laurent parish, Que.

17141. July 26.—Approving G.T. Pacific Ry. revision of grade at Tete Jaune Cache, between mileage 179 and 180, Wolf Creek, west, B.C.

17142. July 26.—Authorizing G.T.R. to build spur for A. Knibb and Son, on lot 3, con. 3, Machar tp., Ont.

17143. July 25.—Authorizing G.T. Pacific Branch Lines Co., to operate trains over crossing of its Melville-Regina branch with Canadian Northern Ry. Prince Albert branch, at Regina, without stopping.

17144. July 25.—Authorizing G.T. Pacific Branch Lines Co., to cross and divert highways at mileage 108.9 and 109.2 in sec. 24-48-26, w. 2 m., Sask.

17145 to 17147. July 31.—Approving agreements between Bell Telephone Co., and Osprey, tps.; and West Tilbury tp., Ont., and Nelson Telephone Co., for interchange of service.

17148. July 26.—Authorizing C. N. Ontario Ry. to cross township road at station 3167.84 and to divert highway between mileage 268.68 and 269.23, Crerar tp.

17149. July 25.—Authorizing Edmonton, Dunvegan and British Columbia Ry. to cross

Canadian Northern Ry. at grade in sec. 35-55-25, w. 4 m., just south of Morinville, Alta., interlocking plant to be installed.

17150. Aug. 1.—Authorizing C.N. Ontario Ry. to cross Levase river and C.P.R. at mileage 224.2 from Ottawa.

17151. July 31.—Authorizing C.N. Ontario Ry. to build spur for Central Ry. of Canada, at McAlpine station, Ont.

17152. July 31.—Authorizing C.P.R. to build bridge over Thames river at Ingersoll, Ont., to carry siding for Stone Fertilizer Co.

17153. July 31.—Authorizing Canadian Northern Ry. to build spur through block 3, Hudson's Bay Reserve, Edmonton, to serve lots 164-168 and 209-211, and to cross Athabasca Ave.

17154. July 31.—Authorizing C.N. Ontario Ry. to cross public road between lots 6 and 7, con. 1, Gibbons tp.,

Grand Trunk Railway Betterments, Construction, Etc.

Central Vermont Ry.—The Public Service Commission of Vermont has approved of the company's plans for a new union station with the Rutland Rd., at Burlington, Vt., and other improvements, in preference to those submitted by the latter company. The C.V.R. plans provide for the separation of grades and for track elevation.

Quebec Freight Sheds, Etc.—Application was made to the Quebec Harbor Commission, Aug. 8, by the company for space to enable it to build new freight sheds in place of the present premises by the riverside. The Commissioners are negotiating with the city council with a view of acquiring certain areas, so as to be able to grant the company all the land between St. Andrew and St. James St., south of Prince of Wales St.

St. Lambert Yards, Etc.—Montreal press reports, Aug. 14, state that preparations are being made for the immediate erection of a 40 stall locomotive house on the south shore, about 1.5 miles from St. Lambert station.

We are officially advised that a contract has been let to the John S. Metcalf Co., Montreal, for the erection of a 27-stall locomotive house, together with turntable pit, machine shop, water supply system and accessories. The locomotive house will be of concrete and brick construction with wooden posts and roof.

Prescott, Ont.—An agreement has been signed under which the G.T.R. will within two years lay out large yards and build thereon a locomotive house and other terminal facilities, at a cost of $150,000, in consideration of a fixed assessment of $16,000 a year, and the building of a subway by the town. The laying out of these terminal buildings will necessitate the closing of those at Brockville, and it was stated in Montreal, Aug. 7, that the object in view is the equalizing of the divisions. The distance from Montreal to Brockville is 125 miles, and from Brockville to Belleville 95 miles, while Prescott is almost equidistant from Montreal and Belleville.

We are officially advised that the work to be done at Prescott will consist of the laying out of a terminal yard, with roundhouse, and the other necessary buildings and facilities.

South Parkdale Station.—The Toronto city council is selling 13,344 sq. ft. of land at Sunnyside for the erection of a station to take the place of the old one known as North Parkdale. H. R. Safford, Chief Engineer, is reported as stating that the plans for the new station have been approved, that work on it will be started at once, and that it will be completed this year.

Port Burwell to London.—There is every indication that the charter of the Erie, London and Tillsonburg Ry. has been acquired from J. H. Teall by the G.T.R. The notices calling a meeting of shareholders for Sept. 9, at Tillsonburg, Ont., is signed "Frank Scott" instead of "J. H. Teall" as formerly. Mr. Scott is Treasurer of the G.T.R.

Approval of the plans for the line from Port Burwell to Aylmer is being asked. Construction is to be gone on with this year, according to a statement made by Mayor Graham, of London, Ont., who added that the G.T.R. is desirous of obtaining a lease of the London and Port Stanley Ry. E. J. Chamberlin, President G.T.R., while in London, Aug. 8, advised the mayor to abandon the idea of electrifying that line, and to lease it to a steam road. It is reported locally that if an agreement to lease the line to the G.T.R. can be arrived at, the line from Port Burwell will be extended from Aylmer to St. Thomas and connected there with the L. and P. S. Ry. (Aug., pg. 415. See Erie, London and Tillsonburg Ry.)

The Fraser River Bridge.

The British Columbia Government's bridge over the Fraser River at New Westminster, an illustration of which is given on this page, and which cost about $1,000,000, is a very interesting structure. It is 11,985 ft. long including approaches, and is double decked, the lower road being utilized for railways, and the upper for pedestrian and vehicular traffic. It is built on 17 piers, 11 pedestals and 3 abutments, with a centre span opening for the passage of vessels; the pivot pier of the swing span is carried 90 ft. into the river bed; the deepest pier is 141 ft. below high water mark—made up of 69 ft. below the bed of the Fraser and a volume of water 72 ft. in depth. The power for opening the swing bridge is supplied by the B.C. Electric Ry. Co. The lower part of the bridge is being used by the Great Northern Ry. and by the B.C. Electric Ry. Co. on an annual rental basis. The transmission lines for supplying power for the operation of the B.C. Electric Ry.'s Fraser Valley branch are carried over the bridge on towers at a helght of 165 ft. above high water.

The British Columbia Government Bridge over the Fraser River.

The Consolidated Engineering Co., Ltd., has been incorporated under the Dominion Companies Act, with $100,000 capital, and office at Montreal, to carry on a general railway and other construction business. The incorporators are: S. G. Dixon, J. M. Montle, R. E. Allan, V. and C. T. Jette, Montreal.

Notes on Locomotive Building.

By H. H. Vaughan, Assistant to the Vice President, Canadian Pacific Ry.

While, no doubt, men engaged in operating railway shops are entirely competent to construct new locomotives, there is no question that to do so economically would necessitate a more extensive and systematic supervision than is necessary for straight repair work. No doubt the system thus involved would be a good thing for the shop, but at the same time it is not economical unless the work is sufficient to justify its being occupied.

The tools used in locomotive building can, no doubt, be advantageously employed in repair work, except in the case of special tools which cannot be sufficiently employed in repair work to justify their installation, but could be used to a sufficient extent in building locomotives to expect them to assist in reducing the cost of the locomotive repair output. All the machine tools employed in locomotive building are in addition to those used for turning out a given number of repairs and must be regarded as an additional investment.

The size of shop necessary to accommodate these tools, blacksmith shop, foundry, and other equipment required to construct new locomotives is all, practically speaking, in addition to that required for a repair output. It is therefore entirely unreasonable for a road to consider that because it can turn out locomotives at a cost less than it can obtain them from the builders that it can neglect the additional investment. There are many cases where locomotives have been turned out without adding anything like a sufficient amount to the actual cost of material and applied labor to cover the necessary expenses in connection with the operation of the plant, to say nothing of the interest and depreciation on the investment involved. Such items as repairs to tools and machinery, maintenance of buildings, supervision, drawing office expenses and a number of charges which have to be taken care of by every concern, are ignored in the case of railways building their own locomotives.

I do not believe there is a railway shop

in the country which constructs a new locomotive with as low a net c t of labor as any of the large building concerns do. It is true that even if expenses are evenly pro-rated, they may show a saving which is part of the profit obtained by the locomotive builder. This profit is, however, expended by the builder in keeping his plant up to date or spending dividends on the moneys invested in his plants so that when all is said and done the saving on the part of the railway company is comparatively small if looked at from a broad point of view.

I do not see why standards cannot be just as well obtained when locomotives are purchased as when they are constructed by a road itself. The question of design is not affected by purchasing or building, but when locomotives are arranged for without regard to maintaining a standard class of power, it is therefore no wonder that some roads get so many diversities of equipment. The standardization obtained in England is not so much on account of a road building its own locomotives, but on account of the large amount of responsibility placed on the locomotive department in the designing of its power and the permanence of the locomotive policy on the roads, not disturbed with each new general manager, but allowed to take its course and progress in a systematic way. There are some American roads which have followed similar methods and they have obtained standardization.—Railway Master Mechanic.

Operation of the N.T.R. Superior Junction-Winnipeg Section.

The question of the taking over of the Superior Jct.-Winnipeg section of the National Transcontinental Ry. has been under discussion for some time. At present the line is being operated by the Grand Trunk Pacific Ry. under a special agreement with the Dominion Government, which the company wants renewed. An order-in-council was signed July 27 in which it is recited that the portion of the railway comprising the section for which J. D. McArthur had the contract, and 11 miles of the O'Brien McDougall contract, and extending from Transcona to Superior Jct., "being now completed to the satisfaction of the Commissioners, the Minister recommends that in the event of the G. T. Pacific Ry. not exercising within 30 days from Aug. 12, 1912, its right to take a lease of said portion of the railway under the provision of clause 3 of the statutory agreement of Feb. 18, 1904, the Commissioners be authorized to make such arrangements as they may think best for the further operation of the said portion."

An official statement was made Aug. 7, by E. J. Chamberlin, president G. T. P. Ry., in which he said: "The G.T.P. Ry. has been operating that piece of line since Aug. 1, 1911, handling all of last season's grain business and other traffic offered over that line without any detriment to the public. The Government is now asking that the G.T.P. Ry. execute a permanent lease of that portion of the line between Winnipeg and Lake Superior Jct., known as district F and negotiations are pending between the government and the company on that point, but do not, so far as a matter of accommodation, in any way affect the public. The contract between the government and the G.T.P. Ry. relative to the National Transcontinental Ry., that section between Moncton and Winnipeg, which was to be constructed by the government and is known as the eastern division, provides that:—

"'Pending the completion of the eastern division by the Government the company shall be entitled to lease from the Commissioners to be appointed under the said act, and to operate such portions of the eastern division as may from time to time be completed, upon such terms, etc., but does not bind the railway company to take over any sections unless they desire to do so, until the entire line is completed.

"Negotiations are in progress between the Government and the company relative to a further lease of the section above referred to when it is fully completed and pending the completion of the whole line. Notwithstanding reports in the papers throughout the country, that portion of the Transcontinental line is not yet completed. There is considerable work to be performed on the entrance into Winnipeg, connecting up the Transcontinental with the G.T.P. Ry. and the Canadian Northern at the union station. There is also considerable other work on the line necessary to be done before the terms of the contract are complied with.

"With regard to the Springfield, or Transcona shops, Chairman Leonard, of the Transcontinental Railway Commission, has decided that the shops are not part of the contract between the Government and the railway, while the company contends that they are part of the Transcontinental contract. If Mr. Leonard's contention is eventually sustained, the taking over of the line between Winnipeg and Lake Superior Jct. would not include the taking over of the shops by the G.T.P. Ry. On the other hand, if the G.T.P. Ry.'s contention that the shops are a part of the Transcontinental Railway is sustained, the taking over of the line would also mean the taking over of the shops and placing them promptly in operation."

Canadian Northern Railway Earnings, Etc.

Gross earnings, working expenses, net profits, increases or decreases, compared with those for 1910-11, from July 1, 1911:—

	Earnings.	Expenses.	Net Earnings.	Net Increase
July	$1,475,900	$1,114,300	$361,600	$13,400
Aug.	1,420,600	1,105,900	314,700	51,700
Sept.	1,576,400	1,157,000	419,400	38,200
Oct.	2,028,900	1,348,500	680,400	99,900
Nov.	2,001,500	1,336,300	665,200	106,300
Dec.	1,831,400	1,327,600	503,800	144,600
Jan.	1,223,100	1,004,400	223,706	122,000
Feb.	1,203,400	965,800	237,600	101,800
Mar.	1,572,700	1,145,900	426,×00	72,000
Apr.	1,608,100	1,205,000	403,100	42,000
May	1,822,100	1,364,000	458,100	54,900
June	1,769,500	1,347,800	421,700	103,500
	$19,538,600	$14,422,500	$5,116,100	$950,300
Inc.	$4,399,100	$ 3,388,800	$ 950,300	....

Average mileage in operation during 1911-1912, 3,888 miles, against 3,385 miles during 1910-11.

Approximate gross earnings for July, $1,829,700, against $1,475,900 for June, 1911.

Canadian Pacific Railway Earnings, Etc

Gross earnings, working expenses, net profits, increases or decreases, compared with those for 1910 11, from July 1, 1911:—

	Earnings.	Expenses.	Net Profits.	Net Increases
July	$ 9,661,818.14	$5,958,789.81	$3,703,028.33	$218,408.74
Aug.	10,421,904.42	6,346,333.41	4,075,571.01	383,898.68
Sept.	10,049,084.97	6,131,638.17	3,917,446.80	5,847.16
Oct.	11,207,991.99	6,526,887.24	4,631,104 75	175,944.23
Nov.	10,570,694.80	6,583,328.31	3,987,366.46	250,244.23
Dec.	10,654,871.67	6,549,141.41	4,105,730.26	819,196.37
Jan.	7,328,781.81	6,245,924.11	1,082,857.70	426,739.83
Feb.	8,931,907.20	6,548,040.53	2,338,866.67	1,239,159.16
Mar.	10,519,328.76	6,8°0,317.65	2,718,401.11	561,334.57
Apr.	11,301,349.46	7,185,597.67	4,115,751.79	958,777.18
May	11,360,420.81	7,679,905 58	3,680 515.23	736,430.47
June	11,311,897.20	7,464,794.51	3,846,602.69	821,931.64
	$123,319,541.23	$80.021,298.40	$43,298,242.83	$6,598,412.26
Inc.	$19,151,733.02	$12,553,320.76	$6,598,412.26	.....

Approximate gross earnings for July, $11,641,000 against $9,291,000 for June, 1911.

The mileage in operation was increased, during July, to 11,152.

The net results of the company's operations for the year ended June 30, are as follows:—

Gross earnings	$123,319,541
Working expenses	81,021,298
Net earnings	$ 43,298.243
Net earnings of steamships in excess of amount included in monthly reports..	1,104,449
	$44,402,692
Deduct fixed charges	10,524,937
Surplus	$ 33,877,754
Deduct amount transferred to steamship replacement account	$1,000,000
Deduct contribution to pension fund	125,000 1,125,000
Net revenue available for dividend	$ 32,752,754
Surplus carried forward after payment of all dividends declared for the year	$ 17,560,519
Special income from interest on land sales and from other extraneous assets	$ 5,158,585

Grand Trunk Railway Earnings, Etc.

Subject to audit, tbe accounts for the half year ended June 30, show the following results:—

Gross recepits	$18,673,041
Working expenses	13,603,371
Net receipts	$ 5,069,670
Deduct debit balance on account of rentals, outside poerations and car mileage	163,145
Total net revenue	$ 4,906,525
Net revenue charges	2,502,693
Balance	$ 2,403,832
Deduct Canada Atlantic Ry. deficiency	$257,136
and Detroit, Grand Haven and Milwaukee Ry. deficiency	246,909 504,045
Surplus	$ 1,899,787

This surplus of $1,899,787 added to the balance of $33,116 from Dec. 1911, makes a total of $1,932,-903 available for dividend, which will admit of the payment of full dividend for the half year on the 4% guaranteed stock and first and second preferred stocks, leaving a balance of about $41,395 to be carried forward.

Tbe accounts of the Grand Trunk Western Ry. for the yera ended June 30, after providing for all fixed charges, including the debit balance of $153,215, brought forward from the previous year, show a deficit of $78,621, which will be carried forward to the current year.

TRAFFIC RECEIPTS OF THE SYSTEM.

Aggregate from July 1 to July 31:—

	1912.	1911	Increase
G.T.R.	$3,689,098	$3,339,247	$349,851
C.A.R.	197,186	177,818	19,368
G.T.W.R.	573,014	551,903	21,111
D.G.H. & M.R.	185,752	171,322	14,430
Totals	$4,645,050	$4,240,290	$404,760

Long Distance Non Stop Trains in Europe.

The longest nonstop trains run on European railways are in England, where there are 11 runs over 150 miles, three of which are over 200 miles (maximum 226), and the average speeds range from 50 to 58 m.p.h. for the entire distance. In Germany, there are five runs of over 150 miles (maximum 178), with speeds of 48½ to 53½ m.p.h. France has only one run of over 150 miles (158), with a speed of 53¾ m.p.h. American railways rank much lower, the longest nonstop run being 141 miles, from Englewood (Chicago) to Fort Wayne, at 59 m.p.h. It is true that the timetables show runs as long as 438 miles, but these include actual stops to change engines, etc. The English runs are for regular trains, but some of the foreign long distance runs are special steamer trains or international express trains. The accompanying table gives particulars of some of the runs mentioned:—

Train runs	Distance miles	Time min.	Speed m.p.h.
England			
London-Plymouth	226.75	247	55.1
London-Rhyl	209.25	237	52.9
London-Shipley	206.50	245	50.6
London-Liverpool	192.25	215	53.6
London-Wilmslow	176.82	193	55.0
Wakefield-London	175.75	185	57.0
London-Exeter	173.75	180	57.9
Germany			
Berlin-Hamburg	178.20	200	53.4
Munich-Wurzburg	178.20	205	50.4
Berlin-Liegnitz	164.3	203	48.6
France			
Paris-Boulogne	157.8	170	55.7

W. J. GERBRACHT, travelling auditor, C.P.R., Nelson, B.C., was married, Aug. 8, to Miss C. M. Hyde, at Ingersoll, Ont.

RAILWAY DEVELOPMENT.

Projected Lines, Surveys, Construction, Betterments, Etc.

Alberta Interurban Ry.—We are officially advised that a subcontract for construction has been let to John Breckenridge, Calgary, Alta., and that work will be started as soon as the plans have been approved by the Board of Railway Commissioners. ((July, pg. 339).

Algoma Central and Hudson Bay Ry.—The Board of Railway Commissioners has approved of revised location plans for the extension of the line from Hobon, Ont., between mileage 82.8 and 123.53. (Aug., pg. 411.)

Atlantic, Quebec and Western Ry.—The Board of Railway Commissioners having authorized the opening for traffic of the line from Grand River to Gaspe, Que., mileage 51.5 to 102.5, a passenger train service was started Aug. 1. With the opening of this section of line, there is in operation a through line from Matapedia, on the Intercolonial Ry., to Gaspe, 202.5 miles, under one management. The first section of 100 miles from Matapedia to New Carlisle is the old Atlantic and Lake Superior Ry., now the Quebec Oriental Ry. (Aug., pg. 411.)

Burrard Inlet Tunnel and Bridge Co.—The Board of Railway Commissioners at Vancouver, July 28, directed the company to start work on the construction of the bridge within 30 days after the plans are approved by the Board's engineer.

At a meeting of directors, Aug. 7, a resolution was passed authorizing the company's consulting engineers in London, Eng., to have the complete plans and specifications for the bridge, with an opening span of 200 ft., in accordance with the orders of the Board, prepared as speedily as possible.

The company is being financed to a large extent by the municipalities, while the Vancouver, Westminster and Yukon Ry. has secured a Dominion subsidy towards building a bridge. The two companies agreed to consolidate interests so far as the bridge is concerned. Differences have arisen as to the location of the bridge, and the V. W. and Y. Ry. objects to the location on the ground that it is to be used for railway lines which will compete with those it proposed building. In giving a decision, Assistant Chief Commissioner Scott said the B. I. T. and B. Co. would have to compensate the V. W. and Y. Ry. for any cost to which it may be put in altering its plans to suit the revised location of the bridge. The appli-cation of the B. I. T. and B. Co. for approval of its line is to stand over for a year, it being understood that in the meantime the V. W. and Y. Ry. shall show some signs of activity. (Aug., pg. 411.)

Canada and Gulf Terminal Ry.—We are officially advised that surveys are being made with a view of immediate further construction from Matane, Que., towards Gaspe Basin, Que. The line is in operation from St. Flavie, on the Intercolonial Ry. to Matane, 34 miles. (May, pg. 238.)

Central Ry. of Canada.—W. D. Hogg and E. Wilson Smith, Montreal, are reported to have been elected directors in place of Hon. A. Campbell, Toronto, and E. Goff Penny, Montreal, resigned. Mr. Campbell was president of the company.

The Board of Railway Commissioners has authorized the Canadian Northern Ontario Ry. to build a spur line at McAlpine station, for use by the C. Ry. of Canada for construction purposes. (Aug., pg. 411.)

Dominion Atlantic Ry.—Press reports state that the C.P.R. proposes to spend over $1,000,000 on betterments on the line. At present the bridge structures are being brought up to C.P.R. standard, some being rebuilt and others strengthened. Other betterments are being arranged for. (Aug., pg. 411.)

Edmonton, Dunvegan and British Columbia Ry.—The Board of Railway Commissioners has authorized the company to build its line across the Canadian Northern Ry. at grade in sec. 35-55-25, west of the 4th meridian, just south of Morinville, Alta., on installing an interlocking plant; and has also approved of location plans for the line from mileage 29.783 to 68.30 out of Edmonton. (Aug., pg. 411.)

Erie, London and Tillsonburg Ry.—The Board of Railway Commissioners has approved of location plans for this projected railway from mileage one, near Port Burwell, to Aylmer, Ont., at mileage 13.6. The Aylmer, Ont., town council is being asked to approve of the route through that town, the consent being asked for by W. H. Biggar, K.C., General Counsel, G.T.R. The charter for the E. L. and T. Ry. was obtained by J. H. Teall, of Tillsonburg, Ont., and it is reported that it was recently acquired by the G.T.R. (May, pg. 238.)

Esquimalt and Nanaimo Ry.—A new freight station has been completed at Duncans, B.C., and a new passenger station is under construction at the same place. The clearing of the line from Duncans to Cowichan Lake is in progress, the Island Lumber Co. having the contract.

R. Marpole, Vice President, and other officials, made a trip of inspection over the line, Aug. 2, including the extension to Cowichan Lake, and the branch to Osborne Bay.

Culliton Bros., Spokane, Wash., who have a contract for the first 10 miles north of McBride Jct., B.C., have been given another contract for a further five mile section. J. W. Hoard, Victoria, who has a contract for a five mile section from Trent River southwest, will probably be given a further five miles.

Fredericton and Grand Lake Coal and Ry. Co.—A plan of the proposed bridge across the Nashwaak River, and a description of the site has been deposited with the Registrar of the county of York, and application is being made to the Governor-in-Council for approval of the same.

The Minto Coal Co. has been incorporated under the New Brunswick Companies Act, with a capital of $400,000 and offices at Minto, N.B., to develop collieries, and deal in coal, coke, etc. The company is given power to build tramways, piers, wharves, coal pockets, and to own steam and other vessels, etc. The provisional directors are:—Sir Thos. Tait, V. E. Mitchell, Montreal; A. H. Slipp, R. B. Harrison, Fredericton, N.B.; J. Henderson, Northfield, N.B. We are advised that it is not the company's intention to place any securities upon the market. (Aug., pg. 411.)

Howe Sound and Northern Ry.—See Pacific Great Eastern Ry. (June, pg. 300.)

Hudson Bay and Pacific Ry.—The creditors and shareholders of the H. B. and P. Development Co., London, Eng., on Aug. 7, nominated Sir W. B. Peat as liquidator. A London cable says: "The company's history really consisted of repeated attempts to borrow money. It was successful in borrowing a little, but had to pay an awful price for it." (Aug., pg. 411.)

Intercolonial Ry.—An order for 5,000 tons of 80 lb. steel rails has been placed with the Dominion Iron and Steel Co., Sydney, N.S.

A contract has been let to Morrison and Clark, Summerside, P.E.I., for the erection of a 10-stall locomotive house and annex, brick chimney with concrete foundation, turntable ring wall and centre foundation, concrete cinder pit, and moving existing stores and office building and providing new foundation,—at Point Tupper, N.S.

J. H. Evans is reported to be making arrangements for a survey of the line from Point Tupper to Sydney, with the view of improving the alignment, cutting down gradients and eliminating curvature. Owing to the great increase in traffic since the line was originally built, it is stated that the management is desirous of securing a line which can be operated at less cost than the present one.

In connection with the proposal to build a line to Wallace Harbor, N.S., by the Cumberland Ry. and Coal Co., referred to in Canadian Railway and Marine World for August, we are officially advised that no actual work has been done. The Dominion Parliament last session granted $60,000 to cover the cost of building a line from Wallace station to Wallace Harbor, three miles, it being understood that the Dominion Coal Co. is to build the necessary pier and coal handling plant, and that the Department of Public Works will do the necessary dredging of the harbor to permit of deep draught vessels reaching the site of the proposed pier. (Aug., pg. 411.)

Kettle Valley Lines.—An agreement has been concluded between the city council of Grand Forks, B.C., the Kettle River Valley Ry. and the C.P.R., under which the two railway companies will provide joint yards, shops, roundhouses, etc., in Grand Forks. The work, it is reported, will be started immediately.

Press reports state that the ballasting and other work on the section of the line under construction in the vicinity of Merritt, B.C., will be completed early in Oct. The work in progress consists of ballasting, the erection of station houses and the stringing of the telegraph line.

The Board of Railway Commissioners has approved of location plans for the extension of the line, between mileage 40 and 57.4, west of Hydraulic Summit, B.C. (Aug., pg. 412. See also Midway and Vernon Ry.)

Kootenay and Alberta Ry.—We are officially advised that construction on the line from near Pinetree station, on the C.P.R. Crowsnest Pass line, to Beaver Creek, Alta., has been completed. No arrangements have yet been made for its operation. (June, pg. 300.)

Midway and Vernon Ry.—The commission appointed by the British Columbia Government to settle up the claims against the old M. and V. Ry. in respect of the work done from Midway to Rock Creek, which has been taken over for the extension of the Kettle Valley Lines, has practically completed its work. The total amount awarded is about $15,000, and Judge Foran of Nelson, the chairman of the commission, is reported as stating, Aug. 3, that the amounts awarded the several claimants would soon be paid over. One half of the total amount will be paid by the Provincial Government and the other by the Kettle River Valley Ry. This will close up the history of the M. and V. Ry. project. (May, 1910, pg. 353.)

Minneapolis, St. Louis and Canadian Ry.—The names mentioned in the incorporation papers for this new company are:—N. Erb, President, Minneapolis and St. Louis Rd.; W. G. Bierd, connected with the M. and St. L. Rd.; J. Wellman and H. A. Harrison, representing two New York banking houses. The organization meeting was held in Minneapolis, Minn., July 22, when N. Erb was elected President, and W. G. Bierd, Vice President. The President is reported as stating that preparation for construction of a line to the Canadian border would be started in the fall. (Aug., pg. 412.)

Minneapolis, St. Paul and Sault Ste. Marie Ry.—The new through line, giving a direct connection between Minneapolis, Superior and Duluth, Minn., was opened for traffic, Aug. 2. It starts from the main line at Dresser Jct., and passes through Frederic and Boylston Jct., Wis., connecting with the previously existing lines near Superior.

Press dispatches from Chicago, Ill., Aug. 12, state that announcement was made that day of the purchase by the Central Terminals Co. of parcels of land at a cost of $1,719,153, in addition to the 208 already bought for terminals of the M. St. P. and S. S. M. Ry., which enters Chicago over the tracks of its subsidiary, the Wisconsin Central Ry. (Aug., pg. 412.)

North Ry.—It is reported that the sea terminal of this projected railway from Montreal to Hudson Bay will be on the west side of the Nottaway River, Que. The route from Montreal is via Ottawa and along the valley of the Coulonge River to Bell River, near which the National Transcontinental Railway will be crossed, and along the valley of the Nottaway River. Three engineering parties are in the field. (Aug., pg. 412.)

Pacific Great Eastern Ry.—The British Columbia Government has authorized the issue of the bonds, which it undertook to guarantee, and the construction of this railway from Vancouver to Fort George, B.C. Route maps of the line from Vancouver to Lillooet, 150 miles, have been filed with the Government. So far as they affect the city and the district of North Vancouver, they have been approved by the local municipalities, but West Vancouver has made an objection, with the result that the Government has held up the consideration of the matter so far as it affects that municipality.

The section of the general location of this projected railway approved by the Minister of Railways for British Columbia extends from the boundary of North Vancouver to the north boundary of the district of New Westminster, from D.L. 204 to Green River, north of D.L. 1276.

The question of terminals in North Vancouver is under consideration. The route map ties up with the line of the Howe Sound and Northern Ry., which the P.G.E.R. Co. has power to acquire, and negotiations for the purchase of that line have been resumed. J. Callaghan, Vancouver, is Chief Engineer.

P. Welch, Vice President, is quoted as stating, Aug. 7, that construction would be started early in September near the confluence of the Squamish and Cheakamus rivers, about 11 miles from Newport; that by the end of the year construction gangs would be at work along the line to Lillooet, 120 miles, and that in the spring construction would be started from Fort George southerly.

D'Arcy Tate, Vice President and General Counsel, is reported as stating, July 30, that satisfactory progress had been made with the negotiations for the purchase of the Howe Sound and Northern Ry., and he expected they would be closed soon after the arrival in Vancouver, during September, of J. W. Stewart, President, P. G. E. Ry., who is in Europe. In addition to a main line 12 miles long, now in operation, the Howe Sound road, of which Mr. Keith is President, has six miles of branch lines extending into logging camps in Squamish Valley. The southern terminus is Newport, at the head of Howe Sound. The company has a charter for a railway from Newport to Lillooet. The surveys have been completed and a subsidiary company also owns a charter for an extention from Lillooet to Fort George, following the same route as the Pacific Great Eastern.

P. Welch, Vice President, is reported as stating, Aug. 17, that orders have been given for grading outfits to be shipped in to Newport, and conveyed thence by rail to the point where it is proposed to start construction. The right of way as far as Green Lake has been cleared, and it is expected that by the end of the year the 120 mile section to Lillooet will be covered with men. Engineers are making surveys for the line between Point Atkinson and Newport. Owing to the deep water close in shore it will be impossible to build bridges consequently there will be a good deal of tunnelling.

Quebec and Saguenay Ry.—Press reports state that, owing to the shortage of steel, the company will not be able to complete the laying of track to Murray Bay, Que., sufficiently early to enable to allow of the opening of the line for traffic this year, as was expected. (Aug., pg. 412.)

St. John and Quebec Ry.—A. R. Gould, President, is reported as stating, July 31, that there were over 1,000 men at work on the line between St. John and Grand Falls, N.B., and that good progress was being made with grading. (July, pg. 340.)

The Southampton Ry. is projected from Millville, N.B., on the C.P.R. Gibson branch, to Lower Southampton, on the St. John River, 13 miles. Six miles, from Millville to Pender's Mills, have been graded, track laid and ballasted complete, with the exception of dressing up. A daily train service is being given on this mileage. Grading has been nearly completed on the remaining seven miles to Southampton, and it is expected to have the work completed and the whole line in operation this season. The line is to be operated under lease by the C.P.R. D. W. Brown, Fredericton, N.B., is Chief Engineer. (Aug., pg. 412.)

Timiskaming and Northern Ontario Ry.—J. G. McMillan, who has made a report of his preliminary survey of the country between Cochrane and Moose River, has returned to complete his work. An engineering party, in charge of W. R. Maber, is engaged in locating a line from Cochrane northerly, and, Aug. 5, was reported to be working between the Metagami and Frederickhouse rivers. J. L. Englehart, Chairman of the Commission, who returned to Toronto July 30 from an inspection of the line, is reported as stating that the work mentioned is being undertaken so that the Commission will have things in readiness should it be decided at the next session of the legislature to extend the line to Hudson Bay. (Aug., pg. 412.)

The Vancouver Terminals Co. submitted plans to the Vancouver city council, Aug. 2, for the laying out of extensive terminals. The details laid before the meeting by A. K. H. Macfarlane set out that the company proposes to build a line from New Westminster to Vancouver, and to lay out a railway terminal, with docks and harborage in Vancouver by the reclamation of Spanish Bank, and to lay out a central station and local freight yard in the heart of the city by the reclamation of 40 acres of False Creek under the Granville St. bridge. The plans show 12 miles of actual dock frontage, with the reclamation of 1,000 acres of land and provision for 150 miles of terminal trackage. The council promised to give consideration to the project at a future meeting.

Vancouver, Westminster and Yukon Ry.—See Burrard Inlet Tunnel and Bridge Co.

White Pass and Yukon Route.—We are officially advised that the branch line recently completed to the Pueblo mine leaves the main line 1,055 miles north of Skaguay, and extends 11 miles northwesterly in the Yukon Territory. The maximum gradient is 2.25% against northbound and 1.5% against southbound traffic, with a maximum curvature of 15 degrees. There are no tunnels, but there are seven wooden trestles. The entire traffic movement is southbound, and consists of ore. No further extensions are contemplated, and there is no construction in progress at present. (Aug., pg. 412.)

Railway Finance, Meetings, Etc.

Buffalo and Lake Huron Ry.—The report for the half year ended June 30 shows that after providing for the interest on the first and second mortgage bonds, and the usual dividend of 5s. 3d. a share, and making the necessary charges against revenue account, there remained a balance of £30 19s. 6d., which has been transferred to investment account. The railway is operated under lease by the G.T.R., on a half yearly rental of £35,000.

Canadian Pacific Ry.—Following the annual meeting of shareholders to be held in Montreal, Oct. 2, a special meeting will be held to authorize the issue of consolidated debenture stock to acquire the Dominion Atlantic Ry., as outstanding securities and to consider a recommendation from the directors to increase the capital stock by not exceeding $60,000,000, such additional capital to be issued as may be determined by the directors.

Cap de la Madeleine Ry.—A meeting of shareholders will be held in Montreal, Sept. 3, to pass resolutions approving of the terms upon which the line is to be conveyed to the C.P.R.

Dominion Atlantic Ry.—Passenger earnings for July, $119,895.38; freight earnings, $38,472.43; total earnings, $158,367.81, against $160,600 total earnings for July, 1911.

Esquimalt and Nanaimo Ry.—Application is being made to the Board of Railway Commissioners for a recommendation to the Governor-in-Council to sanction a lease of the company's lines to the C.P.R. for 99 years from July 1, 1912.

Grand Trunk Ry.—Copy of the conditional sale of rolling stock between the American Car and Foundry Co. and the G.T.R., dated July 24, has been filed with the Secretary of State at Ottawa.

Kingston and Pembroke Ry.—The shareholders at the annual meeting at Kingston, Ont., Aug. 14, passed a resolution approving of the leasing of the line in perpetuity to the C.P.R. The terms and conditions of the lease were not made public. Before being final it will have to be ratified by the C. P. R. shareholders. Following are the directors for the current year:—President, W. D. Matthews, Toronto; Vice President and General Manager, W. R. Baker, Montreal; other directors, J. B. Walkem, W. F. Nickle, R. Crawford, W. Harty, Kingston, Ont.; H. P. Timmerman, A. R. Creelman, Montreal; J. T. Arundel, Toronto.

Nelson and Fort Sheppard Ry.—See Red Mountain Ry.

Quebec Central Ry.—Gross earnings for 12 months ended June 30, $1,355,301, against $1,208,948 for same period 1910-11.

Red Mountain Ry.—Nelson and Fort Sheppard Ry.—Vancouver press reports state that the C.P.R. held options, expiring Aug. 31, for the purchase from the Great Northern Ry., U.S., of the Red Mountain Ry. and the Nelson and Fort Sheppard Ry. in B.C.

St. Marys and Western Ontario Ry.—A special meeting of shareholders will be held in Montreal, Sept. 9, to consider the expediency of cancelling the present lease and entering into a new one upon terms to be submitted, and to decide upon the means to be adopted for raising funds.

Temiscouata Ry.—Profit on operation for May, $5,871.

White Pass and Yukon Route.—Earnings for six months ended June 30, $315,769, against $397,130 for same period 1911.

S. Hale has been appointed General Manager of the Algoma Steel Corporation, Sault Ste. Marie, Ont.

Canadian Pacific Railway Construction, Betterments, Etc.

Elevator at St. John.—Work has been started upon the preparation of the foundations for the new 1,000,000 bush. elevator at West St. John, N.B., to the west of the existing elevator. The new building will be of reinforced concrete and will be capable of unloading 160 cars in ten hours, and, by means of a shipping gallery system, of loading into vessels lying at different berths. The machinery will be operated by electricity. The new elevator is to be completed for the winter of 1913. The John S. Metcalf Co., Montreal, has the contract for the design and construction.

Farnham Subdivision Second Track.—The Board of Railway Commissioners has authorized the revision of grade of the present main line, and the building of a second track from mileage 17.35 on the Farnham subdivision to Iberville Jct., and thence to Highlands, Que., mileage 41.8.

Quebec Yards, etc.—A new plan covering the portion of Victoria Park required by the C.P.R. for yard extension purposes is under consideration by the city council. There will not be so much encroachment on the park with this plan as under the plan first considered.

Windsor St. Station, Montreal.—Two of the new tracks at this enlarged station, have been in use since Aug. 1, and a third track was expected to he ready by Aug. 31.

Ottawa Improvements.—D. McNicoll, Vice President, is reported as stating that work will he started early in the spring of 1913, improving the entrance of the company's lines into Ottawa, and that some detail matters have to be settled before the plans can be finally approved.

Campbellford, Lake Ontario and Western Ry. — A special meeting of shareholders will be held in Montreal, Sept. 9, to approve of a lease of the line to the C.P.R., and to take steps for raising funds to construct and equip the line.

The Board of Railway Commissioners has authorized the changes in the line at mileage 43.86, and a crossing of the Bay of Quinte Ry.; has approved location plans from King St., Port Hope to mileage 127.3; through the town of Whitby; from mileage 160.86 to 161.0; from mileage 165 to 174, and from 176.0 to 183.51; revised location plans from mileage 63.59 to 68.50, from mileage 70.25 to 72.44, and from mileage 155.13 to 157; has authorized the crossing of the Oshawa Electric Ry. at mileage 158.85; and has authorized a junction to be made with the C.P.R. Montreal-Toronto line at mileage 87.41 westerly from Havelock, Ont., mileage 183.51 of the C. L. O. & W. Ry.

Construction is being rapidly proceeded with and it is expected to have the section from Leaside Jct. to Whitby completed this year. Just east of Whitby there will be a bridge across Ruffins creek, 900 feet long, and 110 feet above high water level.

North Toronto Improvements.—The tenants of the buildings and land on the line of the track elevation in North Toronto, were notified Aug. 1 to vacate immediately. Large quantities of materials are being delivered, and a good deal of other preparatory work is being gone on with. The company's engineers have opened an office at the corner of McPherson Ave. and Avenue Road from which the construction work will be directed. The project comprises a viaduct across Yonge street, a union station, and track elevation westerly to Dovercourt Road.

Islington West.—The second track out of Toronto, ends a short distance west of Islington. A survey party under the direction of H. D. Lumsden, started in at this point Aug. 6, and is working westerly. There have been a number of surveys made in this vicinity within the last six or seven years with the view of eliminating the Erindale gradient, and cutting out the long curve round to Streetsville Jct., as well as surveys for a second track, and for a line connecting the Toronto-Windsor line, with the Sudbury line to the north and Hamilton to the south.

Woodstock Linc Revision.—The Board of Railway Commissioners has authorized the revision of the line through Woodstock, Ont., a subway to be built under Dundas St. Twenty per cent. of the cost of the subway is to be paid out of the Dominion railway grade crossing fund.

Collingwood Southern Ry.—Local press reports state that the company's agents have secured most of the right of way from Baxter on the Toronto-Sudbury line to Collingwood, and that a start will be made with construction early in September. Representatives of the Dominion Construction Co. are said to have been going over the located route Aug. 6.

Sudbury-Port Arthur Second Track.—Press reports state that subcontracts on the several sections of this work which has been put under contract to the Dominion Construction Co., have been let to McCaffrey and McCaffrey, W. T. S. Tomlinson, A. and A. Zebron, M. McCormick, Welsh Bros.

Fort William-Winnipeg Second Track.—The Board of Railway Commissioners has authorized the opening for traffic of the second track on the Kenora, Ont., subdivision, from mileage 114.54 to 119.06.

North Transcona Terminals.—Construction has been started on the new terminals at North Transcona, near Winnipeg. The contract for grading and track laying has been let to Foley Bros., Welch and Stewart, and it is expected to complete about 750,000 cubic yards of levelling and grading, and to lay 35 miles of track this year. By the fall of 1913 it is expected to have the eastbound and westbound yards completed. This will require about 2,000,000 cubic yards of levelling and grading, and about 70 miles of track. A 30 stall locomotive house, together with machine shop, boiler house, stores, etc., are being constructed, the contract for which has been let to the Lyall-Mitchell Contracting Co. There is also under construction a transfer elevator with a storage capacity of 1,000,000 bush., with a grain drier and the usual elevator facilities. Details of this elevator, which is being built by Barnett, McQueen & Co., were given in Canadian Railway and Marine World for July.

Gimli Branch Extension.—Press reports state that a contract has been let to T. Ingaldson, Arberg, Man., for the clearing of the right of way for the extension of the branch now terminating at Gimli, along the shore of Lake Winnipeg, for 26 miles to Riverton, on the Icelandic river. Work is reported to be in progress.

Moose Jaw Southwesterly.—We are officially advised that the extension of the branch running southwesterly from Moose Jaw, Sask., which now terminates at mileage 37.85, will not be gone on with this year. The route of the extension has been approved for 16.62 miles.

Swift Current Northwesterly.—This line is already in operation from Swift Current northwesterly to beyond Cabri, Sask., 34 miles. The route plan, recently approved by the Minister of Railways, shows an extension to the Saskatchewan Alberta boundary immediately south of the south Saskatchewan river. This extension is being built this year.

Ogden Shops, Calgary.—We are officially advised that excellent progress is being made with the erection of the shops at Calgary, Alta., a complete preliminary description of which, with plan, was published in Canadian Railway and Marine World for February.

The locomotive shop, boiler shop and blacksmith shop are erected; the roof sheathing has been put on, and the roof waterproofing is being applied; building walls are being laid up; concrete erecting pits have been put in, heating duets in five buildings are being constructed, and the contractors are ready to put in machine tool foundations.

The coach repair and paint shop and the tender shop and planing mill are enclosed; the storehouse and office building and the foundry are being erected; the yard crane runway has been erected; foundations are in place for the power house and the freight car shop, and these structures are being erected; sewer and water piping have been installed in the shop yards, and the grading of the property is going ahead, there being considerable cuts and fills, requiring the services of two steam shovels on the site.

The contractor, Westinghouse, Church, Kerr & Co., expected to continue the present progress of the work to an early completion.

Calgary Irrigation Belt Lines.—In connection with the opening up of the lands in the irrigation belt, easterly of Calgary, a line was built northerly from Langdon to Acme, with a branch from Irricana easterly and southerly through Tudor. This branch is being extended to Dead Horse Lake and then southeasterly to a junction with the main line at Bassano. The track laying gang was reported Aug 7 to be nearing Bassano, and it was expected to have the steel laid by Aug. 31.

Alberta Central Ry.—The amended route map of this line from Rocky Mountain House to the Yellowhead Pass, is projected to give a 0.4 gradient throughout. The previously located line is followed to 140 miles from Red Deer, a few miles beyond the point from which a branch line is located southwesterly to the Brazeau collieries. The line first located from the 140 mile post proceeded almost due westerly to the Pass, but it was found to be impracticable to obtain a 0.4 gradient on it without a series of further gradients and considerable tunnelling. The route now adopted, although very much longer, has an advantage of a 0.4 gradient all the way, easy of construction and traverses more directly the extensive coal fields of the Brazeau district. It runs northerly from the 140th mile post in tp. 44, range 16, west of the 5th meridian, and enters the Athabasca river valley about 50 miles west of Edson on the G. T. Pacific Ry., and follows the route of that line and the Canadian Northern Ry. from this point to the Yellowhead Pass in tp. 45, range 4, west of the 6th meridian. J. Grant MacGregor is assistant engineer in charge of construction.

Grand Forks, B.C.—The agreement between the city council, the C.P.R. and the Kettle Valley Lines, by which the railway companies will erect joint terminals in Grand Forks, B.C., awaits the sanction of the ratepayers. Preparations are being made for starting work.

Rossland Branch Electrification.—In connection with the announcement that the C.P.R. purposed electrifying its line from Nelson to Rossland, B.C., the West Kootenay Power and Light Co. proposes to enlarge its power plant. This company controls 30,000 of the 35,000 estimated horse power that may be developed at Bonnington Falls. With the completion of the improvements contemplated the company will have 19,000 h.p. available.

Coquitlam Terminals.—Rapid progress has been made with the erection of the

terminal buildings at Coquitlam, B.C. It is expected that the locomotive house will be completed early in September. The shunting yard is being laid out on the hump principle, with 10 tracks running west and 17 east. The tracks stretch from the Pitt river to Coquitlam. Other trackage is being laid down. Tenders are being asked for a three-track bridge across the Coquitlam river, and surveys are being made for the erection of a double track bridge across the Pitt river, in connection with the company's plans for the terminals.

Ruby Creek-Vancouver Second Track.—The construction of a second track from Hammond to Vancouver, B.C., 24 miles, is reported to be practically completed. The work is being carried out under the charge of H. Kindal, division engineer, Vancouver.

We are officially advised that Grant Smith and Co. have been given a contract for building a second track from Ruby Creek to Hammond, 57 miles, which will give a continuous second track to Ruby Creek from Vancouver, 81.1 miles.

Burrard Inlet Line.—We are officially advised that while the Minister of Railways has approved, with certain restrictions, the route map of the proposed line along the north shore of Burrard Inlet, the location plans are not yet finally settled. It is not, we are informed, the intention to proceed with the construction of the line under present circumstances. The route plan approved by the Minister of Railways shows a line of 21 miles from mileage 115 of the Cascade subdivision to North Vancouver

Manufacturers Urged to Load and Unload Cars Promptly.

J. E. Walsh, Manager Transportation Department, Canadian Manufacturers Association, has issued the following circular to members:—

Notwithstanding the fact that the railways are adding materially to their equipment and terminals, the indications are that the car shortage and congestion at terminals is going to be worse this fall than for some years past. This statement is based on the car surplus and shortage figures of the American Railway Association.

Upon the ability of the railways to move the crops promptly will depend to a great extent the business welfare of the country. Everybody can help by facilitating the movement of any cars he consigns or receives, viz., by loading and unloading as expeditiously as possible. Every time the loading or unloading of a car is needlessly delayed the available supply of cars is correspondingly reduced. If a shipper by his own act reduces the available supply of cars he cannot very well complain of a shortage. Cars are furnished for transportation, not for storage, and every one used for storage reduces the number available for transportation.

The annual crop movement beginning around October 1st brings a car shortage lasting about four months; during the balance of the year there is usually a surplus. By moving as much as possible of your freight inwards and outwards within the next few weeks you will be helping yourself, the railways, and all others concerned.

The C. P. R. has entered an action against the G.T.R., at Osgoode Hall, Toronto, to recover $2,277.28 alleged to be due as the result of a derailment at Woodstock, Ont. The claim is made up of, damage to equipment, $775.30; clearing wreckage and repairing track $164.18, and $726.03 alleged to have been paid to the Pere Marquette Rd. for taking C. P. R. trains over its line. The derailment in question occurred in Dec., 1910.

Railway Rolling Stock Notes.

The Central Ontario Ry. has ordered 25 ore cars from J. T. Gardner, Chicago, Ill.

The Canadian Northern Ry. will probably be in the market shortly for between 3,000 and 4,000 freight cars.

The Canadian Northern Ontario Ry. has ordered 50 coal cars from J. T. Gardner, Chicago, Ill.

The Duluth, Winnipeg and Pacific Ry. has received 150 coal cars, from J. T. Gardner, Chicago, Ill.

The Halifax and South Western Ry. has ordered six excursion cars from J. T. Gardner, Chicago, Ill.

The Niagara, St. Catharines and Toronto Ry. has ordered 10 coal cars from J. T. Gardner, Chicago, Ill.

A United States press report states that the G.T.R. has ordered 2,000 thirty ton box cars and 50 tank cars, in the U.S.

The Dominion Bridge Co. has received one Lidgerwood unloader from the Canadian Car and Foundry Co., Montreal.

The Intercolonial Ry. has received one first-class car from the Preston Car and Coach Co., completing an order of five.

The Algoma Central and Hudson Bay Ry. has received four first class cars from the Canadian Car and Foundry Co., Montreal.

The Canadian Car and Foundry Co., Montreal has delivered one logging engine car to Allis-Chalmers-Bullock Ltd., Montreal.

The Canadian Northern Quebec Ry. has ordered 50 coal cars, 50 flat cars and six excursion cars from J. T. Gardner, Chicago, Ill.

The Brockville, Westport and North Western Ry. has ordered two first class cars and one combination car from J. T. Gardner, Chicago. Ill.

The Timiskaming and Northern Ontario Ry. has received two consolidation locomotives, Nos. 139 and 140, from the Canadian Locomotive Co.

The Grand Trunk Pacific Ry. has received 173 ballast cars, nos. 392820 to 392992, from the Canadian Car and Foundry Co., Montreal; and 256 flat cars. nos. 361642 to 361897, from the American Car and Foundry Co.

The G. T. R., between July 13 and Aug. 15, received three Pacific type locomotives, nos. 230 to 232, ordered Oct. 7, 1911, and two first class cars, from its Montreal shops; and 46 refrigerator cars, 157 automobile cars and 457 steel coal cars, from the U.S.

The Canadian Northern Ry. has ordered two cafe-parlor cars, from J. T. Gardner, Chicago, Ill.; four Pacific type locomotives, from the Montreal Locomotive Works, and 25 consolidation locomotives, from the Canada Foundry Co., Toronto, and is in the market for 50 or more additional locomotives.

The Reid Newfoundland Co. will complete the order for eight locomotives, placed last year at its shops at St. John's, before the end of this year. We have already given details of these. Four have been ompleted, a fifth was expected to be ready by Aug. 31, and the remaining are to be finished during the next four months.

J. H. Corbett and Sons Co., contractors, National Transcontinental Ry., Moncton, N.B., have ordered one Rodger double plough distributing car from the Hart-Otis Car Co., Montreal. Following are the chief dimensions:—

Capacity	30 tons
Length over end sills	32 ft.
Width over side sills	8 ft. 9 ins.
Height from rail to floor	4 ft. 1¼ ins.
Truck centres	23 ft. 8 ins.
Wheel base of truck	5ft. 2 ins.

Following are the chief details of the 60 logging cars which the C.P.R. recently ordered for the Esquimalt and Nanaimo Ry.'s Cowichan Lake branch, as mentioned in a previous issue:—

Capacity	80,000 lbs.
Length over end sills	41 ft.
Wheel base, extreme	36 ft. by 5 ins.
Truck centres	31 ft. 2 ins.
Truck, type	40 ton
Truck wheel base	5 ft. 4 ins.
Truck bolsters	Simplex
Width, over floor	9 ft.
Width over side sills	8 ft. 10 ins.

The Canadian Northern Ry., between July 15 and Aug. 15, received the following additions to rolling stock,—four consolidation locomotives, from the Canadian Locomotive Co.; two consolidation locomotives, from the Canada Foundry Co.; four first class cars, three second class cars, one dining car, three baggage cars and 140 box cars. from the Canadian Car and Foundry Co.; two baggage and mail cars and 80 box cars, from the Crossen Car Co.; and 40 box cars, from the Nova Scotia Car Works.

The C.P.R., between July 17 and Aug. 15, ordered the following rolling stock,—10 sleeping cars, five dining cars, 10 tourist cars, two double track snow ploughs, one double track flanger, and 20 type D.4 locomotives, from its Angus shops, Montreal; 13 steel snow ploughs, from the Canadian Car and Foundry Co., and 5,000 steel frame box cars, from Barney and Smith Car Co., Dayton, Ohio. We have been further officially advised that 6,000 standard steel frame box cars have been ordered from the Canadian Car and Foundry Co., for delivery by July 31, 1913.

The C.P.R., between July 17 and Aug. 15, received the following additions to rolling stock,—21 freight refrigerator cars, 25 stock cars, 50 vans, 587 wooden box cars, one pile driver, 12 tourist cars, 20 suburban cars, five U.3 switching locomotives, and three P.1 locomotives, from its Angus shops, Montreal; 177 steel frame box cars, 167 coal cars and 173 ballast cars, from the Canadian Car and Foundry Co., 20 dump cars, from the Hart-Otis Car Co.; 16 ballast ploughs and one Jordan ballast spreader, from F. H. Hopkins and Co., and 86 stone cars, from the Nova Scotia Car Works.

Following are chief details of the 41 Pacific type locomotives which the G. T. R. is having built by the Montreal Locomotive Works, as mentioned in previous issues:—

Cylinders, diar. and stroke	23 by 28 ins.
Driving wheels, diar.	31-69 ins.; 10-73 ins.
Boiler, outside diar. first course	70½ ins.
Firebox, length and width inside	96⅞ by 75¼ ins.
Tubes, no. and diar	181—2 ins.; 24—5¾ ins.
Tubes, length	20 ft. 7 ins.
Grate, area	60.6 sq. ft.
Wheel base, driving	13ft. 4 ins.
Wheel base, engine	33 ft. 2 ins
Wheel base, engine and tender	62 ft. 3½ ins.
Weight on leading truck	40,000 lbs.
Weight on drivers	145,000 lbs.
Weight on trailing truck	38,000 lbs.
Weight, total engine	223,000 lbs.
Weight of tender	144,600 lbs.
Capacity, water	8,000 U.S. gals.
Capacity, coal	10 tons
Superheater, type	Top header, double loop

Following are chief details of the one G 1 locomotive which the C. P. R. is building at its Angus shops, Montreal, as mentioned in our last issue:—

Weight on drivers	136,000 lbs.
Weight, total	217,000 lbs.
Cylinders, diar. and stroke	21 by 28 ins.
Valves, diar. and type	11 ins. piston
Drivers, diar.	75 ins.
Boiler, type	Extended wagon top
Boiler pressure	200 lbs.
Heating surface, tubes	2777 sq. ft.
Heating surface, firebox	183 sq. ft.
Heating surface, total	2960 sq. ft.
Heating surface, superheater	539 sq. ft.
Equivalent heating surface	3767 sq. ft.
Tubes, no. and size	193—2¼; 22-5¼ ins.
Tubes, length	19 ft. 4⅞ ins.
Firebox, type	Radial stay with cross stay
Firebox, dimensions	7 ft. 8⅛ ins. by 5 ft. 9⅞ ins.
Grate area	45.6 sq. ft.
Capacity, coal	10 tons

Capacity, water	5,000 gals.
Axles ..... main 9½ by 12 ins.; others 9 by 12 ins.	
Brakes	Westinghouse, E.T. 6
Brake beams	Simplex outside hung
Valve gear	Walschaert
Superheater	Vaughan and Horsey
Wheel centres	cast steel

Following are chief details of the 19 Pacific type locomotives which the G. T. R. is having built by the Baldwin Locomotive Works, Philadelphia, Pa., as mentioned in previous issues:—

Cylinders, diar. and stroke	23 by 28 ins.
Valves, type	Piston
Boiler, type	Straight
Boiler, pressure	185 lbs.
Boiler staying	Radial
Firebox, length and width	96⅞ by 75¼ ins.
Tubes, no. and diar.	181—2 ins.; 24—5⅜ ins.
Tubes, length	20 ft. 7 ins.
Driving wheels, outside diar.	69 ins.
Journals	9½ by 12 ins.
Truck wheels, front, diar.	31 ins.
Truck wheels, back, diar.	42 ins.
Wheel base, driving	13 ft. 4 ins.
Wheel base, total engine	33 ft. 2 ins.
Wheel base, engine and tender	62 ft. 3½ ins.
Weight on drivers	145,000 lbs.
Weight on front truck	40,000 lbs.
Weight on back truck	38,000 lbs.
Weight, total engine	223,000 lbs.
Weight, total engine and tender	368,000 lbs.
Tender, wheels, diar.	34 ins.
Journals	5½ by 10 ins.
Capacity water	8,000 gals.
Capacity, coal	10 tons
Superheater	Schmidt

Following the chief details of the 20 ten wheel locomotives, class D.4g., which the C.P.R. are building at it Angus shops, Montreal:—

Weight on drivers	103,000 lbs.
Weight, total	142,000 lbs.
Cylinders, diar. and stroke	19 by 24 ins.
Valves, diar and type	11 ins. piston
Drivers, diar.	62 ins.
Boiler, type	Extended wagon top
Boiler pressure	180 lbs.
Heating surface, tubes	925 sq. ft.
Heating surface, firebox	143 sq. ft.
Heating surface, total	1068 sq. ft.
Heating surface, superheater	231 sq. ft.
Heating surface, equivlaent	1414 sq. ft.
Tubes, no. and size	117-2 ins.; 18-5 ins.
Tubes, length	10 ft. 11-16 ins.
Firebox, length, width	8 ft. 3⅛ ins. by 3 ft. 5¾ ins.
Firebox, material and make	Otis firebox steel
Grate area	28 sq. ft.
Tank capacity, water	4,000 imp. gals.
Tank capacity, coal	10 tons
Axles ... main 8½ by 8½ ins., others 8 by 8½ ins.	
Brakes	Westinghouse, E.T.6.
Brake beams, tender	Simplex truss, inside hung
Couplers	Tower
Headlights	Oil, C.P.R. Standard
Steam heating ... Gold with Leslie reducing valves	
Superheater	Vaughan and Horsey
Wheen centres ... main, cast steel; others, cast iron	

Canadian Northern Railway Construction, Betterments, etc.

Canadian Northern Quebec Ry.—The locomotive house and machine shop at Limoilou, Que., are well advanced to completion, and work has been started on the erection of the car shops adjoining. A number of houses have been removed to make room for the approaches to the shops and the yard surrounding them which is to be laid out.

The company has started the laying of a permanent branch into the exhibition grounds at Quebec, on a right of way granted by the city.

The route map for a line from St. Jerome Jct., southerly through the counties of Two Mountains and Terrebonne to a junction with the line under construction from Hawkesbury to Montreal, near St. Eustache, has been approved by the Minister of Railways. After the old Montford and Gatineau Colonization Ry. was acquired by the C. N. Q. Ry. it was extended southerly from near Montford to St. Jerome, and the proposed line will give a direct connection with Montreal.

Montreal Tunnel and Terminal Construction.—Sir Donald Mann, recently laid before the Montreal board of control a complete statement of the company's plans for its lines in the city. From the tunnel portal within the city there will be a viaduct extending about 1,600 yards to the waterfront. The viaduct is an essential part of the company's plans, without it there would not be station facilities in the lower part of the city accessible to the business and financial districts; a local yard for light and perishable freight convenient to the produce and wholesale districts, and adjacent to facilities at present used for this purpose by another company, and a direct connection with the Harbor Commissioners, tracking along the river front. The viaduct would pass over land owned by the company, coming into view at the street crossings in the business sections upon ornamental bridges designed to give absolutely no interference with street traffic. The trains would all be operated by electricity. These plans are under considera tion. In a report to the city council Aug. 10, the board of control expressed opposition to the level crossings and to certain other points in the plans of the company's line from the tunnel portal on the Outremont side to the present station in the east end of the city.

Sir Donald Mann was in Montreal Aug. 13 inspecting the work being done on the northern end of the tunnel. Some 205 feet have been driven and timbered. The rock has been reached and a drilling plant is being installed.

Montreal-Ottawa-Port Arthur Line.—Sir Donald Mann is quoted as stating in Montreal, Aug. 15, that construction work is being proceeded with on the two bridges across the Back river. One of them is nearly completed, and considerable work has been done on the second. These bridges are on the new short line to Hawkesbury, Ont., which is expected to be completed this year. The line from Hawkesbury to Ottawa is already in operation.

Construction has been started on the section of the line from just outside Ottawa towards Pembroke, Ont. The work starts at Hog's Back, and the route is through Fitzroy Harbor, and Portage du Fort, but does not run into Pembroke. It crosses the C.P.R. in Pembroke township, and the G. T. R. in Stafford township and then follows the valley of the Tuchon river for a considerable distance.

The Board of Railway Commissioners has approved of revised location maps for the line through Beaucage, Boulter, Lander, Pentland, Master, Stratton and Barron tps. Nippissing district, and through unsurveyed territory in Sudbury and Algoma districts.

Track is reported to have been laid easterly from Port Arthur to McKenzie river, where a large steel bridge is to be built. A temporary trestle has been built for construction purposes, pending the erection next year of the permanent bridge.

Canadian Northern Ontario Ry.—The line from Toronto to Ottawa is being operated as far as Deseronto, where connection is made with the Bay of Quinte Ry., and the section of that line from Deseronto to Sydenham, 29.7 miles, has been incorporated into the line. There were gradients as high as 1.75% on the B. of Q. R., and to overcome these, revisions have been made at Newbury, three miles long; at Yarker, one mile long; and at Sydenham, 2.5 miles long, reducing the gradient to 0.5 and making it uniform with the whole line from Toronto to Ottawa. Between the points where revisions were made a considerable amount of train filling is being done, and when this is completed there will be no gradients exceeding 0.5%. At Yarker it was necessary to build a bridge over the Napanee River, 400 ft. long, and 37 ft. above high water. The revision work has been completed, and when the train filling is finished, new 80 lb. steel rails will be laid, so as to make the line conform to the general standard of construction. It is expected to have this work completed this season.

The steel work for the two bridges across Sydenham Lake is being erected. Grading is practically completed to Chaffey's locks. Considerable grading has been done right on to Ottawa, and track has been laid out of Ottawa to Hog's Back, where the line to Port Arthur branches off.

Plans are reported to be in preparation for laying out a terminal site on the north side of the Rideau River.

Sir Wm. Mackenzie, President, and D. B. Hanna, Third Vice President, were in London, Ont., Aug. 14, and discussed railway matters with the Mayor, who subsequently stated that the C.N.O. Ry. would come to London but beyond that it was impossible to say anything at present. The company's engineers are making surveys.

Canadian Northern Ry.—The company has given the Barnett and McQueen Co. a contract for an extension to its Port Arthur elevators, which will increase the capacity by 2,500,000 bush.

The plans for the cut-off from near River Park to the main line east of Winnipeg came before the Board of Railway Commissioners, Aug. 7. An inspection of the route was made, owing to the objection of residents, and the Board directed its engineer, H. A. K. Drury, to make a special survey and see whether any other route could be adopted which would serve the railway equally well and do less damage to property.

The extension of the Bird's Hill branch along the eastern shore of Lake Winnipeg to Fort Alexander, Man., is under construction. The grading is reported to have been completed from near the East Kildonan carline to Balsaam Bay, whence it will run in an almost straight line to Fort Alexander. Press reports state that a hydro-electric power plant is to be developed at Bonnet Falls, north of Fort Alexander, and that the branch will be operated by electricity.

Hon. F. Cochrane, Minister of Railways, is reported as stating that the Dominion Government has offered to guarantee the company's bonds to aid in the building of a line from Prince Albert, Sask., to a junction with the line to Hudson Bay, near Split Lake.

Press reports state that construction is being proceeded with on a branch line from Laird, Sask., northerly for about 12 miles to Carlton.

We are officially advised that a contract has been awarded to the Northern Construction Co. for the work on the Calgary-Macleod branch, south of Calgary, Alta.

Canadian Northern Pacific Ry.—Twohy Bros., Spokane, Wash., have been given a sub-contract by the Northern Construction Co., and Cowan Construction Co., for 100 miles north from Kamloops, mileage 60 to 160.

The Premier of British Columbia returned to Vancouver, Aug. 2, after a trip over the line under construction as far east of Kamloops. He is reported as stating that 82 miles of the line easterly from Kamloops have been completed, and that the bridges are expected to be completed within a year. The whole of the line is under contract to the Yellowhead Pass, and construction is being progressed with almost throughout the whole mileage.

The branch line projected from Kamloops to Vernon, B.C., will be about 85 miles long; the extension from Vernon to Kelowna 30 miles, and the extension from Vernon to Lumby, 14 miles. It is being laid out as a steam line. Prospective contractors are inspecting the ground with a view of tendering, as soon as the

location is completed, which we are officially advised should be within a few weeks.

We are officially advised that no plans have yet been decided on for a comprehensive lay-out of the terminal yards at Port Mann, B.C. The Northern Construction Co. is grading and laying out such part of the yard as will be required in the immediate future. Meantime the rest of the lay-out is under consideration.

Recent press reports stated that the C.N.P. Ry. had acquired a railway running between New Westminster and Hazelmere, which would give a through line to New Westminster via Port Mann. We are advised, in this connection, that the company is negotiating with the Great Northern Ry. for acquiring the right of way of the old New Westminster Southern Ry. between Port Mann and Port Kells.

H. K. Wicksteed, Chief Engineer of Surveys for Mackenzie, Mann & Co., arrived in Vancouver, July 30, and spent nearly three weeks inspecting the lines under construction, and in going over plans for the company's extensive development projects in the vicinity.

Press reports state that a contract has been let to Rigby and Marsden, Vancouver, for the building of eight steel bridges on the line east of Yale, B.C.

Vancouver Island.—Tenders are under consideration for building a further section of 40 miles of the line on Vancouver Island. The section extends from mileage 100, west of Cowichan Lake, to the Alberin canal, and is styled Division D. The work includes clearing, grubbing, grading, fencing, and the building of bridges, trestles, culverts and masonry. It is to be completed within a year from the signing of the contract.

James J. Hill on the History of the Great Northern Railway.

On retiring recently from the chairmanship of the board, Great Northern Ry., J. J. Hill issued a circular to the shareholders, which contains a lot of interesting matter about northwestern railway development. Following are extracts:

Nearly 40 years ago the thought of a possible railway enterprise in the northwest began to occupy my mind. It was born of experience in northwestern transportation problems that had occupied most of my early business life, of faith in the productive powers and material resources of this part of the country, and of railroad conditions at that time. The feverish activity in securing railway concessions in land and cash that marked the sixth decade of the last century had been followed by collapse. Doomed as these enterprises were to ultimate failure by their lack of commercial foundation and financial soundness, they were suddenly wrecked by the panic of 1873. Aside from the Northern Pacific property, the lines in Minnesota most important and available if converted into real assets for the development of the northwest were the fragments of the old St. Paul & Pacific Co. Following the panic of 1873 these were in the hands of a receiver. The holders of their securities in Holland were more anxious to recover what they could from the wreck than to put more money into its completion and improvements that must be made if the properties were to continue to be operated at all. Their value lay to some extent in what was left of a land grant, which would be valuable as soon as the country should be opened, but chiefly in the possibilities of traffic from the millions of productive acres in the northwest to be opened to settlement by transportation facilities. Yet so great seemed the task and so uncertain the reward, in the general opinion ,that any plan of acquiring and reorganizing the property was regarded as visionary in those days by most holders of capital and most men of affairs.

After long and close study of the situation the slender beginning was made on which we risked our all. Failure would be immediate and final disaster. My associates were Geo. Stephen, now Lord Mount Stephen, Donald A. Smith, now Lord Strathcona, and N. W. Kittson. We bought the defaulted bonds of these properties from the Dutch holders. The agreement with the Dutch committee was executed March 13, 1878, and practically all outstanding indebtedness was subsequently secured. The mortgages were afterwards foreclosed and the property was bought in. For those days it seemed a formidable financial undertaking. The stock of these companies aggregated $6,500,000, and their bonded indebtedness with past due interest nearly $33,000,000, aside from floating obligations. These had to be purchased at prices above those for which they had previously been offered in the open market. The total capitalization and indebtedness at that time of the companies taken over was approximately $44,000,000.

The property secured consisted of completed lines from St. Paul via St. Anthony to Melrose, 104 miles, and from Minneapolis to Breckenridge, 207 miles; and of two projected lines, one from Sauk Rapids to Brainerd and one from Melrose to the Red River at St. Vincent on the international boundary line. On these latter some grading had been done and about 75 miles of track had been laid. There were gaps between Melrose and Barnesville, Crookston and St. Vincent, that must be filled quickly. In themselves, had it not been for the promise of the future, these were scattered tracks in a country just being settled, out of which to construct a railway system and on which to base the financing of their purchase and development.

We advanced the money to build the Red River Valley Rd., 14 miles of track from Crookston to Fisher's Landing, on the Red River, making a through route by steamboat from that point to Winnipeg. While negotiations were pending and also after they were concluded, but before possession could be secured through the foreclosure of mortgages, an immense amount of work had to be done. The extension from Melrose to Barnesville must be pushed, and was carried 33 miles, as far as Alexandria; and 90 miles were built in the Red River Valley to reach the Canadian boundary. The former was necessary to save the land grant, whose time limit, already extended, was about to expire. The latter was in addition to connect with a railway projected by the Canadian government from Winnipeg south. As the properties were still in the hands of a receiver, an order had to be obtained from the court for the completion of the work in Minnesota with funds furnished by us. Money had to be raised to build these lines and to furnish equipment necessary for their operation.

In May, 1879, the St. Paul, Minneapolis & Manitoba Ry. Co. was organized to take over all these properties, whose bonds had been largely purchased, whose stocks had been secured and whose assets were to be bought in under foreclosure. It had an authorized capital stock of $15,000,000, limited by its charter to $20,000,000, and made two mortgages of $8,000,000 each. Geo. Stephen was made first President of the company, R. B. Angus, Vice President, and I was chosen General Manager. This placed upon me the practical conduct of the enterprise from its formal inception.

The lines of the new system turned over to our possession on June 23, 1879, comprised 667 miles, of which 565 were completed and 102 under construction. From the beginning its business fulfilled the expectations of its founders. The annual report for 1880 showed an increase in earning of 54% and land sales amounting to $1,200,000. And now began the long task of building up the country. No sooner was a mile of road finished than the need of building other miles became apparent. Before Minnesota had filled up, the tide of immigration was passing even the famous Red River Valley country and flowing into Dakota. By 1880 it had become necessary to add a line down the Dakota side of the Red River, to plan for many extensions and branches, and two local companies, building lines in western Minnesota, were purchased.

Only a detailed history of the railroad could follow step by step the progress of track extension and the financial arrangements by which capital was furnished for these constant and always growing demands from this time on. In a brief review such as this, I can call attention only to what may fairly be called points of historic interest in the growth of what is now the Great Northern System. One of these was the provision of an eastern outlet by way of the Great Lakes. An interest was obtained in the St. Paul & Duluth Rd. in 1881. This, with the building of the link from St. Cloud to Hinckley, gave the necessary access to the Great Lakes, until the organization of the Eastern Minnesota in 1887 as a subsidiary company furnished a permanent outlet and terminals. I was made Vice President of the company Nov. 1, 1881, and on Aug. 21, 1882, succeeded to the Presidency, a position whose duties I was to discharge for a quarter of a century. J. S. Kennedy, who had joined our party after the organization of the company, was elected Vice President. At no time have I accepted any salary for my services as President or Chairman of the Board of Directors, since I have felt that I was sufficiently compensated by the increase in the value of the property in which my interest has always been large.

Business now grew more and more rapidly, the Northern Pacific was about completed and the Canadian Pacific was building toward the Coast. The St. Paul & Pacific Rd. was originally, as its name implied, intended as a transcontinental line. The route to be traversed was rich in fertile soils and abundance of mineral and forest resources. Quite as important, perhaps, was the fact that it admitted of the construction of a line with grades so low and curves so moderate as to make possible cheaper overland carriage than had ever been previously considered. Montana was beginning a large development of her own; while the active growth of the North Pacific Coast, though only in embryo, could be foreseen. In 1887 the lines of the Manitoba were extended to a connection with the Montana Central. This latter company had been incorporated early in Jan., 1886. Realizing the importance of occupying a field in Montana which was essential to the future transcontinental line, valuable in itself and one which others were already preparing to secure, we had, with some friends, organized the company under the laws of Montana. Work was begun at once, the surveys being made in the coldest winter weather. Construction was rushed. The track was completed to Helena in 1887 and to Butte by the middle of 1888. A branch to Sand Coulee opened up the coal mines of that region, furnishing fuel for use on Montana and Dakota divisions of the line, and for the development of the mining interests in Montana which had been obliged up to that time to bring in their coal from Wyoming. The work of extending the Manitoba line to connect with the Mon-

tana Central launched this company upon the most active period of construction ever known in this country.

Five hundred continuous miles were graded between April and Sept., 1887, and by Nov. 18, 643 miles of track had been laid, an average rate of construction of 3¼ miles for each working day. But this activity on the main line to the west was only one item in the extension programme. Between 1882 and 1888 the stone arch bridge and terminals in Minneapolis were completed; the Dakota line down the Red River was finished to a connection with the Canadian Pacific; the Casselton branch was purchased; a line was built from Willmar to Sioux Falls, and afterward extended to Yankton; some railways in South Dakota were bought; the Montana Central was taken over at cost, and an elevator and large terminals at West Superior were arranged for. In 1889 the line to Duluth and West Superior was completed, giving terminals and dock accommodations which today are not surpassed anywhere in the country. The total milcage operated had now increased to 3,030 miles. The company had also begun to operate its own steamships, through the Northern Steamship Company, on the Great Lakes. These boats, which began to run in 1888 and 1889, not only afforded greater dispatch in the carriage of grain and flour from the head of the lakes to Buffalo and other lake ports, but they put the railway independent of other lake lines. It was thus enabled to protect its patrons, and to prevent its reductions in rates from being absorbed by increases made by the lines east of its lake terminals.

In 1889 the Great Northern Ry. Co. was organized, to bind into a compact whole the various properties that had grown too large for the charter limitations of the old Manitoba. It leased all the property of the latter company, and was prepared to finance the undertakings about to be completed or in contemplation. By 1893 the line was opened through to Puget Sound. In the next five or six years many improvements were made by relaying track with heavier rails and by changes in equipment and large additions thereto. Branches and feeders were built to round out the system. In 1897 a more direct line from the head of the lakes to the west was created by purchase and construction that completed a road across northern Minnesota to a connection with the main line. The taking over of the Seattle & Montana which, like the Montana Central, had been built by us to assure adequate terminals on the Pacific Coast and to enable construction to go forward from both ends of the line at once, extended the system from Seattle to Vancouver, British Columbia.

In 1901 the company decided to open negotiations for the joint purchase of the Chicago, Burlington & Quincy System by the Great Northern and the Northern Pacific. These were carried to a successful completion by the issue of joint collateral trust bonds to the amount of $215,154,000, secured by the stock of the company acquired. Time has confirmed the wisdom of this act, by which through traffic arrangements have been simplified, and the public has gained much by the drawing together of markets and the quick and cheap distribution of products between Chicago, St. Louis and the Pacific Coast.

It was planned, through the formation of the Northern Securities Company, to form a holding concern for the control of these three great porperties. The purpose was to prevent a dispersion of securities that might follow where large amounts were held by men well advanced in years, and so to secure the properties against speculative raids by interests at best not directly concerned in the progress of the country served by these lines. This was declared illegal, under the Sherman anti-trust law, by a divided court, upon suit by the United States government, and the Northern Securities Company was dissolved.

In 1907 the subsidiary companies controlled by the Great Northern, including fourteen railway companies operated as a part of it, were purchased and incorporated into the Great Northern System, making of these related parts one homogeneous whole. In the same year I resigned the presidency of the system, and became Chairman of the Board of Directors,—the office that I lay down to-day. The work of extension and improvement has gone forward steadily. By the construction of the Spokane, Portland & Seattle line, along the north bank of the Columbia River, the Great Northern and the Northern Pacific obtained jointly entry over their own tracks into Portland. Lines are now being constructed through eastern Oregon that will open up a large and productive country. In 1909 the Burlington obtained control of the Colorado & Southern; so that the Great Northern covers, directly or over the tracks of allied lines, a territory reaching from Chicago, St. Paul, Minneapolis, Duluth and Superior on the east to Puget Sound and Portland on the west, and from Galveston to Vancouver, British Columbia. The Great Northern System has grown from less than 400 miles of the original purchase to 7,407 miles.

Not lightly may the relation between a man and the work in which he has had a vital part be set aside. My personal interest in the Great Northern remains as keen as ever. The financial interest of myself and family in it is larger now than it ever was at any time in the past, and any change would more probably increase than diminish it. While I shall be no longer the responsible head of the Great Northern, I will contribute henceforth such counsel and advice as may seem best from one no longer holding the throttle valve or controlling the brake.

Most men who have really lived have had, in some shape, their great adventure. This railway is mine. I feel that a labor and a service so called into being, touching at so many points the lives of so many millions, with its ability to serve the country, and its firmly established credit and reputation, will be the best evidence of its permanent value and that it no longer depends upon the life or labor of any single individual.

Railway Track Labor.

By E. J. McVeigh, Storekeeper, Grand Trunk Railway, Ottawa.

When the man who handled track labor 20 years ago stops to consider, and compare, the conditions then existing with the conditions of today, and hopes for the future, he must feel that his day for doing things has gone by, never to return. Moreover, it is hard to teach old dogs new tricks, and many of the older roadmasters are really more pessimistic than they need be. In this matter we are, as in all other matters, in a state of evolution, and we must conform, or be left on one side, while younger men, men of the hour, carry on the work under the conditions they find, as the older men did in their day and generation. That conditions are different and more difficult is perfectly true, but conditions have changed in all lines of human effort. Life has become more strenuous all along the line, and where brawn fails us, we must use our brain to make life possible.

That we have done this is seen clearly on all sides, and nowhere more than in the construction and maintenance of railway permanent way. Our machinery for loading, unloading and spreading ballast and hadling material shows this. In the portion of our country where the fall of snow is heavy we handled it by hand in the past when hands were many and willing; today we have other means to do it better with fewer hands, and it will be so to the end, which is not yet, and in the meantime we must live in the present and prepare for the future.

If we glance back over the railway history of this continent we will learn that when we wanted men for our track work they were recruited largely from the native stock, farmers' sons, the most intelligent and best trained labor the world has ever seen. In the early days of railway laboring, work off the farms was not so plentiful as it became later, so that these young men were more willing to take up track work. And they, with their natural intelligence and ambition, soon became expert in their work and proud of it. Many spent their lives at it, and it is from this number that our present day roadmasters and supervisors largely came.

But time flies, and as our country advanced and opened up, opportunity for this class of men increased, the railways did not fully realize the position, and did not increase wages fast enough to hold them. Whether they could in any case have held them in such a country as ours is a question, but the fact is they did not, so that today we are confronted with a fact and a condition. It is with the condition created by the fact that we must deal, now and in the future. Go ahead we must, but we may, if we will, gather a few lessons from the past that may be of assistance in the future.

The questions have been asked, how do the railways now obtain labor, for, first, section gangs; second, extra gangs. The answer is that they obtain such labor in any way they can, and not fully recognizing the present condition of having to deal with ignorant foreign labor, few arrangements have been made, so far, to make and keep laborers satisfied and hold them. Another reason for this is that such labor is largely wanting, and no arrangements we have made will hold it for long.

It is indeed difficult to get a fair day's work out of our present track men. Even when they are willing to work hard, their ignorance and inability to understand what is said to them makes it next to impossible to get satisfactory results. Our only salvation is that we still have a few of the native stock left to lead and direct. The methods adopted to increase the amount of work accomplished will vary according to the men and conditions. There can be no rule laid down in such a matter, and I have yet to see a failure through treating men considerately. One man may do considerable driving and accomplish much without losing his men or having them go sour on him, while another may do just the reverse. But one thing we can never afford to neglect is the square deal. Man from infancy resents injustice. It may be true that in the older countries men have been forced to accept a greater measure of injustice than do men on this continent, but even then they resented it, though unable to make their resentment felt. In this country, with a choice of where and for whom they shall work, they can, and do, make their resentment effective. So that even if on no higher grounds than that of expediency, let us be fair and do justice only, in our dealings with our laborers. Not only do this personally, but see to it so far as in us lies that others do the same. The fact that many of these men will not make a fair return for fair treatment does not lessen our obligation in the matter. You owe it to yourself if not to your men, but you do owe it to them: and besides it pays, believe me, it pays well. You may not see it at once, not today nor tomorrow but our railways are not here for today nor tomorrow only, and a reputation for fair treatment or dealing is a never failing source of strength to the railway company as well as to the individual. We have all seen

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or heard of trouble with foreign labor; do not be too hasty in condemning the men in such cases. In the light of my own experience I would accept no man's word as to where the fault lies until I had heard both sides. Our railway executive are always desirous of dealing fairly with their men, but there are many heads and hands between the executive and the man with the shovel—the contractor with his "drivers," storekeepers and timekeepers; the roadmasters with their assitants. How can our executive officers be sure that these men in excess of zeal. or greed, have not gone beyond what is fair and just? And when trouble comes it is their side of the case that is heard, and the blame put on the men.

There are several causes that lead to trouble with foreign labor. One of these is, of course, the natural foolishness of the human animal. and that is not confined to any breed or nation. The other might be shortly expressed as unfair treatment; to divide this into its several phases it would read, poor food and sleeping quarters, excessive charges for supplies, "shaving" of time, brutal treatment by foremen and indifference on the part of higher officers.

Shortly after I had become interested in this matter I had an experience that was amusing and enlightening at the same time. I had given a certain man a contract to cut and pile on the right of way some thousands of cords of hard wood. He could not secure good woodsmen and picked up a gang of Italians to do the work. As we required the wood for steamboat firing, the roughness of the work was of no consequence, so we let him go ahead. When they had got a fair amount cut and piled I dropped off a train and measured it up for a 30 day estimate. I did not see any of the men at this time, but it was necessary that the wood I had measured should be marked to prevent confusion, and I left a stamp hammer at the station with instructions for the section foreman to go up next morning and stamp the piles. About noon the following day I received a telegram from the foreman to the effect that he had attempted to stamp the wood, but he Italians had swarmed out of the bush and chased him two miles, and would have certainly killed him had he not been a good runner.

I wired him to meet me the next morning, and when I stepped off the train he asked me how many soldiers I had brought with me. I told him I had no soldiers, but he and I would go up and stamp the wood. He offered me the hammer and promised to pick up as many pieces of me as he could find after the gang had got through playing with me; but to go back there with one man, and he only five foot seven, he would not. He was a big Scotchman, and we had considerable of an argument, but when I told him I would offer myself as a sacrifice and give him a chance to make another run, he came along.

The roadway used by the teams bringing out the wood was west of the wood piles, and the piles stretched a quarter of a mile east in the direction of the station. I took my stand on the track opposite the roadway, while Sandy got ready either to work or run, at the east end of the longest pile. I signalled him to go ahead, and the sound of the hammer on the beech wood echoed through the forest. Wow! He had not struck six blows when hell broke out for noon, back in the cutting, and out came the Italians. One fellow had a gun, some had knives, others brought their chopping axes, and one chap had a long crosscut saw that kept catching in the brush and throwing him down, but he held on to it as his only hope. I have often listened to a pack of wolves, but that crowd could give the largest pack I ever heard cards and spades and then win in a walk. It was funny to me because I knew, but it was not funny to Sandy. I glanced at him, and he stood in the centre of the track ready to light out for home and safety. Then the gang poured out through the opening in the fence.

But alas, what a come down! They saw me standing there laughing at them, and recognized in me the authority, so instead of murder and sudden death, there were abject apologies and attempts at explanation. But I needed none. I was the one in fault; they did not understand, and I did. I had no right to send a strange man there to stamp their wood without explaining to them. This may not seem to have a bearing on the question we are considering, but I think it has. We must make up our minds that in future we must expect to do the greater part of our track work with foreign labor. Personally I favor the Swede, and the Italian from the north of Italy. But we must do something to keep these men with us. To begin with, we should go systematically to work to secure the men we want for our sections from the better class of the people I have named, and do it now while we have a few of the native stock left to train them. Then we should help and encourage them to make homes for themselves. Keep our section force down to a reasonable number and make that number permanent. The constant change in number and personnel of our section force has a demoralizing effect. Place on the shoulders of our small permanent force the full responsibility for general maintenance, but send an extra gang over each section in the spring to put in ties and line track. If new ballast is put out, have this gang attend to it also. Rush this clas of work through to a finish, and then lay off the extra gang.

Railway men everywhere are considering this very important matter carefully, and I am of the opinion that the plan I have tried to outline above is the real solution of the problem. We have been trying to go ahead in a catch as catch can manner, conditions beoming worse each year. It is time we adopted a system and followed it. Our section forces are discouraged and demoralized. If a crew manages to get ahead with the work they are taken off their section to help the fellow who, for some reason is behind. We allow an extra man, or two, if we can get them, to help with the ties. Even then it takes all summer to get a reasonable number under the track, while all other work must be neglected. The small section force can no longer line the heavy track, and crews must be doubled up for that purpose. These things are all bad, and we should get away from them.

It will be claimed that these changes will cost more money than the railway can afford to pay. But we must first remember that the work must be done whether we can afford it or not. And then I am not sure that it would cost more than now. Suppose we have been in the habit of putting two men on each section of a district of 25 sections to help out during April, May, June and July, and it takes the crews so strengthened all of this time to get in the ties, and then they cannot line or do any other work. Now make up two extra gangs of 25 men to do nothing but put in ties and line. Would not they do the whole district in less than four months, while all other work should be kept up-to-date by the regular section crew, who would neither be increased in the spring nor decreased in the fall?

We must secure permanence and contentment in our section force. It is not good policy to reward a man and crew for extra effort by taking him off his section to help some other fellow.—Railway Engineering and Maintenance of Way.

The Algoma Central and Hudson Bay Navigation Co.'s steamboat Leafield went ashore, Aug. 17, near Bagster's lighthouse, Georgian Bay.

Mainly About Transportation People.

MRS. ROBERT PATTERSON, wife of the Master Mechanic, G.T.R., Stratford, Ont., died July 26.

P. SMITH, chief clerk to the Auditor of Passenger Receipts, G.T.R., died in the Homeopathic Hospital, Montreal, Aug. 7.

Mrs. Pariseau, wife of L. S. PARISEAU, of the Department of Railways engineering staff, died at Montreal, July 28.

E. A. McGUINNESS, C.P.R. station ticket agent, Brandon, Man., was married at Souris, Man., Aug. 7, to Miss E. G. Dolmage.

B. B. KELLIHER, Chief Engineer, G.T. Pacific Ry., Winnipeg, left Vancouver, Aug. 6, for a holiday trip to the United States.

F. McKINNON, baggage master, Intercolonial Ry., at Norton, N.B., was run over and killed by a train in the yard, Aug. 10.

W. F. RYAN was presented with a case of cutlery, July 27, by the C.P.R. telegraph's staff at Montreal, on leaving the service.

G. U. RYLEY, Land Commissioner, Grand Trunk Pacific Ry., Winnipeg, is convalescing after an operation for appendicitis.

Mrs. Leonard, mother of R. W. LEONARD, Commissioner, National Transcontinental Ry., died at Brantford, Ont., July 27, aged 87.

T. HORNER, General Roadmaster, Northern Division G.T.R., Allandale, Ont., left, July 29, for a six weeks' trip to the Pacific coast.

R. H. SPERLING, General Manager, British Columbia Electric Ry., and Mrs. Sperling left Vancouver, Aug. 8, for London, Eng., on a lengthened trip.

A. F. WEBSTER, steamship ticket agent, Toronto, is one of the provisional directors of the Union Brick Co., which has just been incorporated there.

H. B. SAMPLE, Terminal Agent, Intercolonial Ry., Bonaventure station, Montreal, for the past 13 years, died there, Aug. 9, after a lengthened illness.

A. A. Andrews, of Winnipeg, Man., who died in St. Luke's Hospital, Chicago, Ill., Aug. 2, was father of P. C. ANDREWS, of Mackenzie, Mann and Co.'s office.

Sir HENRY M. PELLATT, director, Toronto Ry., Toronto, has been appointed by the King to be a Knight of Grace of the Order of the Hospital of St. John of Jerusalem.

LORD STRATHCONA celebrated his ninety-second birthday, Aug. 7. He is enjoying good health, having apparently completely recovered from his recent indisposition.

A. PRICE, General Superintendent, Alberta Division, C.P.R., Calgary, returned to duty, Aug. 15, after spending a month's vacation in the Columbia valley and on the Pacific coast.

MISS B. M. BRADY, daughter of F. P. Brady, General Superintendent, Canadian Government Railways, was married at Moncton, N.B., Aug. 14, to E. H. Parmelee, of North Bay, Ont.

D. SIMPSON, who had been in the employ of the G.T.R. for 50 years, for 41 of which he has been a locomotive driver running out of Montreal west, retired from active service, July 31.

SIR WILLIAM MACKENZIE returned to Toronto from England, Aug. 1, accompanied by M. NORDEGG, one of the directors of Brazeau Collieries Ltd., with which Sir William is associated.

T. P. SHONTS, President, Toledo, St. Louis and Western Rd., New York, it is reported, will resign shortly, so that he may devote more time to the work of the Interborough Rapid Transit Co.

J. W. FARRELL, Trainmaster, Districts 1 and 2, Eastern Division, G.T.R., Island Pond, Vt., who was recently granted extended leave of absence, on account of ill health, has resumed duty, as Trainmaster, District 2.

A. BUTZE, formerly General Purchasing Agent, Grand Trunk and Grand Trunk Pacific Railways, has been appointed Assistant Secretary and Purchasing Agent, National Steel Car Co., which is building a plant at Hamilton, Ont.

G. H. HAM, Chief of the Publicity Department, C.P.R., Montreal, was recently presented with a gold cigarette case, suitably engraved, by a number of British manufacturers, on the completion of a tour through the Dominion.

MISS FLORENCE MILLS BERTRAM, only daughter of Alex. Bertram, of John Bertram & Sons Co. Ltd., Dundas, Ont., is to be married early in the autumn to F. J. Sharp, son of the Rev. J. Sharp, of Bridgewater, N.S.

MRS. W. E. DUPEROW, wife of the General Agent, Passenger Department, G.T. Pacific Ry., Vancouver, has been visiting relatives and friends in Toronto and Stratford, Ont., after an absence of over three years.

P296 R. Armstrong,
Superintendent, District 3, Saskatchewan Division, Canadian Pacific Ry., Saskatoon.

HUGH McDONALD, Freight Claims Agent, Canadian Northern Quebec Ry., and Quebec and Lake St. John Ry., Quebec, was married, Aug. 6, to Miss B. Neville, after which they left for a trip to New York and New Jersey.

J. W. LEONARD, Assistant to Vice President McNicoll, C.P.R., and M. N. TODD, President, Galt, Preston and Hespeler St. Ry., sailed from Montreal, Aug. 17, on the s.s. Lake Manitoba, intending to return about the middle of October.

W. C. BROWN, President, New York Central and Hudson River Rd., left Spokane, Wash., for Alaska, Aug. 9, and on returning will land at Vancouver, whence he will return to New York via the C.P.R., spending some time in the Rocky Mountains.

C. H. RUST, M. Can. Soc. C.E., City Engineer, Victoria, B.C., and formerly City Engineer, Toronto, has been elected First Vice President, American Society of Civil Engineers. He was President, Canadian Society of Civil Engineers for the year 1911-12.

N. L. RAND, who died at Moncton, N.B., Aug. 5, entered the European and North American Ry. service in 1859, and finally retired from railway work in 1909, at which time he was Master Mechanic, Intercolonial Ry., with jurisdiction east of Campbellton, N.B.

F. W. MORSE, formerly Vice President and General Manager, Grand Trunk Pacific Ry., has resigned the position of Vice President and General Manager, Chicago and Alton Rd., Chicago, Ill., and the duties have been assumed by the President, B. A. Worthington.

R. J. WICKSTEED, LL.D., barrister, Ottawa, who died there recently, left his estate, valued at over $58,000, to McGill University, Montreal. He was a brother of H. K. Wicksteed, M. Can. Soc. C. E., Chief Engineer of Location, Mackenzie, Mann and Co., Ltd., Toronto.

P. McQUAID, whose appointment as Master Mechanic, Prince Edward Island Ry., Charlottetown, P.E.I., was announced in a recent issue, entered P.E.I. Ry. service, Apr. 16, 1888, as machinist, and was appointed Roundhouse Foreman, Jan. 1, 1905, and Master Mechanic, June 1, 1912.

W. O. HOUSTON, who has been appointed Division Engineer, Michigan Central Rd., St. Thomas, Ont., is a graduate of the University of Michigan. He was at one time Chief Engineer, New Orleans Great Northern Rd., and has been, for the past year, an assistant engineer, M.C.R.

W. E. HAYWARD, whose appointment as Locomotive Foreman, C.P.R., North Bend, B.C., was announced in our last issue, entered C.P.R. service, June 20, 1911, since when he has been, to June 26, 1912, machinist at Revelstoke, B.C.; June 26 to July 1, 1912, Shop Foreman at Kamloops, B.C.

Mrs. Scott, who died at SIR WILLIAM WHYTE'S house, Winnipeg, Aug. 18, aged 96, was the mother of Lady Whyte. Her late husband, Adam Scott, was engaged in railway work in Toronto several years ago, and was killed on the old Northern Ry. Her son, B. W. Scott, is Freight Agent, G.T.R., Montreal.

W. D. WASHBURN, who died at Minneapolis, Minn., July 29, was, from 1861 to 1865, Surveyor General of Minnesota, and was the promoter, and for many years President of the Minneapolis and St. Louis Rd., and the Minneapolis, St. Paul and Sault Ste. Marie Ry., the latter now being controlled by the C.P.R.

H. McEWEN, whose appointment as Superintendent, Prince Edward Island Ry., Charlottetown, P.E.I., was announced in a recent issue, entered P.E.I. Ry. service, May 14, 1875, as station master at Mount Stewart, and was appointed dispatcher, Feb., 1892; Chief Dispatcher, May 1899, and Superintendent, May 1, 1912.

A. W. SMITHERS, Chairman of the Board, G.T.R., arrived in Canada, from England, Aug. 4, accompanied by his son and daughter. E. J. Chamberlin, President, G.T.R., and G. T. Pacific Ry., joined the party at Montreal, which left for a tour of the G.T.R. to Chicago, whence they proceed to Winnipeg to go over the G. T. P. Ry.

W. PHILLIPS, European Traffic Manager, Canadian Northern Ry., who has been busily engaged since his arrival in England recently, in reorganizing the department, is about to make a tour of the European agencies, accompanied by a representative of P. A. Van Es & Co., of Rotterdam, the company's General Agents on the continent.

J. M. BANNERMAN, who recently resigned from the Canadian Northern Ry. freight department, Winnipeg, on his ap-

pointment as station master, Fort Garry union station, which latter position he also resigned to become inspector, Canadian Northern Transfer Co., Winnipeg, was, on July 23, presented with a suite of furniture by the C.N.R. freight department staff.

Miss H. M. Bury, eldest daughter of GEORGE BURY, Vice President and General Manager, Western Lines, C.P.R., was married at Winnipeg, Aug. 17, to H. R. Drummond-Hay. The bride and bridegroom travelled to Montreal in the C.P.R. private car Manitoba, and sailed, Aug. 21, on the s.s. Royal George to spend about two months in Europe. They will live in Winnipeg.

S. P. PORTER, who is reported to have been appointed Executive Agent, Grand Trunk Pacific Ry., Regina, Sask., was born in Somersetshire, Eng., in 1870, and came to Canada in 1886. He was engaged in farming for a few years, and entered railway service in 1889 as trainman on the C.P.R. He was appointed homestead inspector for the Dominion Government in 1901, and in 1908 was appointed Deputy Minister of Railways, Telegraphs and Telephones for Saskatchewan.

SIR MAURICE FITZMAURICE, M., Inst. C. E., M. Can. Soc. C. E., recently resigned the position of Chief Engineer of the London County Council, Eng., to take up private practice. He was a member of the first board of engineers appointed by the Dominion Government in connection with the designing of the Quebec bridge, now under construction. One of the U. S. technical papers states that he was knighted by King George IV., who has been dead for something over 80 years.

F. H. McGUIGAN, formerly Fourth Vice President, G.T.R., and later Vice President, Great Northern Ry. (U.S.), but who has for several years carried on a general engineering and contracting business in Toronto and Montreal, was reported to be in a serious condition of health, Aug. 13, when the Montreal board of control intimated that he was compelled to abandon his contract for the construction of a filtration plant. He suffered a breakdown in July, and has been advised to take a complete rest for some time.

FOLEY BROS. & LARSEN, railway contractors, for many years carried on an extensive provision and supply business, mainly for the purpose of supplying railway construction camps. Some years ago the Winnipeg business was closed out, and it was reported, Aug. 12, that the Edmonton business had been sold. The firm originally consisted of the Foley Brothers; subsequently it was Foley Bros. and Larsen, and at a more recent date P. Welch and J. W. Stewart became associated with it, and the firm name is now Foley, Welch and Stewart.

G. C. RANSOM, who has been appointed Chairman Canadian Freight Association Eastern Lines, was born at Victor, N.Y., August 20, 1864, and entered transportation service in 1887, his record being: June, 1887 to October, 1898, with the Blue Line, Rochester, N. Y.; October, 1898 to October, 1899, New York Central Lines, Buffalo, N. Y.; October, 1899 to April, 1906, at Montreal, Chief Clerk, General Freight Department, Michigan Central Road, Detroit, Mich.; April, 1906 to January 31, 1907, Chief Clerk, same department; February 1, 1907 to August 15, 1912, District Freight Agent, New York Central Lines, Buffalo, N. Y.

O. MASSE, whose appointment as acting Chief Dispatcher, districts 4 and 5, eastern division, G.T.R., Montreal, was announced in our last issue, was born at Coteau Jct., Que., Nov. 6, 1884, and entered G.T.R. service Nov. 1, 1901, since when he has been, to Feb. 25, 1903, night freight clerk; Feb. 25, to Dec. 2, 1903, night operator; Dec. 2, 1903, to June 21, 1904, day operator; June 21, 1904 to May 30, 1905, day operator and supervisor of crews; May 30 to Oct. 15, 1905, operator in dispatchers' office; Oct. 15, 1905, to Oct. 14, 1911, dispatcher in various districts; Oct. 14. 1911, to July 1, 1912, Night Chief Dispatcher, Montreal.

J. V. DILLABOUGH, who is reported to have been appointed office engineer on the Dominion Government railway to Hudson Bay, commenced his railway work in 1905, as Resident Engineer, District D, National Transcontinental Ry., being transferred to District F, with headquarters at St. Boniface, Man., in 1907. While there, the chief works with which he was connected were the design and layout of the Transcona shops and yards, and the construction of the double track bascule bridge over the Red River, carrying the track to the Fort Garry station. He was transferred to office engineer, District F, Dec. 1911.

R. R. NEILD, who recently resigned the position of General Locomotive Foreman, C.P.R., Winnipeg, on his appointment as General Superintendent, Manitoba Bridge and Iron Works, there, entered C.P.R. service in 1900, and has held the positions of Foreman, machine shop, General Foreman, erecting shop, and was the first official to take charge of the locomotive department of the Angus shops, Montreal, supervised the organization there previous to the removal of the staff from the old plant on Delorimier Ave., and started the piece work system. He was appointed General Locomotive Foreman at Winnipeg, Feb. 1908.

ERNEST ALEXANDER, who has been appointed Assistant Secretary, C.P.R., was born in Yorkshire, Eng., Dec. 8, 1862, and commenced railway work in 1882, as private secretary to the Superintendent, Southern Division, G.T.R., Hamilton, Ont., remaining in that position until the abolition of the company's general offices there, early in 1893. On Mar. 1, 1893, he entered C.P.R. service as secretary to the President, Sir William Van Horne, and on Sir William's retirement from the presidency in 1899, he remained in the same capacity with Sir Thomas Shaughnessy, until July 1908, when he was appointed Assistant Treasurer, C.P.R., Montreal.

J. H. BROOKS, who has been appointed District Master Mechanic, District 2, Lake Superior Division, C.P.R., White River, Ont., was born in Lancashire, Eng., Aug. 6, 1867, and commenced railway work there, as fireman on the London and North Western Ry. He came to Canada in 1884, and entered C.P.R. service as stationary fireman in the car shops at Perth, Ont., remaining there until 1885, when he left railway service, returning to C.P.R. service Oct. 1887, since when he has been, to Feb. 1888, fireman at Schreiber, Ont.; Feb. 1888 to 1900, fireman at North Bay, Ont.; 1900 to Oct. 1911, locomotive driver, North Bay, Ont.; Oct. 1911 to July 1, 1912, acting District Master Mechanic, North Bay, Ont.

J. H. JOHNSTON, whose appointment as Master of Bridges and Buildings, Eastern Division, G.T.R., Montreal, was mentioned in our last issue, was born at Uxbridge, Ont., Apr. 22, 1866, and entered railway service, Oct., 1886, since when he has been, to Aug., 1898, in various positions in the engineering department, Midland Ry., now part of the G.T.R.; Aug., 1898, to Nov., 1903, Building Foreman, Northern Division, G.T.R.; Nov., 1903, to Sept. 1904, Building Inspector, Northern Division, G.T.R.; Sept., 1904, to Aug., 1905, Building Inspector, Middle Division, G.T.R.; Aug., 1905, to Jan., 1906, General Foreman, Middle Division, G.T.R., London, Ont.; Jan., 1906, to July, 1912, Master of Bridges and Buildings, Ottawa Division, G.T.R.

J. A. GLASFORD, whose appointment as Terminals Manager, Winnipeg Joint Terminals, was announced in a recent issue, and whose portrait appeared in our last issue, was born at Cardinal, Ont., Apr. 27, 1863. He commenced railway work 25 years ago as telegraph operator, G.T.R., Montreal, and his record covers the positions of chief clerk to General Superintendent, Detroit, Mich.; General Yardmaster, Montreal; Trainmaster, Queen and Crescent Route, Chattanooga, Tenn.; Construction Superintendent, Norfolk and Southern Ry., Virginia; Superintendent, Northern Division, same road; in charge of handling freight and passenger traffic, C.P.R., Winnipeg; and, until the date of his present appointment, in a similar position at Toronto.

SIR PERCY GIROUARD, who recently resigned the position as Governor-General and Commander-in-Chief of the British East Africa Protectorate, to join the firm of Armstrong, Whitworth and Co., of Elswick and Manchester, Eng., was engaged on early construction work on the C.P.R., but since 1888 has been connected with military service with the Royal Engineers, during which time he organized the railway system at Woolwich Arsenal, Eng., and has been director of Sudan Railways; President, Egyptian Railway Board; Director of Railways in South Africa, during the early period of the war, and in the later stages, Commissioner of Railways for the Transvaal and the Orange River colony. He was born in Montreal in 1867, and is a son of the late Justice Girouard of the Supreme Court of Canada.

J. G. RUTHERFORD, V.S., who has been appointed Superintendent of Animal Husbandry, Department of Natural Resources, C.P.R., Calgary, Alta., was born at Mountain Bank, Peeblesshire, Scotland, Dec. 25, 1857, and was educated at the Glasgow High School, Ontario Agricultural College, and Ontario Veterinary College, receiving his degree with gold medal in 1879. He was elected an honorary associate of the Royal College of Veterinary Surgeons in 1908, and was in practice for several years in Canada, the United States and Mexico. He served during the North-West rebellion in 1885, receiving the medal and clasp, and has held many Provincial and Dominion appointments in a professional capacity, his last position being Chief Veterinarian for the Dominion. He was appointed a Commander of the Order of St. Michael and St. George in 1910.

F. E. WARD, who recently announced that he would, on Sept. 1, resign the position of General Manager, Chicago, Burlington and Quincy Rd. lines east of Missouri River, Chicago, Ill., was born July 29, 1867, and educated at McGill Model School, Montreal. He entered railway service Sept. 1881, since when he has been, to Nov. 1885, consecutively, apprentice, clerk and stenographer, G.T.R. Mechanical Department, Montreal; Jan. 1886 to Dec. 1887, secretary to Second Vice President, St. Paul, Minneapolis and Manitoba Ry., St. Paul, Minn.; Jan. 1888 to Nov. 1890, secretary and chief clerk to President and General Manager, Eastern Ry. of Minnesota; Jan. 1891 to July 1894, secretary to President, Great Northern Ry.; July 1894 to Feb. 1898, Assistant to President, same road; Mar. to Oct. 1898, General Superintendent, Montana Central Ry.; and subsequently General Superintendent, Great Northern Ry., St. Paul, Minn.

J. A. HEAMAN, who has been appointed Assistant to Chief Engineer, Grand Trunk Pacific Ry., Winnipeg, was born at Memphis, Tenn., June 3, 1874, and educated in the public schools and the Collegiate Institute, London, Ont., and McGill University, Montreal. He entered railway service, Apr. 1901, since when he has been, to Apr. 1902, instrumentman, G.T.R. double track construction; Apr. to Nov., 1902, Resident Engineer on construction, G.T.R.; Nov. 1902 to Nov. 1903, Resident Engineer on maintenance, G.T.R.; Nov. 1903 to May 1905, Assistant Engineer, G.T. Pacific Ry. location, east of Winnipeg; May 1905 to Nov. 1907, Assistant Engineer in charge of location and

construction, National Transcontinental Ry.; Nov. 1907 to Oct. 1908, Assistant District Engineer, National Transcontinental Ry.; Oct. 1908 to June 1910, Assistant District Engineer, G.T. Pacific Ry.; June 1910 to Apr. 1911, District Engineer, G.T. Pacific Ry.; Apr. 1911 to Apr. 1912, Office Engineer, G.T. Pacific Ry.; Apr. to Aug. 1, 1912, Division Engineer, G.T. Pacific Ry., Fitzhugh, Alta.

W. C. LANCASTER, who was recently appointed Electrical and Mechanical Engineer, Montreal Tunnel and Terminal Construction, Mackenzie, Mann and Co., is a member of the American Institute of Electrical Engineers, and also of the American Society of Mechanical Engineers, and took degrees in both of these branches of engineering at the Virginia University. His record covers the following positions:—Electrical engineer for a large street railway in the south, in charge of the electrical and mechanical work on the construction of the Pennsylvania Rd., Manhattan crosstown tunnels, and electrical and mechanical engineer of the following works:—Five-mile section of the Catskill aqueduct tunnel in New York City, part of the Erie barge canal near Lockport, N.Y., electric pumping and water works for Long Beach, electric pumping plant for Long Island Rd., a tunnel and water power development at Shelburne Falls, Mass., and the design of the electric power plant and sewage pumping station at Havana, Cuba. He also made the tests of the first New York Central Rd. electric locomotive.

G. C. MARTIN, whose appointment as General Freight and Passenger Agent, Toronto, Hamilton and Buffalo Ry., Hamilton, Ont., was announced in our last issue, was born at Creemore, Ont., Jan. 2, 1866, and commenced his railway career as assistant to agents, Northern and North Western Ry., at Creemore, New Lowell and Thornbury, Ont. He was engaged as an operator on construction, C.P.R., near Calgary, Alta., and at Hawke Lake, Ont., in 1883, and was appointed agent and operator. Northern and North Western Ry., Colwell Jct., Ont., in 1884, was moved to Caledon East, Ont., in 1886, to Cardwell Jct., Ont., in 1888, and to the city ticket office, London, Ont., in 1889. He entered C.P.R. service in 1891 as relieving agent, and after a varied experience in station work, station auditing, dispatching, etc., for several years, he left railway service for one year, returning to the service as clerk in the G.T.R. ticket office, union station, Toronto, and in 1897 was appointed chief clerk in the General Freight and Passenger Department, Toronto, Hamilton and Buffalo Ry., Hamilton, Ont., being promoted to Assistant General Freight and Passenger Agent, same road, Oct. 1909, which position he held to July 22, 1912, the date of his present appointment.

R. ARMSTRONG, who has been appointed Superintendent, District 3, Saskatchewan Division, C.P.R., Saskatoon, and whose portrait appears in this issue, was born at Kingston, Ont., Jan. 27, 1865, and commenced railway work, May 1886, since when he has been, to June 1894, operator, Kingston and Pembroke Ry.; June 1894 to 1896, in private business; June 9 to July 1896, operator C.P.R.; Weyburn, Sask.; July to Dec. 1, 1896, operator, C.P.R., Revelstoke, B.C.; Dec. 1, 1896, to Oct 1900, agent, C.P.R., Illecillewaet, B.C.; Oct. 1900 to Oct. 1901, dispatcher, C.P.R., Nelson, B.C.; Oct. 1901 to Apr. 1902, relieving agent, Nelson and Vancouver districts, C.P.R.; Apr. 1902 to Sept. 1906, yard agent, C.P.R., Vancouver, B.C.; Sept. 1906 to Aug. 1907, agent, C.P.R., Vancouver wharf; Aug. 1907 to May 1908, agent, C.P.R., Vancouver, B.C.; May 1908 to Jan. 1910, General Agent, C.P.R., Fort William, Ont.; Jan. 1910 to July 1912, Superintendent Fort William Terminals, C.P.R. On leaving Fort William recently, he was presented with a gold chain and locket, and a silver tea set and casket of silver for Mrs. Armstrong, by the local staff, and an address, a cut glass set, two chairs and a travelling bag, by members of the board of trade and the city council.

W. G. BROWNLEE, who has resigned the position of General Transportation Manager, G. T. R., Montreal, was born at Lawrenceville, Ill., September 9, 1858, and entered railway service in 1877, since when he has been, to 1879, operator, Ohio Mississippi Ry.; 1879 to 1881, operator and train dispatcher, Union Pacific Ry.; 1881 to 1884, train dispatcher and trainmaster, Denver and Rio Grande Road; 1884 to 1887, train dispatcher, Union Pacific Road, Laramie, Wyo.; 1887 to 1889, train dispatcher, same road, St. Louis, Mo.; 1892 to February, 1900, Division Superintendent, same road, St. Louis, Mo.; February, 1900 to May, 1901, Assistant Superintendent, Eastern Division, G. T. R., Belleville, Ont.; June, 1901 to March, 1902, Superintendent, Eastern Division, same road, Montreal; March, 1902 to December, 1904, Superintendent, Western Division, same road, Detroit, Mich.; January, 1905 to April, 1907, Superintendent, Middle Division, same road, Toronto; April 1907 to August 16, 1912, General Transportation Manager, same road, Montreal. In an interview after his resignation had been announced, he is reported to have said: "I have been 36 years in railway service and have never been a day off the pay roll in that time. For the last two and a half years I have not had a holiday and in that time I have travelled in the course of my duties, at the rate of over 70,000 miles a year. I have now come to the conclusion not only that I want a rest, but that it is time I enjoyed some of the pleasures of life. I intend to go down to my summer cottage on Peaks Island, Casco Bay, until October 1, when I shall probably go abroad for four or five months. Beyond that I have no plans so far."

The Great North Western Telegraph Co., in order properly to take care of its rapidly increasing business, has recently completed a number of improvements in its larger offices. In the Toronto office there has been installed an up to date plant, the large main line switch which accommodates all the trunk lines having been moved, and the wires placed in a new, all steel frame, which also contains marble panels for table connection jacks. Special features of the new work include: steel switch board frame, new combined transfer protector, terminal rack and repeater tables. The multiplex apparatus has been placed on repeater tables near the switch board, and the operators placed on extended locals. This greatly facilitates the wire chiefs' work. The operating tables have been equipped with new style resonators and improved message clips. These changes have been made under the direction of C. E. Davies, Supervisor of Equipment, and J. Murdock, Electrician. The company is also making further improvements in its equipment at Montreal, Quebec, Ottawa, Hamilton, Ont., Campbellton, N.B., and Winnipeg, which when completed will add considerably to its present facilities.

The Fort George and Alberta Telephone and Electric Co. has erected a telegraph line connecting Fort George with the Government Yukon telegraph line at Blackwater, and it is said that arrangements are being made with the Government by which the company will cut in straight to Ashcroft and thence to Vancouver, thus obviating the necessity for relaying messages to the coast.

The Roadmasters and Maintenance of Way Convention will be held at Buffalo, N.Y., Sept. 10-13. Among those named to speak at the dinner on Sept. 12 is M. S. Blaiklock, Engineer Maintenance of Way, G.T.R., Montreal.

Honor Bestowed on T. C. Keefer.

T. C. Keefer, past President of both the Canadian and American Societies of Civil Engineers, and one of the oldest and best known engineers in America, has been elected an honorary member of the Institution of Civil Engineers of Great Britain, in recognition of the distinguished part he has taken in the engineering enterprises which have alded so largely the development and prosperity of Canada, and on account of the services he has rendered to the engineering profession during his long association with it. He will be 91 years old on Nov. 4. He began his engineering career in 1838 on the Erie canal. Later he was Division Engineer in the building of the Welland canal. In 1845 he was Chief Engineer of the Ottawa River improvement work. Six years later he made preliminary surveys for the G.T.R., and his influence was largely responsible for the abandonment of the broad gauge. He was engineer for the design and construction of the waterworks of Montreal, Hamilton and Ottawa, and was prominent in the inception and ultimate construction of the C.P.R. He was the first President of the Canadian Society of Civil Engineers in 1887, and served again in that office in 1897. He is a Companion of the Order of St. Michael and St. George, an officer of the French Legion of Honor, and has been the recipient of many other honors.

The Commissioners of the Transcontinental Railway.

NOTICE TO CONTRACTORS

Tenders for Piping Systems, Pipe Tunnels, Pipe Coverings and Wiring Ducts.

Sealed Tenders, addressed to the undersigned, and marked on the envelope, "Tenders for Piping Systems, Pipe Tunnels, Pipe Coverings, and Wiring Ducts," will be received at the Office of the Commissioners of the Transcontinental Railway, at Ottawa, Ontario, until 12 o'clock noon, of the 16th day of September, 1912, for furnishing and installing all Piping Systems, Pipe Tunnels, Pipe Coverings, and Wiring Ducts required in connection with the Car Shop Plant of the Winnipeg Shops, situated in Section 5, Township 11, Range 4-E, on the line of the National Transcontinental Railway, about six miles East of Winnipeg, Manitoba.

Plans may be seen and specifications and forms of tender obtained at the office of Mr. W. J. Press, Mechanical Engineer, Ottawa, Ont., and at the office of Mr. H. H. Pinch, Assistant Engineer, Transcona, Manitoba.

Persons tendering are notified that tenders will not be considered unless made on the printed forms supplied by the Commissioners.

Each tender must be signed and sealed by all the parties to the tender, and witnessed, and be accompanied by an accepted cheque on a Chartered Bank of the Dominion of Canada, payable to the order of the Commissioners of the Transcontinental Railway, for a sum equal to ten per cent. (10 p.c.) of the amount of the tender.

The cheque deposited by the party whose tender is accepted will be deposited to the credit of the Receiver-General of Canada, as scurity for the due and faithful performance of the Contract according to its terms. Cheques deposited by parties whose tenders are rejected, will be returned within ten days after the signing of the contract.

The right is reserved to reject any or all tenders.

By order,

P. E. RYAN,

Secretary.

Dated at Ottawa, August 22nd, 1912.

Newspapers inserting this advertisement without authority from the Commissioners, will not be paid for it.—27510.

Transportation Appointments Throughout Canada.

The information under this head, which is almost entirely gathered from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who may notice an error in our announcements will confer a favor by advising us.

Canadian Northern Ry.—P. A. Van Es & Co., Rotterdam, Holland, who are the General Agents on the European continent for the Canadian Northern Ry., except in Patras, Greece, have appointed the following agents:—

Antwerp—John P. Best & Co.

Bremen—Carl Prior.

Paris and Havre—Caplain, Cahen & Strauss.

Barcelona and Valencia—McAndrews & Co.

Alicante—Carey & Co

Stockholm—Aktiebolaget Nyman & Schultz.

Gothenburg—C. W. Lindegren.

Christiana—Th. Mortensen.

Canadian Pacific Ry.—ERNEST ALEXANDER, heretofore Assistant Treasurer, has been appointed assistant Secretary, vice A. R. G. Heward, deceased. There are two Assistant Secretaries, H. Campbell Oswald being the other. Office, Montreal.

M. J. POWER, heretofore secretary to the President, has been appointed General Storekeeper for Lines East of Fort William, Ont., vice J. H. Callaghan, deceased. Office, Montreal.

F. E. DEWEY has been appointed Assistant Inspector of Transportation, Eastern Lines, vice J. B. Smith, who is acting as Assistant Superintendent, Montreal Terminals. Office, Montreal.

W. H. STEWART, heretofore chief clerk to H. H. Vaughan, Assistant to the Vice President, Montreal, and latterly acting Assistant Superintendent, Ottawa, has been appointed Assistant Superintendent, District 4, Eastern Division, vice J. H. Boyle, appointed Superintendent, District 3, Lake Superior Division, Schreiber, Ont., as announced in our last issue. Office, Ottawa.

R. C. MORGAN, heretofore Superintendent, Great Northern Ry., Spokane and Marcus, Wash., has been appointed Superintendent, Fort William Terminals, vice R. Armstrong, transferred. Office, Fort William, Ont.

A. McARTHUR has returned to duty as Locomotive Foreman at Fort William, Ont., and A. Sturrock, who has been acting Locomotive Foreman, has returned to his former position as Back Shop Foreman at Fort William.

L. B. COPELAND, heretofore Roadmaster, Parry Sound, Ont., has been appointed Roadmaster, Regina subdivision, Saskatchewan Division. Headquarters, Regina.

District 3, Saskatchewan Division, heretofore covering the territory, Bredenbury to Hardisty, except Bredenbury; Neudorf to Lanigan, except Neudorf, Rosetown to Macklin, has been divided, and is now operated as Districts 3 and 4, respectively, as follows:—District 3: Wynyard subdivision, except Bredenbury; Neudorf subdivision; Lanigan subdivision, including Saskatoon. Superintendent, R. ARMSTRONG, heretofore Superintendent, Fort William Terminals, Manitoba Division, Fort William, Ont. Office, Saskatoon. District 4: Saskatoon subdivision, except Saskatoon; Wilkie subdivision; Kerrobert subdivision. Superintendent, H. H. BOYD, heretofore Superintendent, District 3, Saskatchewan Division. Office, Saskatoon.

R. A. JONES, heretofore locomotive driver, Moose Jaw, Sask., has been appointed Master Mechanic, Saskatoon, Sask., vice J. D. Watson, resigned.

G. WHITELEY, heretofore District Master Mechanic, Moose Jaw, Sask., has been appointed acting Master Mechanic, Saskatchewan Division, vice D. T. Main, on leave of absence. Office, Moose Jaw.

G. F. BURGESS has been appointed acting District Master Mechanic, District 2, Saskatchewan Division, vice G. Whiteley, appointed acting Master Mechanic, Saskatchewan Division. Office, Moose Jaw.

W. J. READER has been appointed Storekeeper at East Calgary, Alta., vice A. Clark, transferred.

A. C. HARSHAW, heretofore Trainmaster, Maintenance and Operation, Calgary Terminals, has been appointed Superintendent, Calgary Terminals. Office, Calgary, Alta.

J. G. RUTHERFORD, V.S., formerly Chief Veterinarian, Dominion Government service, Ottawa, has been appointed Superintendent of Animal Husbandry, Department of Natural Resources, reporting to J. S. Dennis, Assistant to the President. Office, Calgary, Alta.

D. G. McDONALD, heretofore Locomotive Foreman, Red Deer, Alta., has been appointed Assistant Foreman, East Calgary, Alta., roundhouse.

H. ALLAN, heretofore first class boiler maker, Calgary, Alta., has been appointed Assistant Boiler Inspector, Alberta Division. Office, Calgary.

D. H. FORD, heretofore Roadmaster, White River, Ont., has been appointed Roadmaster, Laggan subdivision, Alberta Division. Headquarters, Calgary.

J. W. CORMODE, heretofore chief clerk, Stores Department, Calgary, Alta., has been appointed Assistant Stores Inspector, vice F. G. Bannister, resigned.

W. J. WOOD, heretofore Storekeeper, Medicine Hat, Alta., has been appointed chief clerk, Stores Department, Calgary, Alta., vice J. W. Cormode, promoted.

A. A. SMITH, heretofore Trainmaster, Lethbridge, Alta., has been appointed acting Superintendent, District 1, Alberta Division, vice J. M. Cameron, on leave of absence. Office, Medicine Hat.

H. ALLEN has been appointed Assistant Boiler Inspector, Alberta Division.

A. CLARK, heretofore Storekeeper, East Calgary, Alta., has been appointed Storekeeper at Medicine Hat, Alta., vice W. J. Wood, transferred.

W. BELL, heretofore Bridge and Building Foreman, Medicine Hat, Alta., has been appointed acting Bridge and Building Master, there, vice W. H. Gordon, appointed Trainmaster, Red Deer, Alta., as announced in our last issue.

C. A. LITTLE, heretofore Locomotive Foreman, Alberta Ry. and Irrigation Co., Lethbridge, Alta., has been appointed Locomotive Foreman, C.P.R., Red Deer, Alta., vice D. G. McDonald, assigned to other dutles.

W. H. MORTON, who was recently appointed Locomotive Foreman at Roseberry, Man., vice H. Ingram, resigned, has been appointed Shop Foreman at Kamloops, B.C., vice H. A. Keswick, resigned, and the position of Locomotive Foreman at Roseberry, Man., has been abolished.

W. E. HAYWARD has been appointed Locomotive Foreman at North Bend, B.C., vice C. H. Tedlock, resigned.

F. COCHRANE, heretofore conductor, has been appointed Night Yardmaster, Revelstoke, B.C. This is a new position.

Central Vermont Ry.—J. S. CARDER has been appointed Travelling Passenger Agent, New London, Conn.

Duluth, South Shore and Atlantic Ry.—E. R. LEWIS, formerly Division Engineer, Michigan Central Rd., Bay City, Mich., has been appointed Assistant to the General Manager, D. S. S. and A. Ry., and Mineral Range Rd., with duties as may be assigned to him from time to time by the Vice President and General Manager. Office, Duluth, Minn.

J. C. BEBB, formerly of the Michigan Central Rd. engineering department, is reported to have been appointed Assistant to Chief Engineer, D.S.S. & A.R., vice N. Cadarette. Office, Marquette, Mich.

Grand Trunk Pacific Ry.—H. A. WOODS, Assistant Chief Engineer, whose headquarters were removed from Montreal to Winnipeg, some time ago, has again been transferred to Montreal.

J. A. HEAMAN, heretofore Division Engineer, Fitzhugh, Alta., has been appointed Assistant to Chief Engineer. Office, Winnipeg.

S. P. PORTER, heretofore Deputy Minister of Railways, Telegraphs and Telephones, for the province of Saskatchewan, Regina, is reported to have been appointed Executive Agent, G.T.P. R., with office at Regina, Sask.

E. FARRINGTON, heretofore chief clerk, Trainmaster's office, G.T.R., Ottawa, has been appointed chief clerk and secretary to Superintendent, G.T.P.R., Regina, Sask.

F. J. GEORGE, heretofore Assistant Engineer on construction between Tete Jaune Cache and Fort George, reporting to Division Engineer, Fitzhugh, Alta., has been appointed Division Engineer, Fitzhugh, Alta., vice J. A. Heaman, promoted.

A. WATT, heretofore Locomotive Foreman, Prince Rupert, B.C., has been appointed General Foreman there.

The following agents have been appointed:—Cabot, Man., A. Jackson; Gregg, Man., D. W. Peters; Grand Trunk Pacific Jct., Man., E. E. Blaine; Gerald, Sask., R. W. Gibson; Tate, Sask., G. V. Nowlan; Bradwell, Sask., T. W. Fleming; Biggar, Sask., J. O'Leary; Coblenz, Sask., H. E. Henshaw; Lestock, Sask., P. D. Hamilton; Ebenezer, Sask., P. L. Bolton; Camrose, Alta., A. McRae; Ryley, Alta., E. D. Young.

Grand Trunk Ry.—W. G. BROWNLEE, General Transportation Manager, having resigned, the position has been abolished. Division superintendents, Superintendent Car Service and others, reporting formerly to the General Transportation Manager, will report, until further notice, direct to the Vice President in charge of operation, H. G. Kelly.

E. S. COOPER, heretofore acting Trainmaster, Districts 1 and 2, Eastern Division, has been appointed Trainmaster, District 1, Eastern Division. Office, Island Pond, Vt.

J. W. FARRELL, heretofore Trainmaster, Districts 1 and 2, Island Pond, Vt., has been appointed Trainmaster, District 2, Island Pond, Vt.

H. W. MATTHEWS, Trainmaster, Districts 25 and 29, Western Division, has had his office changed from Port Huron, Mich., to Battle Creek, Mich.

C. A. GORMALY, heretofore Commercial Agent, St. Louis, Mo., has been appointed Commercial Agent, Chicago, Ill., vice H. E. Graves, retired after 46 years continuous service with the system and its affiliated interests.

W. H. BURKE, heretofore Travelling Freight Agent, Chicago, Ill., has been appointed Commercial Agent at St. Louis, Mo., vice C. A. Gormally, promoted.

J. A. BUCKNELL, heretofore Agent, Jackson, Mich., has been appointed Travelling Freight Agent, Chicago, Ill., vice W. H. Burke, transferred.

The following agents have been appointed:—Lacadie, Que., J. A. Langlois; Huntingdon, Que., E. E. Bourdon; Beauharnois, Que., E. Rheaume; St. Dominique, Que., J. B. Cataford; Keene, Ont., P. Stinson; Uhtoff, Ont., R. G. Winters; Kirkfield, Ont., G. Raymes; Allliston, Ont., E. M. Ellis; Everett, Ont., E. N. Marshall, Grimsby Beach, Ont., J. A. Mitchell; Winona, Ont., S. A. Fairweather; Hespeler, Ont., N. A. Walford; Owen Sound, Ont., J. G. Heyd; Whitechurch, Ont., R. M. Patten; Ripley, Ont., W. M. Salkeld; Vankleek, Ont., G. A. Cass; Kinburn, Ont., O. B. Elliott; Wilno, Ont., G. H. Bates; Brule Lake, Ont., P. F. Madden; Sprucedale, Ont., H. W. Otta; Rose Point, Ont., R. J. Hardy; Beaverton, Ont., W. T. Byam; Stoucville Junc., Ont., J. R. Hodgins; Brown Hill, Ont., S. W. Sterritt, Assistant; Greenfield, Ont., J. S. Gemmell; Pembroke, Ont., F. O. Parent; outside agencies: Galt, Ont., G. T. Misener; Ridgeway, Ont., J. G. Little; Sarnia, Ont., G. E. Wadland.

Hudson Bay Ry.—J. V. DILLABOUGH, heretofore office engineer, District F. National Transcontinental Ry., is reported to have been appointed to a similar position on the Dominion Government railway to Hudson Bay.

Intercolonial Ry.—J. GRAHAM has been appointed Foreman of Erecting Shop, Moncton, N.B., vice J. Nugent, superannuated.

Michigan Central Rd.—W. O. HOUSTON, heretofore on the engineering staff, has been appointed Division Engineer at St. Thomas, Ont., vice G. H. Harris.

J. H. MEGLEMRY has been appointed Division Freight Agent, Buffalo, N.Y., vice G. C. Ransom, resigned on his appointment as Chairman, Canadian Freight Association Eastern Lines, Montreal.

D. S. SUTHERLAND, heretofore Division Superintendent, Detroit, Mich., has been appointed General Agent, with such duties as may be assigned to him by the General Manager, and the position of Division Superintendent at Detroit has been abolished. Office, Detroit.

F. B. MARBLE, heretofore Division Engineer, Detroit, Mich., has been appointed Assistant to Chief Engineer, Detroit.

G. H. HARRIS, heretofore Division Engineer, St. Thomas, Ont., has been appointed Division Engineer, Detroit, Mich., vice F. B. Marble, promoted.

Prince Edward Island Ry.—J. E. R. McEWEN has been appointed Assistant Train Dispatcher, Charlottetown, P.E.I.

White Pass and Yukon Route.—J. L. McPHERSON, Civil and Mining Engineer, has been placed in charge of the Industrial Department, the purpose of which is to investigate the mining resources of Alaska and Yukon contiguous to the transportation property, and to aid in its development. Office, Skagway, Alaska.

C. J. ROGERS, heretofore acting Purchasing Agent, has been appointed Purchasing Agent, and the position of acting Purchasing Agent has been abolished. Office, Vancouver, B.C.

G. H. MILLER, heretofore acting Auditor, has been appointed General Auditor, and the position of acting Auditor has been abolished. Office, Skagway, Alaska.

H. WHEELER, who has been appointed Superintendent at White Horse, Yukon, vice W. Taylor, resigned, has charge of the River Division and the Mail Service Department, including stage lines.

The Northern Electric & Manufacturing Co.'s general supply catalogue no. 2 is now ready for distribution, and copies will be sent to every one regularly engaged in the electrical business whose name is at present on this company's mailing list. It is a large, well bound catalogue, with over 850 pages devoted to electrical supplies, telephone apparatus and fire alarm apparatus. An examination of the catalogue shows great care taken in compiling, particularly in the arrangement of the various sections, so as to make the location of any particular article quick and easy. The method of arrangement follows along the line of grouping the materials together in their various classes, thereby having the advantages of a separate bulletin catalogue, with the further advantage of the information all being under one cover, with no possible chance of being incomplete. Complete stocks of standard material listed in this catalogue are carried by the different branch houses at Montreal, Toronto, Winnipeg, Regina, Calgary, Edmonton and Vancouver, so that prompt shipment can be made to any part of Canada, and the delivery effected promptly.

J. W. Craigie, Goderich, Ont.; J. S. Giles, C.P.R., Lachute, Que., and F. Eastman, G.T.R., Danville, Que., have become members of the Canadian Ticket Agents Association.

Dominion Railway Subsidy Agreements.

The Dominion Government has entered into agreements, under the acts granting aid for the construction of railways, as follows:—

QUEBEC AND SAGUENAY RY.—From St. Joachim, northeasterly, 62.8 miles. June 29.

DOMINION ATLANTIC RY.—From Centreville to Weston, not exceeding 15 miles, in lieu of subsidy granted in 1908. July 2.

NORTHERN NEW BRUNSWICK and Seaboard Ry.—From Drummond Mines at Austin Brook to the Intercolonial Ry., and from the latter point to Alston Point, not exceeding 26 miles. July 18.

HA HA BAY RY.—From the Quebec and Lake St. John Ry., at or near Mathias, Jonquieres tp., Que., not exceeding 20 miles;

From Labrosse Jct., to the Saguenay river, northerly through Chicoutimi, not exceeding 5 miles;

From La Terriere Jct., southerly to Lake Kenogami, by way of La Terriere village, not exceeding 12 miles;

From Bagotville village, easterly to St. Alexis village, not exceeding 3 miles. July 18.

CANADIAN PACIFIC RY.—Towards the construction of a railway bridge over the Saskatchewan river, connecting Strathcona with Edmonton, in lieu of subsidy granted in 1908. Aug. 2.

CANADIAN NORTHERN PACIFIC Ry.—From the Yellowhead Pass to Vancouver and the mouth of the Fraser river, 525 miles. Aug. 7.

Eye and Ear Tests for Railway Employes.—The Board of Railway Commissioners' judgment in this matter was given fully in Canadian Railway and Marine World for August. An order has been set forth in a schedule attached to the order and entitled "Uniform rules governing the determination of visional accuity, color perception and hearing of railway employes on steam railways."

First Aid to Injured on the C.P.R.—In the article on this subject in Canadian Railway and Marine World for August reference was made to a number of places at which classes have been established, but Smiths Falls, Ont., was not mentioned. We are advised that this is the banner class in the Dominion, having at the examinations last autumn passed the largest number of first aid men of any class.

The Canada Railway News Co. has been given the contract for catering in the Fort Garry union station, Winnipeg. Alterations are to be made in the north wing on the ground floor, so as to provide adequate accommodation, and it is expected to open the restaurant during September.

The Fort Garry, the Grand Trunk Pacific Railway's Winnipeg Hotel.

This illustration, from the architect's drawing, shows the Grand Trunk Pacific Ry.'s hotel being built on Broadway, Winnipeg, opposite the Manitoba Club, and close to the Fort Garry union station. It is said it will be the equal of the Chateau Laurier, at Ottawa, in appearance and luxuriousness of appointment and will cost about $1,000,000.

Bridge Construction on the Canadian Northern Pacific Railway.

Some details of the ten bridges on the Fraser and Thompson Rivers in British Columbia, for which tenders were being asked by the Canadian Northern Pacific Ry., were given in Canadian Railway and Marine World for July, pg. 337, mentioning the location and character of each bridge. We now republish the details, together with considerable further information as to the weight, method of erection, etc., of the bridges.

No. 1 will cross the Fraser River a short distance above the C.P.R. bridge, or about five and a half miles below Lytton. Starting from an abutment on the hillside at the west end, the structure will have three 40 ft. deck plate spans, supported by a steel bent and a steel tower, a 60 ft. plate girder span over the C.P.R. right of way, a 40 ft. tower span and tower, a 90 ft. plate girder span, a 424 ft. three hinged rivetted spandrel arch span and a 30 ft. plate girder span.

The substructure will consist entirely of concrete pedestals, those for the arch springing from solid rock, and the others, with enlarged bases, resting upon earth. The depth of the foundations of the latter cannot be determined until the excavations are made. At the easterly end of the structure the almost vertical face of the rock will have to be cut away in order to reach material sound enough to provide a satisfactory footing for the steel pedestals of the arch, and to give clearance for the end vertical posts thereof. The arch is to be erected by cantilevering from the rock bluff at the easterly end, and from the steel towers at the westerly end.

The approximate quantities of materials are:—Concrete in pedestals and abutments, and for filling column feet, 1,290 cubic yards; metal furnished specially for substructure and embedded in the concrete, 1,000 lbs.; solid rock removed from bluff at east end, 1,000 cubic yards; structural steel in arch span, including that temporarily used for cantilevering, 2,355,000 lbs.; structural steel in plate girder spans and trestle, 520,000 lbs.; lumber in deck, 124 M., B.M.; track, 775 lineal feet.

No. 2 will cross the Fraser River just below Lytton, about half a mile from the C.P.R. station. The portion of this bridge over the water will consist of a 292 ft. riveted span, with flanking spans of 150 ft. at each end, from which the centre span is to be erected by cantilevering. The approaches will be of deck plate girders supported by concrete piers.

The two main piers, of concrete, are to be put in by cofferdams; one of the side piers will be on bare rock, and the other piers and abutments are to be founded on earth in the dry. A small amount of riprap will be required for one of the main piers, and possibly for some of the others, but this cannot be determined until the excavations are made. The current of the river in the channel is swift, but at the sides it is moderate, and the bed is covered with rather large boulders, a combination which renders the use of false work for the middle span inadvisable, hence the side spans are first to be erected on falsework, and the main span is to be cantilevered from there; after which the toggles are to be removed and the bridge left as a single span structure. The upstream ends and the sides of the main piers are to be protected against grinding by metal plates.

Approximate quantities of materials:—Concrete in piers and abutments, excepting only the base of pier four (in which there will be 1,600 cubic yards), 6,900 cubic yards; metal for embedding in concrete, 2,000 lbs.; metal in pier protection, 26,000 lbs.; structural steel in truss spans, including that temporarily used for cantilevering, 2,345,000 lbs.; structural steel in plate girder spans, 510,000 lbs.; timber in deck, 124 M., B.M.; track, 981 lineal feet.

No. 3 will cross the Thompson River a very short distance above the mouth and within the town limits of Lytton. At the west end of the bridge there is to be a concrete abutment supporting a 90 ft. plate girder span, following which there will be three 150 ft. deck, open webbed, riveted girder spans, the westerly one resting on either a small concrete abutment or a bearing cut into the solid rock. The concrete piers are all to be parallel to the current.

The foundations for the piers are of solid rock, and the construction will be in the dry at a comparatively low stage of water. The spans will be on a skew. No protection will be required against ice. The current is very swift, from seven to 11 miles an hour, but the low water channel is quite narrow.

Approximate quantities of materials:—Concrete in piers, pedestals and abutments, 3,870 cubic yards; metal embedded in concrete, 1,000 lbs.; rock excavation from bluffs, 40 cubic yards; structural steel in truss spans, 1,134,000 lbs.; structural steel in plate girder spans, 140,000 lbs.; timber in deck, 130 M., B.M.; track, 580 lineal feet.

No. 4 will cross the Thompson River midway between Spatsum station and Black Canyon siding, on the C.P.R. The superstructure will consist of six 125 ft. deck, open webbed, riveted spans, supported by five concrete piers and two concrete abutments. Four of the piers have to rest on pneumatic caissons, and the other pier and abutments are to have ordinary earth foundations.

Approximate quantities of materials:—Concrete in shafts of piers and in abutments, 1,750 cubic yards; mass of bases in pneumatic piers, 1,700 cubic yards; mass in base in open dredging pier, 285 cubic yards; piles below cutting edges of base, 1,000 lineal feet; metal embedded in concrete, 6,000 lbs.; metal in cutting edges, 50,000 lbs.; structural steel in truss spans, 1,724,000 lbs.; timber in deck, 156 M., B.M.; track, 780 lineal feet.

No. 5, which will cross the Thompson River about six miles below Ashcroft, will consist of a single through truss span of about 16 ft., resting on little concrete abutments that are resting on solid rock. As the final survey of this crossing has not yet been made, the span length may have to be changed later. As the bridge is located over a narrow deep gorge, it will be necessary to erect by cantilevering and anchoring back into the solid rock.

Approximate quantities of materials:—Concrete in abutments, 380 cubic yards; metal embedded in concrete, 1,000 lbs.; structural steel in truss span, including that temporarily used for cantilevering, 500,000 lbs.; timber in deck, 22 M., B.M.; track, 190 lineal feet.

No. 6 will cross the Thompson River about two miles above Ashcroft. It will consist of six 93 ft. deck plate girder skew spans on concrete piers having shafts parallel to the current. These shafts will rest on cribs containing concrete and piles, if the latter can be driven, as in all probability they can by using water jets, for the material to be penetrated is mainly sand and gravel, covered in many places with boulders.

Approximate quantities of materials:—Concrete in shafts of piers and abutments, 2,120 cubic yards; mass of bases of piers, 1,820 cubic yards; metal embedded in concrete, 1,000 lbs.; metal in cutting edges, 45,000 lbs.; structural steel in plate girder spans, 783,000 lbs.; timber in deck, 75 M., B.M.; track, 555 lineal feet.

No. 7, which will cross the Thompson River another mile above Ashcroft, will be on a skew. It will consist of twelve 85-ft. deck plate girder spans, resting on 11 concrete piers and two concrete abutments.

For about half the foundations it will probably be advisable to use cofferdams, and for the other half cribs. Piles are to be used in every foundation where it is possible to drive them.

Approximate quantities of materials:—Concrete in shafts of piers and in abutments, 2,760 cubic yards; mass of bases of piers, 3,410 cubic yards; piles below cutting edges of bases of piers, 18,200 lineal feet; metal embedded in concrete, 3,000 lbs.; metal in cutting edges, 43,000 lbs.; structural steel in plate girder spans, 1,436,000 lbs.; timber in deck, 146 M., B.M.; track, 1,055 lineal feet.

No. 8 will bisect the Thompson River about a mile below Wallachin. It will consist of 11 93 ft. deck plate girder, skew spans. These will rest on 10 concrete piers and two concrete abutments to be founded on piles, if they can be driven.

It will be advisable to employ cofferdams instead of cribs for the building of some of the piers. Riprap of large stones will be required round each pier. The depth of the foundations cannot be determined until the excavation is done.

Approximate quantities of materials:—Concrete in shafts of piers and in abutments, 2,290 cubic yards; mass of bases of piers, 1,820 cubic yards; metal embedded in concrete, 1,000 lbs.; riprap, 660 cubic yards; structural steel in plate girder spans, 1,455,000 lbs.; timber in deck, 140 M., B.M.; track, 1,030 lineal feet.

Bridge No. 9 will cross the Thompson River almost midway between Wallachin and Savonas, which stations are some seven miles apart. At the west end of the bridge location there is a rocky hill from the foot of which the bridge will start with a through skew span of about 200 ft., then will come six half through, plate girder skew spans of 91 ft. each. These spans will rest on concrete piers and abutments.

The west abutment will be built in the dry; no. 1 pier, the east abutment and two or three of the other piers will require the use of coffer dams, and the remaining piers will rest on cribs filled with concrete and piles. The water is deep and swift, and the bottom is so paved with large boulders as to be practically impenetrable, so that the erection of falsework for the long span is out of the question.

Probably the most satisfactory and economical method would be to use three barges thoroughly braced together horizontally at their tops and carrying timber falsework braced substantially in vertical planes. The metal would have to be barged out from up stream and let down by lines from deadmen. By always adhering to as symmetrical and uniform a distribution of metal over the falsework as possible, cantilevering the two end panels beyond the barges, keeping the metal at all times well above its final elevation, and letting water into the barges when the steelwork is all up and connected, no serious inconvenience would be encountered in the erection of this span. It would be only sudden fluctuations of water level that could cause trouble; but from the time that the high water is over in the autumn until about the middle of April no material rise of the water level is likely to occur. The other spans, of course, would be erected in the usual manner by travelling derrick.

Approximate quantities of materials:—Concrete in shafts of piers and in abutments, 4,610 cubic yards; mass of bases of piers, 2,150 cubic yards; piles below cutting edges of bases of piers, 2,600 lineal feet; metal embedded in concrete, 1,000 lbs.; metal in cutting edges, 24,000 lbs.; structural steel in truss span, 570,000

lbs.; structural steel in plate girder spans, track, 756 lineal feet.

No. 10 will cross the North Thompson River some four miles by water from Kamloops. It will consist of thirteen 93-ft. deck plate girder spans resting on fourteen concrete piers.

For the present there will be no abutments, as there is to be a wooden trestle at each end of the structure. One of the spans will be lifted from two steel towers in order to permit the passage of river steamers, which at certain stages of the water navigate the stream. Long piles sunk by water jets are to be used, and there will be no difficulty in sinking any of the cribs to the required depths. The operating machinery for the lift span is to consist of a 12 h.p. gasoline engine.

Approximate quantities of materials:—Concrete in shafts of piers, 1,910 cubic yards; mass in bases of piers, 3,290 cubic yards; piles below cutting edges of bases of piers, 29,000 lineal feet; metal embedded in concrete and for pier protection, 29,000 lbs.; structural steel in plate girder spans, towers, dolphin-chains and counterweights, 1,886,000 lbs.; machinery metal of every kind, except wire ropes with their attachments, gasoline engine and all its appurtenances, 33,000 lbs.; wire ropes, 3,700 lbs.; attachments for wire ropes, 1,000 lbs.; wire rope dressing 100 lbs.; concrete in counterweights, 53 cubic yards; piles in dolphins, 2,100 lineal feet; timber in deck, 160 M., B.M.; track, 1,209 lineal feet.

The contracts call for the completion of the substructure work as follows:—Piers for the main span of bridge 9, Dec. 1; entire substructures of bridges 1, 2, 3 and 4, by Jan. 1, 1913; entire substructures of bridges 6, 7, 8 and 10, by Feb. 1, 1913; remaining piers of bridge 9, by Mar. 1, 1913. The contracts fix the following dates for the completion of the superstructures:—Feb. 1, 1913, main span of bridge 9; Mar. 1, 1913, bridge 5; Mar. 15, bridge 4; April 1, 1913, spans of bridge 10; May 1, 1913, bridges 6, 7, 8, and the remaining spans of bridge 9; May 15, 1913, bridges 2, 3, and the towers and machinery of bridge 10; June 1, 1913, bridge 1.

The plans and specifications were prepared by Waddell and Harrington, Consulting Engineers, under whose supervision the construction will be carried out. The substructures for bridges 1, 2, 4, 5, 6, 7 and 10 will be built by Armstrong, Morrison & Co., Vancouver, B.C.; and that for bridge 3 by the John Galt Engineering Co., Winnipeg, Man. The contracts for the substructures at bridges 8 and 9 were not definitely let, but we are advised they will probably be let to C. F. Graff, Seattle, Wash. The Dominion Bridge Co. will erect the superstructures of bridges 1, 2, 3, 5, 9 and 10; and the Canadian Bridge Co. will erect bridges 4, 6, 7 and 8.

Prevention of Fires Along Railways.

The Canadian Pacific, Canadian Northern, and Grand Trunk Pacific railways applied to the Supreme Court, at Ottawa, Aug. 8, for leave to appeal against certain sections of order 16570 of May 22, 1912, issued by the Board of Railway Commissioners prescribing regulations to be adopted by the railways under its jurisdiction, with a view to preventing forest fires along their rights of way. The order was issued following an application of the British Columbia Lands Department, supported by the Forestry Branch of the Dominion Conservation Commission. The order was given in full in Canadian Railway and Marine World July, pg. 342.

The section providing that the companies shall have inspectors at terminal or divisional points where its locomotives are housed and repaired, and prescribing the duties of such inspectors regarding fire protection and equipment, was argued by the applicants to be outside the Board's jurisdiction, but the Court held that there was no arguable case, and refused leave to appeal.

On the question that any authorized officer of the Board might inspect at any time any and all locomotives, and remove from service such as are not considered properly equipped with fire protective appliances, the Court held that the Board's jurisdiction in so far as it delegated its power to an officer, might be called in question, the Board itself might do it, and by amendment, the Board might bring this section within its jurisdiction.

The section forbidding the use of lignite coal is one on which the Board has jurisdiction, but the question was adjourned to the fall sitting of the Court, as was also the application re the section providing that the chief fire inspector shall send to each railway every year regulations which the companies are required to comply with, on the question of delegation of authority by the Board, which the Court considers might be got over by amendment, the time being allowed in order that the British Columbia Government might suggest such amendment if wanted.

The section providing that sectionmen and other railway employes shall take measures to report and extinguish fires along the right of way, was declared to be within the Board's jurisdiction and leave to appeal was refused.

Railway Connections and Interswitching at Galt.

As a result of a joint sitting of the Board of Railway Commissioners of Canada and the Ontario Railway and Municipal Board, the following order, 17064, was issued by the Board of Railway Commissioners under date of July 5:—

Re applications of the boards of trade of Galt, Preston, Hespeler, Berlin, and Waterloo, Ont., for an order directing the C.P.R., the G.T.R., the Galt, Preston and Hespeler St. Ry., and the Preston and Berlin St. Ry. Co. to connect their tracks in Galt, Preston, Hespeler, Berlin and Waterloo, so as to admit the safe and convenient transfer or passing of engines, cars, and trains from the tracks of one of the above to those of the others, and that such connections shall be maintained and used by the said railway companies, respectively. Upon the hearing of the application at a joint session of the Board of Railway Commissioners for Canada and the Ontario Railway and Municipal Board at Galt, Ont., June 20—

It is ordered that the G.T.R. and the Galt, Preston and Hespeler St. Ry. tracks be connected in the towns of Galt, Preston and Hespeler, and that the G.T.R. and the Preston and Berlin St. Ry. tracks be connected in Berlin and Waterloo, at points to be agreed upon between the said companies within ten days from the date of this order, for the purposes applied for, and for the reasonable receiving, forwarding, delivering, and interswitching of traffic between the said railways; that plans showing the locations of said connections be submitted for the approval of an engineer of the Board of Railway Commissioners; that in the event of the companies failing to agree upon the said points of connection, the same be fixed by the Chief Engineer of the Board of Railway Commissioners; that the work of construction be done by the respective railway companies on their own rights of way, provided that the Galt, Preston and Hespeler St. Ry. and the Preston and Berlin St. Ry. do the work of overhead wiring on the property of the G.T.R. as well as upon their own rights of way; that the question of the distribution of cost be reserved for further consideration, except that with regard to the interchange connection at Hespeler, the work, by agreement, be done by Mr. Cribbs to the satisfaction of an engineer of the Board of Railway Commissioners, he having undertaken it for $1,000, and that the determination of the proper interswitching rates be reserved until the matter has been reported upon by the Traffic Officer of the Board of Railway Commissioners.

Transportation Conventions in 1912.

Sept. 9.—International Association of Ticket Agents, Muskoka, Ont.

Sept. 10-13.—Roadmasters' and Maintenance of Way Association, Buffalo, N.Y.

Sept. 10-13.—Master Car and Locomotive Painters' Association of United States and Canada, Denver, Col.

Sept. 12.—American Association of General Passenger and Ticket Agents, Seattle, Wash.

Oct.—American Railway Bridge and Building Association, Baltimore, Md.

Oct. 7-11.—Association of Transportation and Car Accounting Officers, Chicago, Ill.

Oct. 7-11.—American Electric Railway Association, Chicago, Ill.

Oct. 8-9.—Canadian Ticket Agents' Association, Ottawa, Ont.

Oct. 15-17.—American Railway Bridge and Building Association, Baltimore, Md.

Oct. 17-19.—American Association of Dining Car Superintendents, Denver, Col.

Oct. 23-25.—Society of Railway Financial Officers, Atlantic City, N.J.

Nov. 6-10.—Association of Railway Electrical Engineers, Chicago, Ill.

Nov. 15.—American Railway Association, Chicago, Ill.

Nov. 15-16.—American Association of Freight Traffic Officers, Chicago, Ill.

Nov. 19-21.—Maintenance of Way Master Painters' Association, Chicago, Ill.

Dec. 12-13.—Association of Transportation and Car Accounting Officers, Louisville, Ky.

Railway and Allied Associations, Clubs, Etc.

The names of persons given below are those of the secretaries.

CANADIAN CAR SERVICE BUREAU, J. E. Duval, 401 St. Nicholas Building, Montreal.

CANADIAN FREIGHT ASSOCIATION (Eastern Lines), G. C. Ransom, Canadian Express Bldg., Montreal.

CANADIAN FREIGHT ASSOCIATION (Western Lines), W. E. Campbell, 502 Canada Building, Winnipeg.

CANADIAN RAILWAY CLUB, J. Powell, St. Lambert, Que. Meetings at Montreal 2nd Tuesday each month, 8.30 p.m., except June, July and August.

CANADIAN SOCIETY OF CIVIL ENGINEERS, C. H. McLeod, 413 Dorchester St. West, Montreal.

CANADIAN STREET RAILWAY ASSOCIATION, Acton Burrows, 70 Bond Street, Toronto.

CANADIAN TICKET AGENTS' ASSOCIATION, E. de la Hooke, London, Ont.

CENTRAL RAILWAY AND ENGINEERING Club of Canada, C. L. Worth, 409 Union Station, Toronto. Meetings at Toronto 3rd Tuesday each month, except June, July and August.

EASTERN CANADIAN PASSENGER ASSOCIATION, G. H. Webster, 54 Beaver Hall Hill, Montreal.

ENGINEERS' CLUB OF MONTREAL, R. W. H. Smith, 9 Beaver Hall Square, Montreal.

ENGINEERS' CLUB OF TORONTO, R. B. Wolsey, 94 King St. West, Toronto.

NOVA SCOTIA SOCIETY OF ENGINEERS, A. R. McCleave, Halifax, N.S.

QUEBEC TRANSPORTATION CLUB, J. S. Blanchet, Quebec.

WESTERN CANADA RAILWAY CLUB, W. H. Rosevear, 25½ Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month except June, July and August.

Grand Trunk Pacific Railway Construction.

Collingwood Schreiber, Dominion Government Consulting Engineer, returned to Vancouver, B.C., Aug. 8, after having completed a trip of inspection over the line and the sections under construction in British Columbia. He stated that he was satisfied with the progress made and the character of the work done. The work, however, had been held up to some extent by strikes, but these had not been so extensive as had been reported. There was also some shortage of labor. He was of opinion that the line would be completed through to the Pacific coast before the end of 1914, although there will be a great deal of finishing up work to be done after the track had been laid.

A. W. Smithers, Chairman of the Board, and E. J. Chamberlin, President, arrived in Winnipeg, Aug. 12, on an inspection trip. They planned a trip to the end of the steel west of Edmonton, returning to Edmonton and proceeding thence by C.P.R. to Vancouver; from that place by steamer to Prince Rupert, and east by rail to the end of track. On the return journey it is proposed to make an inspection of the several branch lines under construction. Both Mr. Smithers and Mr. Chamberlin stated that there was nothing to announce as to future plans; the trip was being made for the purpose of seeing the work which was in progress, and of obtaining information upon which future developments would be decided.

It is said that a union station will be erected at Edmonton, in conjunction with the Edmonton, Dunvegan and British Columbia Ry. Press reports state that the building will be two stories high, with a frontage of four city blocks, and that the train shed will have six sets of double tracks, with four platforms.

We are officially advised that a contract has been let to the Canadian Stewart Co. for the erection of an hotel in Edmonton at a cost of about $750,000.

Track has been laid through Tete Jaune Cache to mileage 53 in British Columbia. This will be the terminus for some time, as the Fraser River is being utilized to get supplies in as far as Fort George. The contractors have met with an unexpected setback at the Goat River, where a quicksand has been struck in a 1,000 ft. tunnel which is being driven there. It is expected to have the steel laid to the Shuswap River, 50 miles beyond the present rail head, by Oct. 1, and to have the grading and bridgework as far as Smithers ready for the steel laying gang by Nov. 1.

From the western end track has been laid to mileage 171, and it is reported that as soon as the bridgework is completed, which, it is expected, will be early in the fall, track can be laid as far as Aldermere.

GRAND TRUNK PACIFIC BRANCH LINES.

The mayor of Brandon, Man., has been advised that the construction of the branch line into Brandon will be undertaken at once, but it will not be completed this season, as its construction involves the erection of a large bridge across the Assiniboine River.

The Board of Railway Commissioners has authorized the operation of trains over the Canadian Northern Ry. in Regina, Sask This is on the line from Melville, Sask. On the line southerly from Regina to the International boundary track has been laid to Cedux, and it is expected that track will be laid to Frobisher, near the boundary, by the end of the year. Press reports state that construction is to be started at once on a line from Cedux into Weyburn.

In connection with the line under construction from Regina to Moose Jaw, Sask., an agreement has been reached as to the route through the city. The plans are before the Board of Railway Commissioners for approval, and the right of way is being acquired. Track is reported to have been laid for about 10 miles on the branch north-westerly from Moose Jaw, and it is further reported that considerable grading has been done on the branch running out of Moose Jaw westerly.

Ballasting is reported to have been completed between Young and Wakow on the branch line from Young to Prince Albert, Sask, but no further tracklaying has been done. The construction of the branch involves the erection of a bridge across the South Saskatchewan River, but it is said that this will not be started until next year.

Tracklaying on the branch from near Biggar to Battleford was started in July, and about 10 miles is reported to have been laid. Grading has been completed as far as Battleford, and for some distance beyond into the Cutknife district. For this extention revised location plans have been approved for 13 miles between mileage 26.26 and 38.74 by the Board of Railway Commissioners.

It is expected to complete tracklaying on the branch from Biggar towards Calgary, as far as Lovearne this season. This branch will connect with the Tofield-Calgary line near Swalwell, Alta. This latter branch is being operated as far as Trochu, 121 miles. and track is reported to have been laid 14 miles further on. It is expected to have track laid to Irricoma, 35 miles further south, this season. The grading has been practically completed into Calgary. A Calgary press dispatch states that there is a prospect of track being laid into Calgary this year. The erection of the bridge across the Elbow River may delay matters somewhat, as this will not be progressed with until the company can haul in the material over its own line.

In an interview in Winnipeg, M. Donaldson, Vice President and General Manager, is reported as stating that in addition to completing the branch under construction from Bickerdike, Alta., to the Brazeau coal fields, a branch will be built from Bickerdike in a southwesterly direction. A coal mining company is also proposing to build about 30 miles of lines to connect its mines with the G.T.P. Ry. lines in the district. (Aug., pg. 413.)

National Transcontinental Railway Construction.

Recent press reports from Fredericton, N.B., state that three gangs of section men have been placed on the line between Moncton and Grand Falls, N.B., and are at work under the direction of T. C. Burpee, Engineer of Maintenance of Way, Intercolonial Ry. It is added that the local understanding is that the Intercolonial Ry. will shortly establish a train service on the line, pending its being taken over by the G.T. Pacific Ry.

In an interview at Quebec, Aug. 11, R. W. Leonard, Commissioner, is reported as stating that he had been studying the question of the terminal in Quebec. He had a conference with W. Wainwright, Vice President, and a representative of the engineering staff of the G.T.P. Ry. on the matter. It is proposed to make some changes in the plans, which will be submitted to E. J. Chamberlin, President, upon his return from the west early in September.

M. J. O'Brien is reported as stating that grading is completed on the section of the line he is building to 150 miles east of Cochrane, Ont., with the exception of about 35 miles, which he expects will be finished this year. Track has been laid over the greater portion of this mileage, and will be completed early next year. Track is laid from Cochrane easterly practically to a junction with the O'Brien contract. It is expected, adds Mr. O'Brien, that the whole line from Quebec to Cochrane will be ready for traffic, except for the finishing up process, by June 30, 1913.

Track is laid for over 250 miles west of Cochrane, and on the section under construction between track end and Superior Jct. temporary trestle bridges are being erected, in the expectation of connecting up the steel, so that it may be possible to run grain trains over the line and out to eastern points via the Timiskaming and Northern Ontario Ry. and the G.T.R. during the winter.

Traffic Orders by the Board of Railway Commissioners.

The dates given for orders are those on which the hearings took place, and not those on which the orders were issued:—

Rates on Gas House Coke.

16707. June 4. Re complaint of Consumers' Gas Co. of Toronto complaining that rates on gas house coke from Buffalo to Hamilton, Brantford, and Toronto create an unjust discrimination in favor of Buffalo and against Toronto; and re order 16453, dated May 6, 1912, made therein; and re the application for an order to amend the said order, upon reading what is alleged, and the consent of parties interested, it is ordered that order 16453, be amended by substituting the words "forty thousand pounds" for the words "thirty thousand pounds" where they occur in the said order.

Grand Trunk Pacific Railway Tariff.

16922. June 28. Re application of G.T. Pacific Ry., under sec. 327 of the Railway Act for an order approving of its Standard Freight Mileage Traffic C.R.C. 10, between its stations in Alberta, Thornton to Fitzhugh, inclusive, it is ordered that the said tariff be temporarily approved, pending the result of the enquiry by the Board into the rates charged generally by the railway companies west of and including Crowsnest, Canmore and Thornton.

Vancouver, Fraser Valley and Southern Railway Rates.

16939. July 4.—Re order 16225, April 3, prescribing local tolls of Vancouver, Fraser Valley & Southern Ry. on lumber and other forest products, in carloads, between stations on its railway, and the joint through rates on the said lumber and other forest products, in carloads. from its stations between Vancouver and New Westminster to points on the Canadian Pacific and Canadian Northern Railways via Vancouver or New Westminster: Upon the failure of the V.F.V. & S. Ry. to file tariffs of its rates, so as to comply with the requirements of the order, although repeatedly urged, under the direction of the Board, to do so—it is ordered that the railway company be subject to a penalty of $25 a day for every day after July 10 it shall be in default in complying with the requirements of the said order.

Stop-off Arrangements East of Toronto, Ont.

17179. July 22.—Re application of British-Canadian Canners, Ltd., and the notice calling upon the G.T.R. to show cause why the "stop-off" arrangement with respect to canned goods, as shown in item 4 of the company's Special Freight Tariff C.R.C. E. 2374, applicable west of Toronto only, should not be extended so as to include Bowmanville and Cobourg as stop-over points; it is ordered that the stop-over privileges granted by the said railway companies operating from the Niagara Peninsula, westward, in Ontario, be granted the applicants at the two points east of Toronto, namely, Bowmanville and Cobourg, Ont.

The Grand Trunk Pacific Ry. has advanced the wages of its track repair laborers to a minimum basis of $2 a day, and the foremen to a minimum of $79 a month.

The Handling of Section Gangs.

By T. Hickey, Roadmaster, Michigan Central Rd., St. Thomas, Ont.

The majority of our track laborers on sections in this country are English speaking, although I have on a few sections some foreigners, Greeks, Italians and Austrians. Our yard forces are composed of English speaking men and foreigners, the latter in the majority, as we find it more difficult to hire and hold English speaking men in the larger cities, although we pay laborers in yards five cents a day more than is paid on outlying sections.

Our system is to hire our summer force commencing April 1, and work them until about November 1, reduction of forces of about 35% is then made during the winter months. If summer forces are hired April 1, we can usually get all the men we want at that time, and as a general thing they will work all through the summer months, but if we do not hire our summer forces on April 1, the men whom we expect to get will hire out elsewhere, and the chances are that the section foremen, on several sections, at least, will be short of men the greater part of the summer. It is important to hire summer forces early in the season, as by so doing the required number of men can easily be obtained by the foremen and better men can be secured. Foremen have men engaged for their summer force, in the majority of cases, expecting to be instructed to hire them April 1st. Should anything prevent and the foremen are not instructed, there is a disappointment. The men go in search of employment elsewhere, which results in a shortage of men on sections during the season, more particularly in small towns.

Where section headquarters are so located that there is no available house for the foreman to rent in which to live, a house is provided by the company, for which the foreman should pay a nominal rent, sufficient to pay 5% on the money invested. It is a great advantage to have the foremen and their laborers, when possible, live in the company's houses, as the roadmaster would then know where to find them on short notice, if wanted at night. Foremen and laborers should be allowed to cultivate for garden purposes a small patch of ground on the right of way, where there would be no objection to doing so. It would be an encouragement to the men and no detriment to the company; in fact, it would be a benefit, as such cultivating may prevent fire from spreading and will keep down obnoxious weeds.

Section foremen make a weekly work report. They are furnished a form on which to make such reports. On this report is shown the number of men employed each day and the amount and kind of work performed each day. It is surprising to note the interest taken by the different foremen in increasing their daily output of work, as each foreman tries to see if he cannot do a little more than his neighboring foreman.

Some 20 years ago section laborers were almost universally English speaking, and in most cases native Americans. Conditions have gradually changed, and now a large proportion of track laborers belong to inferior classes and foreign labor. As is to be expected under these conditions, it is getting difficult to select suitable foremen.

To induce young men to enter the service, provision should be made, I think, to pay them a slightly higher rate than the average laborer's rate to one man in each gang, with the understanding that he remain in the service and be given opportunity to develop into a foreman. This would encourage at least a few good bright young men to enter the track service and remain, and would be the means of selecting good foremen. It is the ambition of a good roadmaster to have an organization of good foremen about him, the work of which he should appreciate.

With the rapid change taking place in the character of forces making up extra gangs, the methods of organization of ten years ago have become inapplicable. The roadmasters who have studied conditions and revised their methods to meet these changed conditions are making the least complaint about the quality of the present labor. While the labor is not all that could be desired, in many cases the man who complains is not getting from it all that he can. Its quality will scarcely improve, and the problem facing the roadmaster is so to arrange his forces as to get the best results from the labor available.

A roadmaster has several first class section foremen from whom he can select extra gang foremen. To change a foreman from a section to an extra gang should be considered a promotion and recommendations for the position of assistant roadmaster can be made from extra gang foremen, according to ability shown and not on account of personal likes and dislikes, as is often the case. A section foreman used on extra gangs should not tend to demoralize the section organization. There is scarcely ever a time when a section foreman is promoted to an extra gang, but the roadmaster has a foreman ready to take charge of the section. The promotion of a section foreman should not disrupt the organization any more than the promotion of an assistant roadmaster to that of roadmaster, or assistant superintendent to that of superintendent.

Material should always be carefully distributed in advance of a gang so that there would be no delay or loss of time. The foreman should so place his men in doing the work that each man would do his part. For instance, in relaying rails he would place a certain number of men pulling spikes, a certain number of men adzing, wrenching, on tongs, spiking, etc., so that it will not be necessary to be continually changing some of the men from one place to another, with the consequent loss of time. This is particularly true with foreign labor: the same method can be carried out in doing other work.

A foreman should be furnished with a copy of all estimates of the cost of the work he is in charge of, to illustrate the advantage to the foreman of having such information as to the cost of work, and to give him a chance to do better than the estimate, or to explain its discrepancy.

A foreman should have good judgment and be familiar with the methods he intends to employ, both in the performance of his work and with different classes of labor. He should have force of character enough to uphold his opinion and give his men the impression that he thoroughly understands what he is doing. When a gang is organized, the first day is usually a try out between the foreman and the men, as the gang is usually composed of some men at least who have had some experience in the class of work they are about to engage in. If he has confidence in his own ability, the foreman will start in as if he had just moved from one portion of the work to another; the gang will have confidence in him at once; results will be shown from the start.

The foreman should have authority to hire his assistant foreman and timekeeper (timekeeper should be under bond); he should have power to hire and discharge without interference. His decision should be supreme as far as the organization of his gang is concerned. Roadmasters and other officials should judge him only by results obtained. The roadmaster should examine his requisitions for tools, etc., and look over such requisitions with him on the ground. Tools and other supplies and material should be furnished promptly. If requisitions are required the gang is hindered in making the progress it should, and this often reflects on the foreman on account of slow progress of the work, while in reality the fault is not his. Daily work reports should be made each day by the foreman, showing the number of men employed, the amount and kind of work performed, and these should be forwarded to the office of the division engineer and roadmaster; blank forms for such reports should be furnished the foremen.

Extra gangs should not be moved for small jobs. Instead of taking the extra gang away from an assigned job, and moving them perhaps a considerable distance, combine two section gangs for perhaps a day or two and complete the job. A foreman is given credit according to the cost of the work, not according to the labor actually spent upon it, and the cost of transportation is not always figured in the estimate.

A foreman who is doing good work and giving good results, as a rule, has complaints made against him frequently. I have noticed where other departments made it unpleasant for the foreman, who has been told that if he cannot get along without so many complaints that there would be a change of foremen.

For the last five years I have dispensed with the services of interpreters in gangs of foreign laborers, after which I found that trouble with the men is minimized and greater efficiency is apparent.—Railway Engineering and Maintenance of Way.

Dominion Government Railway to Hudson Bay.

Hon. F. Cochrane, Minister of Railways, left Winnipeg August 9 for Selkirk, whence he took a steamboat for the head of navigation and thence on to Norway House. From this point it was arranged that he should travel by canoe to Port Nelson, to investigate the suitability of that port as a terminus of the railway under construction from Le Pas. At Port Nelson, the Dominion Government steamship Nelson was to be in readiness to convey the Minister to Fort Churchill the other port named as a possible terminal. The Minister was then expected to travel by the Stanley to Halifax, N.S., to reach there Sept. 7. Prior to starting out Mr. Cochrane said he expected to be able to determine as the result of his trip, which of the two ports would be used as the terminus of the line.

Tenders have been invited to Sept. 12, 1912, for the completion of the line to Hudson Bay, contractors being asked to give prices for the work both to Port Nelson and to Fort Churchill. The object of this is the Minister explained that it will then be possible for the contractors to get to work during the winter.

Winnipeg press reports state that the contract for the second section of 68 miles ending near Split lake, will be let to J. D. McArthur Co., which firm has the contract for the first section out of Le Pas. The dispatch says that the approval of the cabinet only is required to close up the matter. Split Lake is the point at which the surveys for the line diverge either to Port Nelson or to Fort Churchill, and it is from this point that contractors are asked to submit prices to both the suggested terminal points.

At a meeting of the Privy Council in Ottawa, held Aug 15, the tender of J. D. McArthur Co., was accepted for the building of the line from Thicket Portage to near Split Lake, 68 miles. The estimated cost of the work is $1,825,000. The J. D. McArthur Co. is building the first portion of the line.

Electric Railway Department

Montreal Tramways Company's Report.

The following report for the period, Oct. 1, 1911 to June 30, 1912, was presented by the President, E. A. Robert, at the annual meeting in Montreal, Aug. 6:—

Gross earnings		$4,355,403.57
Operating expenses		2,618,943.65
Net earnings		$1,736,459.92
From which deduct:—		
City percentage on earnings	$279,030.17	
Interest bonds and loans	449,513.67	
Interest debenture stock	600,000.00	
Taxes	50,850.00	
		1,379,393.84
Surplus		$ 357,066.08
From which has been appropriated for:—		
Contingent account		150,000.00
Transferred to general surplus		$207,066.08

In view of the amalgamation of the Montreal St. Ry. Co., and its subsidiary companies under the name of the Montreal Tramways Co., the figures submitted cannot very well be compared with the same period last year, but your directors are pleased to state that the increase in gross earnings has been very satisfactory, and the ratio of operating expenses to earnings is also satisfactory.

Your directors have appropriated from surplus, $150,000 for contingent account, this being in addition to $85,000 appropriated for the same purpose during the above period, making a total credit to this account of $235,000, against which has been charged the sum of $107,351.87, leaving a balance at the credit of this account of $127,648.13.

During the above period $741,427.68 has been expended on capital account.

Your directors considered it advisable to insure the company's properties against fire, and the amount previously at the credit of the fire insurance fund, amounting to $576,329.83, has been transferred to special capital reserve, which will be used as the directors may decide in the interest of the company.

During the past year the company secured an amendment to its charter whereby certain agreements and deeds of sale with the Montreal St. Ry. Co. and other companies were ratified. The town of Montreal West has granted an exclusive franchise to the company for 50 years.

The company reports that under the Imperial Privy Council judgment, the judgment rendered by the Board of Railway Commissioners with regard to through traffic and rates of fares in Mount Royal Ward was dismissed.

There are now only a few shares of the Montreal St. Ry. which have not been exchanged for this company's securities.

The property has been maintained in a proper state of efficiency, and a considerable sum has been spent in the upkeep of the tracks and rolling stock; the power plant and buildings are in excellent condition. The company has continued its liberal policy towards its employes in respect to wages, having increased them during the year. Owing to the continued rapid growth and congestion of the city your directors have been in negotiation with the city for the purpose of making a new contract which would be more applicable to the present day conditions.

In conclusion, your directors desire to place on record their appreciation of the valuable and faithful services rendered by its officers and employes.

STATISTICAL STATEMENT.

Operating expenses	$2,618,943.65
Operating expenses	$2,611,943.65
Net earnings	$1,736,459.92
Expenses per cent. of earnings	60.13
Passengers carried	104,458,960
Car earnings per passenger	4.06
Transfers	34,947,315
Total passengers carried	139,406,275
Car earnings per passenger total carried	3.04

GENERAL BALANCE SHEET.

ASSETS.

Cost of road and equipment		$32,143,280.93
New construction		741,427.68
		$32,884,708.61
Accounts receivable	$ 107,074.20	
Stores	410,115.90	
Cash and trust funds:—		
Underlying securities redemption fund	1,147,000.00	
Cash	58,162.68	
		1,722,352.78
Investments		495,000.00
		$35,102,061.39

LIABILITIES.

Capital stock common	$ 2,000,700.00	
Capital stock debentures*	16,000,000.00	
First and refunding 5% mortgage gold bonds due July 1, 1914	10,445,000.00	
Underlying bonds:—		
4½% due Aug. 1922	681,333.33	
4½% due May 1922	1,500,000.00	
4½% due May 1922	2,238,666.67	
Mortgages	6,863.00	
		$32,872,563.00
Accounts and wages payable	$ 332,895.95	
Accrued interest	241,125.00	
Accrued tax on earnings	292,992.28	
Employes' securities	21,242.28	
Unclaimed dividends	1,956.57	
Unredeemed tickets	119,348.19	
Suspense account	308,894.08	
		1,318,454.35
Contingent account	$ 127,648.13	
Surplus	207,066.08	
		334,714.21
Special capital reserve		576,329.83
		$35,102,061.39

*This includes the amount due on shares not yet exchanged.

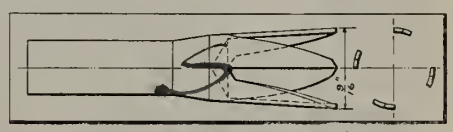
Nothing but routine business took place at the meeting, the report being adopted unanimously, and the officers being re-elected for the current year, as follows:— President, E. A. Robert; Vice President, J. W. McConnell; other directors, F. H. Wilson, Hon. J. M. Wilson, W. C. Finley, J. M. McIntyre, and G. G. Foster, K.C.

Underground Electric Railway Project for Montreal.

A letter was read at the Montreal city council meeting, Aug. 1, signed by A. E. Forget, Secretary of the Comptoir Financier Franco-Canadian, stating that a French syndicate, possessed of ample means, was about to apply for a franchise for an underground electric tramway system in the city. The letter set out that the company was actively engaged in preparing plans for the construction of an underground system of electric tramways, similar to those already in operation in Paris, France. Application would be made for parliamentary powers next session, and if the privileges sought were granted work would be started within two years. The proposed company would have a capital of $100,000,000, which was to be furnished by a syndicate of French bankers. The members of the provisional company include M. J. Girard, M.P.; E. Lapointe, A. E. Forget and J. B. Charbonneau. Accompanying the letter was a draft-project, which the aldermen were invited to examine. In this project it was stated the company desired a 50 years' agreement, with powers of renewal. First and second class cars to be run on the underground trains. First class tickets to be eight cents each, and second class tickets four cents. Workmen's tickets to be sold at two cents each, good during certain hours. Trains to consist of five coaches, one of first class and four of second class, each coach holding about 110 passengers. The letter was referred to the board of control.

Cutter for Taper Plugs at the Halifax Electric Tramway Co.'s Shops.

Taper wooden plugs for filling up holes and recesses over the heads of bolts in various parts of the car body, are a very much needed article in a street car repair shop. The Halifax Electric Tramway Co. is no exception, save in so far as the method of making the plugs is concerned, for D. B. Logan, Foreman Machinist, has devised a method that is both unique and good. A cutter of the form indicated in the accompany illustration forms the basis of the method. This cutter is gripped in a drill chuck in the head of a small speed lathe, giving the cutter thereby a high enough speed to satisfactorily cut wood. A piece of board of a thickness slightly over twice the depth of the required finish plug forms the stocks from which the plugs are to be made. This block is held on its rear surface against the spindle of the lathe stock, by



Cutter for Making Taper Plugs.

which it can readily be brought up to the rapidly revolving cutter. The particular lathe in use has a lever operated tail stock spindle, and in consequence, the spindle movement for bringing the work up to the cutter is particularly quick in action. The operator, holding the block of wood in one hand, with the other brings the tail stock spindle forward against the block, forcing it against the cutter until the latter has entered to about half its full depth. This operation is repeated very rapidly all over the face of the block. The block is then reversed, and the same operation repeated on that face, aligning the cuts as closely as possible to those made from the reverse side. This operation completes the cutting out of double taper pins, slightly over twice the length of the pins required. Running a saw cutter across the centre of these double pins, leaves them complete and ready for driving into the holes to be plugged. These plugs can be produced very rapidly by this method.

Electric Railway Regulation in British Columbia.

Under the authority of the Tramway Inspection Act, the Attorney General of British Columbia has issued regulations governing the operation of electric cars within the province. The new regulations, among other things, call for the installation of gates at the rear of all cars, which will be the only way of entrance and egress; the gates are to be under the control of the conductor; they are to be closed before the car starts, and are not to be opened until the car stops again. When a car is filled to capacity, which is to be fixed, no more passengers will be allowed on under penalty. The lowest step on each car is not to be more than 16 inches above the ground; on interurban cars a separate compartment must be provided for baggage and mail; provision is made for the standardizing of cars, and single truck cars are to be done away with as speedily as possible. All new cars are to be approved by the Inspector under the Tramway Inspection Act. All employes are to undergo an examination and eye test. The regulations which cover a number of other detail matters, come into force at once. The companies affected, the B. C. Electric Ry. and the Nelson Tramway Co., are given until the end of the year to make the required alterations in the cars.

Electric Railway Projects, Construction, Betterments, Etc.

British Columbia Electric Ry.—A. T. Goward, Local Manager, Victoria, is reported as stating Aug. 5, that the whole of the route for the Saanich line had been cleared, the greater portion of the grading done, and the track material delivered. It was expected to have track laid on the 22 miles in a couple of months, and to have the line opened by Jan. 1, 1913. The second track work on Hillside Ave., was well advanced, and the other betterments in the city were being progressed with satisfactorily. (Aug., pg. 421.)

Dunnville, Wellandport and Beamsville Electric Ry.—Press reports state that financial arrangements have been made for the completion and operation of the section of the line from Dunnville to St. Ann's, Ont. The directorate is stated to be in course of reorganization, and will in future consist of three representatives of St. Catharines' interests, and one each representing Toronto and Welland. (June pg. 308.)

Hamilton, Ont.—Press reports state that a project is under consideration for the building of a new incline railway to carry street cars to the top of the mountain. V. T. F. Webb, Hamilton, is reported to be interested.

Lake Erie and Northern Ry.—J. Muir, President, is reported as stating on his return to Brantford, Ont., Aug. 2, from Montreal, that the financing of the company had been arranged for, and that tenders for the building of the line would be called for immediately. Montreal press reports, Aug. 2, state that a meeting of directors was held in that city on the previous day, when an agreement was concluded with G. W. Farrel & Co. for the purchase of the entire issue of $1,100,000 of 5% first mortgage bonds.

The annual meeting of shareholders will be held in Brantford, Ont., Sept. 4.

We were officially advised Aug. 19, that all of the tenders had not been received for the building of the line from Port Dover, via Brantford, to Galt. It is expected that these will be in and the contract let early in September. The northern portion of the line from Brantford to Galt will be put under construction first and it is hoped to have it completed this year.

Some changes were made in the directorate at the recent meeting of shareholders in Montreal. The board is now constituted as follows:— J. Muir, H. Cockshutt, L. Harris, J. Saunderson, Brantford, Ont.; R. Thompson, Paris, Ont.; F. H. Deacon, Toronto; Mr. Todd, Galt, Ont.; G. W. Farrell, Montreal.

Lethbridge Municipal Ry.—General Superintendent Reid reported, Aug. 8, that two of the cars had been delivered, and three more were on the way. He expected to be able to start the cars running Aug. 15, although the municipal power plant would not be ready for some time. The track construction work is in charge of Superintendent Doughty, and the overhead work in charge of W. Symonds. (Aug., pg. 421.)

Moncton Tramways, Electricity and Gas Co.—E. B. Reeser, President, is reported as stating that an arrangement has been made with the Moncton and Buctouche Ry., by which the company's cars will be run over the M. and B. Ry. as far as Humphreys. In order to carry out this agreement it will be necessary to extend the track from King St., along Harbor St. to the railway tracks. This work will be started as soon as the agreement is ratified. The city loop line will be completed in the fall, and should business warrant it, a summer park will be laid out in 1913.

Press report state that permission has been given the company to extend its John St. line to the Intercolonial Ry. shops, and that the work will be gone on with immediately. (July, pg. 367.)

Montreal and Southern Counties Ry.—The Board of Railway Commissioners has approved location plans for the extension from Ronelagh to the boundary between Longueil and Laprairie parishes. (Aug., pg. 421.)

Montreal Tramways Co.—Pending the completion of plans for the improvement and extension of the lines in the city, the company has started work on the renewal of 38 street intersections. Long ties are being used, so that four of the rails are tied together, thus providing the greatest possible stability. The rails are 132 lbs., instead of 96 to 116 lbs. formerly used. The concrete work and ballasting is being done by M. J. Stack and Co. J. D. Evans, Chief Engineer, is in charge of the work. (Aug., pg. 421.)

Morrisburg and Ottawa Electric Ry.—At a meeting of shareholders in Ottawa, Aug. 29, the directors asked for authority to complete arrangements for starting construction. Three proposals for securing an entrance into Ottawa were submitted for consideration. The directors are understood to have reported that the plans for financing construction were in a forward condition. Jas. Oliver is President, and R. A. Bishop, secretary. The company's offices have been moved from Morewood, Ont., to Ottawa. (June, pg. 309.)

Ontario West Shore Ry.—The position of the municipalities in connection with the guaranteed bonds of this partially built line was considered at a meeting held in Kincardine, July 24, when a committee was appointed to take some action. J. W. Moyes, Toronto, the promoter of the line, was present at a meeting of the committee, Aug. 1, at which a sub-committee was appointed to interview the Provincial Government to ascertain if a subsidy could be obtained to enable the line to be completed as a municipal undertaking, and to ask the Ontario Railway and Municipal Board to make an investigation as to the expenditure of the money secured for the bonds issued for principal and interest of which the municipalities are liable under their guarantees. (Mar., pg. 148.)

Ottawa and St. Lawrence Electric Ry. A meeting of shareholders was called to be held in Ottawa, Aug. 28, for the purpose of electing directors, perfecting the organization of the company and for the transaction of general business. J. E. Askwith, is chairman, and F. Iveson is secretary of the provisional directorate. (July, pg. 368.)

Ottawa, Rideau Lakes and Kingston Ry.—We are officially advised that as soon as the surveys for this projected line are completed, which it is expected will be early in Sept., the final details of the general contract for construction will be worked out. This general contract was arranged with British financiers in March, and covers the building and equipment of a line from Ottawa to Kingston, with a branch from near Lombardy, crossing the river at Rideau ferry, and proceeding thence to Perth, Bolderson and Lanark. The main line and branch will have a total length of 127 miles. The line will open up a territory that is at present almost without railway facilities. It is not probable that any construction will be done this season, but it is hoped to make a start early in the spring of 1913. U. L. Upson, Ottawa, is General Manager (Aug., pg. 421.)

Port Arthur and Fort William Electric Ry.—The Port Arthur, Ont., city council passed a resolution June 30, adopting the route for the proposed belt line in the city. The construction is to be done under the superintendence of the chief engineer, and it is expected to have the new line in operation by the winter.

The Fort William, Ont., city council has decided to order the materials for the laying of street railway tracks on Pacific Ave., Walsh and Franklin streets, and on Island 2. (Aug., pg. 421.)

Quebec Ry., Light and Power Co.—Track has been laid on Dorchester St. as far as the approaches of the proposed Drouin bridge, on the extension to Limoiiou. As soon as the bridge is built, tracklaying will be restarted on the extension.

A number of improvements have been made at the St. Paul St. station, Montmorency division. A shed covering three platforms and four tracks has been provided, and an additional long track has been set apart for the pilgrimage traffic to St. Anne. (June, pg. 310.)

The Sarnia Street Ry. is erecting a new car barn. It is to be finished in the fall, and is estimated to cost about $12,000. It will be 160½ ft. by 78 ft. 8 in. and will be built of solid blocks of concrete with prepared roofing. There will be five tracks the entire length of the building, giving a capacity of 15 cars, with two pits, one 90 ft. long, the other 150 ft. A workshop will be provided on the south side of the building, with a paint shop 38½ ft. by 59 ft. On the south weste corner of the building there will be a superintendent's office and store room, with lavatory accommodation for employes. The machinery in the present shops will be utiiized in the new one. (Aug., pg. 421.)

Simcoe Ry. and Power Co.—Press reports state that the company has under consideration plans for the building of an electric railway along its power transmission line from the Big Chute on the Severn river to Waubashene, Ont., for the construction of which the Ontario Legislature last session granted an extension of time. (Mar., pg. 149.)

Toronto Eastern Ry.—We are officially advised that considerable grading has been done on this line by the several subcontractors. No further subcontracts have been let.

The spur under construction from the Canadian Northern Ontario Ry. into Oshawa, Ont., is being built by the C. N. O. Ry. It will be operated by steam until the completion of the T. E. Ry., when it is probable that it will be operated electrically in conjunction with that line. (Aug. pg. 422).

Toronto Suburban Ry.—The grading of the branch from Weston to Woodbridge, Ont., is practically completed, and it is expected to have the track laid in about a month. On the extension from Lambton to Gueiph. W. Maher started work just west of Islington, and has the grading well advanced to Summerville, near where the line will be carried under Dundas st. No further subcontracts have been let. Right of way agents are at work at various points as far as Guelph, to which point the line is under contract to Ewen Mackenzie. (Aug. pg. 422).

The Montreal Tramways Company and Its Employes.

The Montreal Tramways Co. has voluntarily increased its employes wages, the new scale, which has been put in force will date from July 1, the commencement of the financial year, under the present management.

The comparative rates of pay are as follows:

	Old rate.	New rate.
First and second year men	20c.	21c.
Third to fifth year men	21c.	22c.
Five years and over	22c.	24c.

On the whole, some 2,200 empioyes about $100,000 a year. We are advised that the empioyes are well satisfied with the new rate.

The Board of Railway Commissioners has asked railway companies to furnish a statement of the number of passenger cars they have, heated by stoves, and to what service assigned.

Automatic Signals on the Hudson Valley Railway.

By G. W. Davison, Superintendent of Line Construction.

The Hudson Valley Ry. at Glens Falls, N.Y., crosses the Hudson River from Main St. by a single track block, which block is used both ways by two local lines, each three times per hour, and one interurban every hour, 14 regular cars therefore passing hourly; the running time through it being 2¼ minutes. Express, line cars, and electric locomotives drawing freight cars pass over the track, all this varied traffic on the block being protected by the Nachod Automatic signal type C, made by the Nachod Signal Co. of Philadelphia. These signals are located at the end of the single track block, and operate through a single line wire by the passage of cars under trolley contactors. The power to actuate the signals is derived from the trolley circuit, and no insulated rail joints or other disturbance to the track is required. Fig. 1 is a view of the signal at the north end of the block, neatly mounted on a bracket attached by pole bands to a tubular iron pole. The signals are normally neutral, showing neither lights nor discs. When a car runs under the contactor to take the block, the opposing signal at the other end of the block is set at stop, a red light and a red disc, and the signal in sight of the motorman changes to permissive, a white light and a white disc, as an evidence of

Fig. 2. Trolley Contactors, Hudson Valley Railway Automatic Signal System.

this. An opposing movement to the car in the block is thereby prevented, but following movements are permitted. Should another car enter the block before the first has left, warning of the presence of the first car will previously have been given by the permissive signal. When the first car leaves the block, the signals will not be changed, but will be held until the second leaves also. Fifteen cars, if desired, may thus occupy this block under signal protection. The arrangement is such that the second car if desired, might have backed out of the block without passing through the same, such an operation as might be caused by the line car following the regular car.

The trolley contactors are hung on the wire at the double track ends. The the flexible contact strips, opening them somewhat and diverting a temporary current from them to the relay, thereby causing a change of signal indication. Fig. 2 shows them installed at Glens Falls. These contactors are without moving parts, operate at high speed, and require no maintenance. They are hung at one end only on the span wire, thus being free from any line stress, and are attached to the trolley wire by the usual ears. They are connected by vertical leads from two span wires across the street, and considerably higher than the trolley wire, so that, should the wheel fly off, it cannot cut the connections.

The relay in the signal, including both coils and contacts, is immersed in a tank of transformer oil, the high insulation of which prevents lightning troubles, cools the coils, protects the electrical contacts, and in general conduces to extremely low maintenance.

Access is most conveniently had to the signal relay when necessary, by lowering the entire signal box to the ground without disconnecting the leads. By taking out three bolts, and drawing up on the block and tackle, the hood and relay may be raised for repair or inspection, leaving the oil tank on the ground.

The British Columbia Electric Ry. Co.'s Franchises.

The negotiations initiated by the Vancouver Board of Trade with the company in respect to its differences with the various municipalities spoken of as Greater Vancouver, are reported to have made considerable progress. It is desired

Fig. 1. Automatic Signal on the Hudson Valley Railway.

to bring about an extension of the boundaries of the city of Vancouver so as to include a number of outside municipalities, and as the company has franchises in most of them, with varying terms to run, an endeavor was made to secure a surrender of these, and the framing of a new charter to cover the whole area. The discussion to this end became complicated by legal proceedings in connection with some of the franchises, and the stopping of services on the lines in consequence. On the breaking off of negotiations so far as the Vancouver city council was concerned, the business men took the matter up, with the result that a modus vivendi is likely to be arrived at. The matter is now before the directors in London, Eng., and R. H. Sperling, General Manager, left Vancouver Aug. 8, to discuss the various matters with them.

The Montreal Tramways Co. is reported to be building, at its shops, two cars for the conveyance of prisoners between the courts and the jail. The cars, it is stated, will be built entirely of steel, and completely closed in, being largely an adaptation of the present style of prison van as an electric car. The cars, which will be the Government's property, will be in charge of a motorman and conductor of the company, and there will be two guards in attendance. A special switch is to be built at the court house, and also at the jail at Bordeaux.

Electric Railway Finance, Meetings, Etc.

Berlin and Waterloo St. Ry.—Profits on operation for July, $2,135.03. Number of passengers carried, 96,511, an increase of 28% over July, 1911.

British Columbia Electric Ry., Vancouver Power Co.—Gross earnings for June, $498,306; operating expenses $317,840; net operating earnings $180,466; renewal funds $37,935; net earnings $142,531; approximate income from investments, $25,000; net income $167,531, against $387,664 gross earnings; $252,819 operating expenses; $134,845 net operating earnings; $29,770 renewal funds; $105,075 net earnings; $20,000 approximate income from investments; $125,075 net income for June 1911. Aggregate gross earnings for 12 months ended June 30, $5,749,649; net earnings $2,004,631, against $4,226,834 aggregate gross earnings; $1,589,784 net earnings for same period 1910-11.

Calgary Municipal Ry. — Passenger earnings for July, $57,770 20; miscellaneous earnings, $1,007.90; total earnings, $58,778.10; operating expenses, $33,725.36; net operating earnings, $25,052.74; contingent account, interest, etc., $8,202.23; net profit, $16,850.51, against $38,301.90 passenger earnings; $845.85 miscellaneous earnings; $39,147.75 total earnings; $15,187.22 operating expenses, $23,960.53 net operating earnings; $7,220.71 contingent account, interest, etc.; $16,739.82 net profit for July, 1911.

Cape Breton Electric Co.—Gross earnings for June, $29,448.22; operating expenses and taxes $16,791.57; net earnings $12,656.65; interest charges $4,495.84; balance $8,160.81; sinking and improvement funds $1,206.67; balance for reserves, etc., $6,954.14, against $27,426.61 gross earnings; $15,538.20 operating expenses and taxes; $11,888.41 net earnings; $4,512.50 interest charges; $7,375.91 balance; $1,131.66 sinking and improvement funds; $6,244.25 balance for reserves, etc. The construction charges during June, were $1,544.17.

Halifax Electric Tramway.—Railway receipts for June, $21,435.18; July, $24,563.81, against $19,498.63 for June, and $23,821.28 for July, 1911.

Hamilton St. Ry.—Gross receipts for quarter ended June 30, $134,567.27, against $111,285.40 for same period, 1911. City percentage of earnings, $10,765.38, against $8,902.84 for same period, 1911.

Quebec Ry. Light, Heat and Power Co.—A press report from Quebec states that the report for the financial year, recently closed, which will be issued shortly, will show gross earnings of $1,565,000, compared with $1,280,126 for the previous year; also that the operating expenses will show an increase, from $661,907 to $733,000, and the net earnings, from $618,219 to $832,000.

Toronto Ry., Toronto and York Radial Ry., Toronto Power Co., Etc.—Gross earnings for June, $696,980; working expenses, maintenance, etc., $357,365; net earnings $339,615, against $634,275 gross earnings; $300,351 working expenses, maintenance, etc.; $333,924 net earnings, for June 1911. Aggregate gross earnings for six months ended June 30, $4,012,718; net earnings $2,036,072 against $3,568,293 aggregate gross earnings; $1,805,205 net earnings from same period 1911.

Winnipeg Electric Ry.—Gross earnings for June, $300,402; working expenses $150,090; net earnings $150,312, against $305,353 gross earnings; $141,251 working expenses; $164, 102 net earnings, for June 1911. Aggregate gross earnings for six months ended June 30, $1,808,703; net earnings $841,129, against $1,881,605 aggregate gross earnings; $925,550 net earnings, for same period 1911.

The Halifax Electric Tramway Co. has ordered four box cars from the Nova Scotia Car Works, for delivery in the fall.

Electric Railway Notes.

The Manitoba Public Utilities Commission has under the provisions of section 42 of the Public Utilities Act of 1912, issued the rules of practice to be observed in all proceedings before it.

G. R. G. Conway, Chief Engineer, British Columbia Electric Ry., is also acting General Manager during R. H. Sperling's absence in England, which will probably continue until towards the end of this year.

We are officially advised that the position of manager of the Transportation and Sales Departments, British Columbia Electric Ry., Vancouver, left vacant by the recent resignation of Jas. Roosevelt, has not been filled.

M. J. Kennedy, General Freight Agent, Montreal Tramways Co., has resigned, intending to devote his time to the Montreal Tunnel Co., in which he is associated with D. McDonald, ex-General Manager, Montreal Tramways Co.

It is reported from Winnipeg that the Winnipeg Electric Ry. has selected R. S. Kelsch M., Can. Soc. C. E., of Montreal, as its expert to adjust matters with the Winnipeg city council, in connection with the joint use of poles, etc.

During June, one employe was killed, and five were injured in the course of their work in connection with Canadian electric railways. The fatality was due to the conductor being pulled from his car, his clothing having caught in a wire fence.

The Lethbridge Municipal Ry. has received five double truck city cars from the Preston Car and Coach Co. They are mounted on 27-G-1 trucks, with Westinghouse 101 B.2 motors, for single end operation, with pay-as-you-enter vestibule on rear end.

H. E. Smith comptroller Montreal Tramway Co., has been elected a director of the Efficiency Society of New York, an organization for promoting efficiency in commercial, financial and industrial enterprises of all kinds, including public service corporations.

W. D. Power, heretofore freight expert for the Vancouver board of trade, has been appointed general freight and passenger agent, British Columbia Electric Ry., in charge of all freight and passenger tariffs, preparation of cases for the Board of Railway Commission, etc.

D. McDonald, on retiring recently from the position of General Manager of the Montreal Tramways Co., addressed a letter to the company's officials and employes in which he thanked them for the way in which they had co-operated with him in his many years of service with the company.

J. B. Ingersoll, heretofore Electrical Engineer, British Columbia Electric Ry., Vancouver, who recently resigned, as mentioned in our last issue, has assumed his new duties in charge of the work of the Kootenai Power and Construction Co., in installing a 40,000 h.p. plant at Kootenai Falls, Idaho.

The Berlin and Waterloo St. Ry., which is owned by the city of Berlin, Ont., has decided to provide new uniforms for its employes, and has adopted the following increased scale of wages:—First six months, 16c. an hour; second six months, 17c. an hour; second year, 17½c. an hour; third year, 19½c. an hour; fourth year, 20½c. an hour.

The Quebec Railway, Light and Power Co. has, according to press reports, increased its conductors' and motormen's pay. It is said that employes with eight years service to their credit will receive one cent increase an hour, and those in the service twelve years two cents an hour. Other demands made by the men were not considered.

The Guelph Radial Ry. has ordered a snow sweeper from the Preston Car and Coach Co. It will be of the single truck type, with double end operation, with 33 ins. brooms. The motor equipment will consist of two Westinghouse 101B2 motors with K10 controllers, and one 101B motor with K10 controller to operate the brooms. It will be delivered about the middle of October.

Arthur Reid, General Superintendent of light, power and the street railway of Lethbridge, Alta., returned from Boston, Mass., recently, where he had been attending the American Institute of Electrical Engineers' convention. Press reports stated that he was also on a tour for the inspection and purchase of additional street railway equipment and machinery, but we are officially advised that the city is not, at present, in the market for such.

The Galt, Preston and Hespeler St. Ry. has received two double truck interurban cars, from the Preston Car and Coach Co. They are mounted on Baldwin trucks, with steel tired wheels, and equipped with Westinghouse 93A motors,

P297 F. D. Burpee,
Superintendent and Purchasing Agent, Ottawa Electric Ry., Ottawa.

multiple unit control, Westinghouse AMM air brakes, and steel underframes. The interior finish of the passenger compartment is inlaid mahogany, and of the smoking compartment, quartered oak, empire finish throughout, with arc lamps.

D. Miller, Superintendent, Hamilton Street Ry., was charged in the Hamilton, Ont., police court, Aug. 2, on complaint of R. McNeil, a former employe, with violating sec. 3 of the Ontario Act which regulates the hours which street railway motormen and conductors shall work. The charge was withdrawn, as it had been ascertained that no action could be taken by a private individual under the Act unless the consent of the Ontario Railway and Municipal Board had previously been obtained.

H. Weeks, a passenger on one of the Halifax Electric Tramway Co.'s cars, was fined $15 and costs, recently, for using abusive language to a conductor for not giving him a transfer as speedily as desired. On behalf of the company, it was stated that the man had been abusive to other conductors, and the company intended to take action in all similar cases, as the conductors were placed in such a position that they could not resent the treatment except by bringing the offenders before the court.

J. E. Hutcheson, before leaving Ottawa recently to assume the General Managership of the Montreal Tramways Co., was entertained by his fellow members of the Laurentian Club and presented with a very handsome gold mounted clock and a silver model of an electric car. The function was attended by a large number of Ottawa's principal citizens, and all the speakers highly eulogized the recipient. The Ottawa Electric Railway Co.'s directors adopted a resolution expressing their appreciation of Mr. Hutcheson's great services to the company, and presented him with a cheque for a substantial amount.

The Registrar of Joint Stock Companies for British Columbia has given notice under sub-sec. 3, sec. 268 of the Companies Act that the following companies have been struck off the register, but are given one month from July 25 to obtain re-registration if necessary:—Vancouver Electric Ry. and Light Co.; Vancouver and Lulu Island Electrical Ry. and Improvement Co., registered under the Act of 1878; The National Electric Tramway and Lighting Co.; Chilliwack Tramway Co.; Vancouver and Westminster Electric Tramway and Light Co., registered under the Act of 1890; Nelson Electric Tramway Co., registered under the Companies Act of 1897.

The British Columbia Electric Ry. recently gave its employes, with their families, a two-days' picnic at Hastings Park, Vancouver. Over 6,000 persons were the guests, the company providing all the entertainment, including a programme of sports. R. H. Sperling, General Manager, presented a perpetual challenge cup for a tug of war, and the Conway perpetual challenge cup for linemen was well contested for. The test consisted of the climbing of a 45-ft. pole, going over the arm, returning to the ground, and repeating the performance at another similar pole 30 ft. away. The contest was won by the New Westminster team, one of its members performing the feat in 52 2-5 secs., creating a new record on the coast.

Double Deck Electric Railway Car.—The New York Railways Co. is experimenting with a double deck car on its street railways. The car, which has been made from special designs, is 44 ft. 10 ins. long and 8 ft, 3 ins. wide, with the upper deck shorter than the lower one. The entrance is in the middle at the side of the car, and the floor of the lower deck is about 10 ins. above the pavement. The stairways to the upper deck are inside the car at each end, and the upper seats are arranged in two rows longitudinally, back to back. The car has seating capacity for 88 passengers and a maximum capacity for 171 passengers. The weight of the car per seated passenger is given as less than 500 lbs. The head room on the lower deck is for the most part, 7½ ft., and for the upper deck, 6 ft. 1in. The car is equipped with an air brake and provision is made for increasing the brake power in proportion to the weight of the car load. The doors are opened and closed by compressed air, the arrangement being controlled by a foot lever next the seat occupied by the conductor, opposite the entrance to the car, where he sits to take fares. We are given to understand that Canadian street railways are not much interested in the matter, as it is believed that such cars are not suitable for city operation.

Nipissing Central Ry.—Tracklaying and ballasting is reported to be well advanced on the extension of the line from Haileybury to New Liskeard, Ont. It is expected that the extension will be fully completed and in operation by Oct. 1.

Calgary Municipal Railway.

The report of the Calgary Municipal Ry. operations for the year ended June 30, shows—

Gross earnings		$479,240.24
Operating expenses		282,600.56
Net operating earnings		$196,639.68
Taxes, (real property)	$ 2,264.18	
Interest	45,000.00	
Sinking fund	18,160.00	
Contingent fund, 5% of gross revenue	23,962.01	89,386.19
Net profits		$107,253.49

The operating expenses include—Way and structures, $9,946.12; equipment, $44,934.14; transportation, purchased power, $74,272.72; operation of cars, $136,404.27; general expenses, $17,043.31. The proportion of operating expenses to revenue, was 59.44%. Amount paid to employes, in wages, $172,251.75. The value of the property is given in the report, in detail, as follows:—

Engineering	$ 4,055.40
Track construction	901,622.29
Line construction	94,551.77
Buildings	24,317.85
Shop tools and machinery	2,145.65
Cars	205,431.15
Electric equipment	59,318.50
Miscellaneous	639.56
	$1,292,082.17

The following statistical information is also given:—car miles 1,643,328; car hours, 195,206; passengers carried, 11,578,130; transfers, 1,262,400; total passengers carried, 12;941,530; average fare, 4.076c.; average fare, including transfers, 3.615c.; car earnings per car mile, 28.722c.; miscellaneous earnings per car mile, 0.440c.; gross earnings per car mile, 299.162c.; car earnings per car hour, $2.41; gross earnings per car hour, $2.45; miscellaneous earnings per car hour, 0.04c.; operating expenses per car mile, 17.196c.; operating expenses per car hour, $1.44.

The total length of road, computed as single track, is 53 miles, made up as follows:—First main track 42 miles, second main track 10 miles, sidings and turnouts one mile. There are 49 passenger cars owned, 48 of which are closed; four work cars, and two sprinklers.

During the year one passenger was injured, and three persons were killed in accidents.

Killing Weeds with Water Gas Tar.

The Conestoga Traction Company, of Lancaster, Pa., has 162 miles of track, covering the city and practically the whole of Lancaster county. It has been found that sprinkling with water tar is effective in laying dust, as well as entirely removing weeds, and is believed to have additional value in preserving ties. The cost of the treatment is stated to be $60 to $65 a mile, about 3,000 gals. of tar being required per mile, and the cost of the tar being 2 cents a gallon at the holder. Tank cars, holding 1,000 gals., are used, built by placing a tank 4 ft. in diameter and 15 ft. long on an old truck. The sprinkler consists of a 2 in. iron pipe, the length of a tie, capped at the ends and attached to the tank by two adjustable rods, permitting raising and lowering. A hose attachment to the tank outlet gives flexibility. Three rows of staggered 3/16 in. holes are bored in the sprinkler, except over the rails, where blank spaces are left to prevent tar from getting on the rails. A 2 in. wire flue brush on a ⅜ in. pipe is run through the sprinkler occasionally to clear out dirt which collects on it. It is expected that one application of the tar to the roadway will last two years. The tar carries a slight odor of gas, it is stated, which soon disappears.

MISS S. E. STORY, eldest daughter of D. A. Story, General Freight Agent, Intercolonial Ry., Moncton, N.B., was married in Toronto, Aug. 26, to C. S. Clark, of Moncton.

National Steel Car Company Limited.

This company has been incorporated under the Dominion Companies Act, as stated in Canadian Railway and Marine World for August. Following are extracts from the prospectus issued in connection with the sale of stock.

The capitalization is $3,000,000 of 7 per cent cumulative preference stock, of which $1,500,000 is being issued now and $3,000,000 of common stock, of which $2,000,000 is being issued. The preference stock is being sold to the public at 98, with a bonus of 60 per cent. of common stock. The directors are Sir John Gibson, Lieutenant-Governor of Ontario; J. J. Scott, K.C.; and W. Southam, Hamilton, Ont. Sir Henry Pellatt, Toronto; C. H. Cahan, K.C.; Mortimer Davis, W. G. Ross, Montreal; W. W. Brice, W. B. Parsons, M. H. Coggeshall, New York; Basil Magor, President, Magor Car Co., Passaic, N.J. The head office is in Montreal and the plant is to be built in Hamilton, Ont.

It is pointed out that the present car building facilities in Canada are inadequate to supply the railways' growing demands, and that existing plants are behind in their orders and that a large number of cars are of necessity imported from the United States despite the heavy customs duty.

As a large portion of the materials used in building freight cars are of necessity imported from Pittsburgh and the Mississippi Valley, Hamilton was selected as the best point for manufacturing and it is claimed that the saving in freight, over any other point considered, should, when the plant is working to 60 per cent. capacity, equal three-quarters of the preferred dividend.

The plant, which has been designed by Barclay, Parsons and Klapp, New York, will have a large ultimate capacity, property has been bought and construction has been started on the first portion which will have a full capacity of 30 cars a day. The cost of the plant is estimated as follows:—Buildings, $261,230; machinery, $204,500; property, $100,000; contingencies and engineering, $84,000; total, $649,730.

Based upon the earnings of the car plants in Canada and the U. S., and the actual earnings of the Magor Car Co., of Passaic, N.J., in particular, and without taking into consideration the advantageous location of the new plant, the following estimated earnings in the average year are submitted by the management for a capacity of 30 cars per day or 9,000 a year. Average operation 60% of capacity, 5,400 cars average profit of 8% net on gross business, $400,000. 7% preference stock dividend, $105,000. Available for common dividend, $295,000. Or 14¾% on common stock.

In 1908, previous to the consolidation, the Canada Car Co., with a daily capacity of 25 cars, showed earnings of over $445,000, and the Dominion Car and Foundry Co., with a capacity of 30 cars, earned over $414,000. A careful study of the earnings of car plants in Canada and the U. S. for a perlod of years, would indicate that the estimate of $400,000 in the average year is conservative. In order to cover the preferred dividend it will be necessary for the new company to earn but slightly more than a quarter of this amount, which is well within the minimum earnings which the management anticipates even in years of serious depression.

The Magor Car Co. for 11 months ended March 31, showed a trading profit of 37% for the full year as the actual fit of 37% for the full year on the actual was one of depression in the car business in the U.S., with very keen competition.

The company will be managed by Basil Magor, who is resigning the presidency of the Magor Car Co., believing in the greater possibilities for business in Canada. His former superintendent at Passaic will be associated with him. A. Butze, formerly General Purchasing Agent, Grand Trunk and Grand Trunk Pacific railways, has been appointed Assistant Secretary and Purchasing Agent.

Among the Express Companies.

J. B. Dickey has been appointed agent, Dominion Ex. Co., Revelstoke, B.C., vice J. L. Stark.

D. Doody has been appointed route agent, Dominion Ex. Co., with headquarters at Montreal.

H. J. Berry has been appointed agent, Canadian Northern Ex. Co., Emerson, Man., vice R. D. Carlow.

J. W. Herbert has been appointed agent, Canadian Northern Ex. Co., Regina, Sask., vice W. A. Best, transferred.

Z. M. Middleton has been appointed chief clerk to Superintendent, Canadian Northern Ex. Co., Winnipeg, vice G. S. Jackson, promoted.

The Canadian Northern Ex. Co. has opened offices at Antar, Briercrest, Mistatim and Waseca, Sask., and Athabasca Landing and Clyde, Alta.

G. S. Jackson, heretofore chief clerk to Superintendent, Canadian Northern Ex. Co., Winnipeg, has been appointed route agent, Winnipeg, vice W. F. Pillar, transferred to Edmonton, Alta.

E. M. English, heretofore financial agent, American Ex. Co., Montreal, has been appointed Assistant Manager of the company's Eastern Financial Department, New York, and A. B. Howard has been appointed financial agent at Montreal, to succeed him.

C. A. Roach, who was recently appointed route agent, Canadian Ex. Co., Montreal, was entertained to dinner and presented with a club bag, by a number of his friends and associates at Cornwall, Ont., Aug. 13, on his leaving the company's local office for Montreal.

The Canadian Ex. Co. has opened offices at Birch, Wyebridge and Picton, Ont., and has extended its service to the steamboat line between Napanee and Picton, Ont., and on the Grand Trunk Pacific Ry. to Mirton, 56 miles west of Edson, Alta. Offices will be opened at Bickedike and Makanum.

The British Columbia Express Co. recently made an offer to purchase the old stage coa h Stampede, but the owners are expecting to realize a high price for the coach as a relic than the company is willing to give for it for ordinary use. In these days of steam and electric railways it is interesting to know that this company has in operation over 30 stage coaches carrying mail and express matter through central British Columbia and right up to the Cariboo district.

C.P.R. Scholarships at McGill University.—Two of the scholarships which the C.P.R. offers for employes under 21 years of age, and for minor sons of employes, recently became vacant. One has been secured by E. A. Leslie, son of J. Leslie, Assistant Comptroller, and the other by W. J. Shrimpton, son of F. E. Shrimpton, Auditor of Disbursements.

Prior to the adjournment of the British House of Commons, Aug. 7, the Postmaster General announced that the Government contract with the Marconi Wireless Telegraph Co. provided that the Government supply $3,000,000 for the erection of five wireless stations, Australia supplying $500,000 for one station, thus forming a wireless telegraph circuit round the world. He also stated that the Government was unable to undertake the construction itself, and the company named was the only one with the necessary experience and plant to carry out the scheme.

Marine Department

The Thousand Island Steamboat Co.'s New Vessel.

The steamboat Thousand Islander, which was delivered to the Thousand Island Steamboat Co. in July, and which has been taken over by the Richelieu and Ontario Navigation Co., with the rest of the T.I.S.B. Co.'s fleet, has the following dimensions:—

Length over all, 172 ft. 9 ins.; beam moulded, 32 ft.; depth moulded, 9 ft. 6 ins.; gross tonnage, 355; net tonnage, 241.

She is of the tunnel stern, shallow draught, twin screw type, and consists of main, promenade and boat decks. There is life saving equipment for 1,000 passengers, included in which are three 18 ft. life boats and one 14 ft. working boat. All decks, cabins, etc., above the main deck are constructed of wood, and the part below the main deck is of steel.

The hold is arranged for chain locker, crews quarters and power plant. From frame 1 to 16 there is accommodation for four firemen and seven deck hands. There are staterooms from frame 16 to 26 for souvenir boys, mess boy, bartender, cook and assistant, two waiters, oiler, watchmen and steward. The two boilers and engines, together with the auxiliaries, take up the space from frame 26 to 55. The space from frame 55 to 66 is occupied by 14 people, including the chief engineer, assistant engineer and electrician. All berths are of metal, and the quarters are finished in redwood.

On the main deck a hand capstan windlass occupies the space as far aft as frame 7. From frame 7 to 12 space is taken up by the mens' toilet, which is finished in redwood. The bar room is finished in chestnut and leads as far aft as frame 19. Access to the toilet and bar room is maintained by a 3 ft. passage extending along the port side of the ship forward from frame 19 and terminating in the windlass room. This passage is finished in oak. The deck from frame 19 to 43 is clear, with the exception of the boiler casing, which is 14 ft. wide and extends from frame 26 aft to 44. The upper part of the boiler casing forward is cut away to make room for the stairs leading from the premenade to the main deck. The forward gangways extend on each side of the ship from frame 22 to 25. This part of the ship is finished in oak. The ship is coaled through five 20 in. scuttles, placed between frames 26 and 42. The starboard side of the ship from frame 43 to 54 is taken up by the galley, which extends from the ship's side to the engine hatch coaming. A passage is left between the galley and boiler casing to connect with an athwartship passage between the forward engine hatch coaming and the after boiler casing, making a clear passage from port to starboard 42 ins. wide. This passage in turn connects with a fore and aft passage on the port side leading from the main deck amidships to the social hall aft. The ladies' lavatory on the port side, extending from frame 43 to 56, communicates with this passage. The engine hatch is 13 ft. wide and extends from frame 46 aft to 54. The social hall extending from frame 54 to 62, includes the stairs leading from the main to the promenade deck, while gangways take up the space from frame 56 to 59. The breakfast room, extending from frame 62 aft to the stern includes the linen room on the starboard side and the purser's room on the port. The breakfast room is finished in quartered oak and cortains 20 tables with redwood tops. The purser's room, linen room, galley and ladies' lavatory are finished in redwood, while the social hall is finished in mahogany.

The promenade deck extends from stem to stern and is clear but for a closed cabin 19 ft. wide which extends from frame 19 to 62. The forward end of this cabin contains the stairs leading to the main deck, while a stack casing 7½ ft. wide extends from frame 31 to 41. The after end of the cabin is taken up by a stairs leading to the social hall on the main deck and by a souvenir counter placed in the extreme end. The deck is supported amidships by the boiler casing, which in turn, is given additional strength. Forward and aft of the boiler casing I beam stringers, in connection with gas pipe stanchions, are used in giving support to the deck, while the space between the promenade and main deck is built up of wood. The deck itself is of ⅞ in. pine, covered with canvas and supported by 4¾ x 1⅞ in. pine beams, spaced 24 ins. centre to centre. The deck is enclosed by an oak rail 1 ¾ x 5 ins., supported at equal intervals by oak stanchions, the whole being enclosed by galvanized wire iron work. Window stools and sashes of cabin windows are of mahogany, the cabin exterior is finished in redwood and the interior in white pine covered with white enamel. The souvenir stand is of mahogany, together with the newell posts of stairways and the wood finish around the pipe stanchions.

The Thousand Island Steamboat Co.'s Steamboat, Thousand Islander.

The boat deck extends from frame 17 aft to the extreme stern. The deck forward carries the usual pilot house and chart room, together with accommodations for the captain, owner, maid and mate. The stack casing, 7½ ft. wide, extends from frame 31 to 41. Aft of frame 42 there are four life boats. The stairs leading to the promenade deck are located between frames 72 and 75. The entire deck is enclosed by a ¾ in. pipe railing about 2 ft. 9 ins. above the deck, supported by ¾ in. pipe stanchions placed at 5 ft. intervals. The support for the deck is arranged in the same manner as the promenade deck. The deck is of ⅞ in. pine, covered with canvas. The beams are of pine, 1⅜ x 4¾, spaced 25 ins. centre to centre, the camber being 6½ in. in 32 ft. The texas is finished in redwood and the sash for the windows is mahogany.

THE STEEL HULL.—The hull is divided into six compartments by transverse bulkheads, three being watertight and two non-watertight. The peak bulkhead at frame 6 is made up of 10 lb. plate, stiffened in a vertical direction by 3½ x 2½ x 6.1 lb. angles and in a horizontal direction by 2½ x 2½ x 4.1 lb. angles. The plating of watertight bulkheads at 26 and 66 runs from 12½ lbs. per sq. ft. below to 6 lbs. above. Horizontal and vertical stiffeners are all 2½ x 2½ x 4.1 lbs. The bulkhead at frame 44 is non-watertight and separates the boiler from the engine space. It is built up of 6 lb. plate stiffened vertically by 2½ x 2½ x 4.1 lb. angles and horizontally by 3½ x 2½ x 7.2 lb. angles. The engine space is separated from the after hold by a non-watertight bulkhead at frame 55; it is built up of 14 b.w.g. plate and stiffened vertically and horizontally by 2½ x 2½ x 4.1 lb. Double angles are used in connecting the watertight bulkheads to the shell, while single angles are used for those that are non-watertight. Diamond shaped liners are fitted to all bulkheads in way of outside strakes of plating. There are two coal bunkers placed on opposite sides of the ship and having doors that open into the fire hold. The starboard bunker extends from frame 36 to 44 and the port bunker from 26 to 35. The bunkers are built up of 6 lb. plate stiffened vertically by 2½ x 2½ x 4.1 lb. angles spaced 24 ins. keel to keel. The boiler casing consists of 6 lb. flanged plate built up from 10 lb. coamings. The plates are flanged the necessary depth to do away with the angle stiffeners. The shell plating includes the garboard strake of 11 lbs. fore and aft, bilge and bottom plate 10 lb. fore and aft. Strake next below the sheer strake 11 lbs. fore and aft, while the sheer strake is 12 lbs. for ⅔ length amidships reduced to 11 lbs. at the ends. The keel plate is flat, being 30 ins. wide by 15 lbs. fore and aft, and worked in lengths of not less than seven frames spaces. The butts are double rivetted; a single inside 18 lb. strap being fitted extending to the garboard edge laps. The garboard bottom and bilge strakes are butt lapped, double riveted, with ⅝ in. rivets. The side and sheer strakes are butt lapped, double

rivetted with ¾ in. rivets. The fore and aft edge laps of the garboard and sheer strakes are double rivetted, the remainder are single rivetted. The under body of the boat is sheathed with rock elm, 2½ ins. thick. The sheathing extends from between frames 15 and 16 to frames 66 and 67 and extends upward to the turn of the bilge. After the shell plating had been caulked, the wood sheathing was fastened in place by means of bolts and nuts and the bottom was then caulked in the usual manner. The floors, 12 ins. deep, are solid on every frame, being formed of 10 lb. plates, with the exception of the engine and boiler space, where they are increased to 14 lbs. Deep floors are provided for the engine space and also for the ends of the ship. The frames are formed of 3 x 2½ x 4.5 lb. angles and spaced 24 ins. keel to keel. The reverse frames forward and aft of the engine and boiler space are 2½ x 2½ x 4.1 lb. angles extending alternately to the main deck stringer plate and to the upper turn of the bilge. In the engine and boiler space they are increased to 5 lb., and all extend to the main deck stringer plate, while additional reverse frames are fitted for the length of the floors.

There are two longitudinal keelsons on each side of the centre line, worked Intercostal between solid floors on each frame. The longitudinals are formed of 10 lb. vertical plates, the lower edges being flanged and rivetted to the shell, while the top edges are rivetted to a 6 in. x 10.5 lb. channel, which extends fore and aft over the tops of the floors to which it is attached by angle clips.

The channels are continuous fore and aft, and are not cut in the way of bulkheads. Bracket connections are made at all the bulkheads besides the necessary watertight construction. The longitudinals are carried as far forward as practicable and as far aft as the stern, where they help to stiffen the roof of the tunnel.

The bilge and side stringers are formed of a 6 in. x 10.5 lb. channel, connected to the frames by 2½ x 2½ x 4.1 lb. clips. The channels are slotted in way of the frames and cut at the bulkheads to which they are attached by suitable brackets. The outer flange of the channel is connected directly to the shell, while the channel itself is fastened to the frames by angle clips. At the stem the stringers are connected by 10 lb. plate breast hooks together with the necessary angles.

The foundation for the engines is formed mainly of four longitudinal girder plates each of 10 lb. intercostal, between the floors, to which they are attached by means of double angles 2½ x 2½ x 4.1 lbs. The girder plate itself extends to the shell to which it is connected thereto. The rider plates are continuous and formed of 20 lb. plates, 15¾ ins. wide connected to the floor plates and longitudinals, thereby tying the whole together.

There are two saddles for each boiler, consisting of 14 lb. plate and double angles 3 x 3 x 7.2 lbs. The fore and aft saddles for each boiler are connected by 14 lb. plate girders to which they are connected by 2½ x 2½ x 5 lb. angles.

The main decks beams are of angle steel 5 x 3 x 8.2 lbs. placed on every frame to which they are connected by 10 lb. gusset plates 15 x 15 ins. The camber is 6ins. in 32 ft. The main deck stringer plates are 18 ins. x 10 lbs. for two thirds length amidships reduced to 8 lbs. at the ends. They are fitted close to the sheer strake plating and connected thereto by a 6 in. x 14.52 lb. Z bar. The top edge of the sheer strake is flanged outward to receive the lower flange of the Z bar while the deck stringer is connected to the upper flange of the bar.

The only plating on the main deck, other than that of the main deck stringer, is that due to the reinforcement of hatch openings in the way of boiler and engine space and stairways. The main deck is of pitch pine 2¼ ins. thick x 3¾ ins. wide, laid in long lengths, and well fastened to the beams and plating by ½ in. diar. cheese head, square necked, galvanized bolts and nuts. An oak fender, strake 6 x 8 ins. is placed on a line with the main deck and extends around the stern to as far forward as the stem.

THE MACHINERY.—There are two main engines of the two cylinder, vertical, direct acting compound type, well balanced and each capable of developing about 500 h.p. at 200 revolutions a minute, from a steam pressure of 150 lbs. per square inch.

The sequence of cylinders, beginning forward, is high pressure and low pressure, with diameters, respectively, 15 and 30 ins. and a common stroke of 20 ins.

The main engines are placed 8 ft. apart in a single engine room without a centre line bulkhead, the starting platform being conveniently located between the engines, with ample space for the engine crew to work. The cylinders are fitted with safety valves in the bottom and covers. From the centre of the engines to the centre of propeller is 62½ ft.

The cranks are set at 90 degrees. The high pressure cylinder has one piston valve 9 ft. in diar., while the low pressure cylinder has a flat, double ported slide valve 28 ins. wide and 24 ins. long, the valve travel in each case being 4¼ ins.

The valves are operated by Stephenson's link motion, through overhung double bar links, with motion derived from eccentrics keyed to the crank shaft. The valve gear is so adjusted that the mean cut-off in full gear will be about 66¾% in the high pressure cylinder, and 56¼% in the low pressure cylinder. The point of cut-off will be variable by means of slotted reverse arms. The pins on the links for the attachment of the eccentric rods are 24¼ ins. centre to centre, the full throw of the links being 12 ins.

The high pressure eccentric sheaves are of cast iron and made in one piece, while the low pressure sheaves are made in halves. The straps for all the eccentrics are of cast iron and made in halves, the bearing surface in each being 2¼ in. wide. The distance from the centre of the shaft to the centre of the links is 50½ ins.

The valve stems in all cases are 1½ ins. diar. through the valves, 2 ins. through the stuffing boxes and 2¼ ins. at the guides. The piston rods are each 3¼ ins. diar. The framing of each engine consists of two cast iron I section columns at the front and two cast iron box section columns at the back.

The bed plates are of cast iron and contain three bearings each. The exhaust passage from the high to the low pressure cylinder is formed by an 8 in. extra heavy steel pipe, bent to the arc of a circle and connected by flanges to the upper facing of the steam chests.

From the inboard side of each low pressure steam chest a steel exhaust pipe leads to a cast iron fitting bolted directly to the condenser, which is common for both engines. Each exhaust pipe is of 11 ins. diar. at the cylinder and 12 ins. at the condenser.

The high pressure pistons are of cast iron, fitted with cast iron plugs arranged for water grooves. The low pressure pistons are of cast steel fitted with the usual arrangement of cast iron follower, and two spring rings in each piston. All pistons have a depth of 4½ ins.

The crossheads are of cast steel with pins 4 ins diar. by 5½ ins. long. Brass slippers are fitted for both ahead and astern thrusts. The slipper for the ahead thrust is 10 ins. wide by 12 ins. long, while the combined width of the slippers for the astern thrust is ins. with a length of 12 ins.

The crosshead backing guides of L section are made of cast iron and bolted directly to the back columns.

The connecting rods which are 45 ins. centre to centre, having a diameter at the crosshead end of 3¼ ins., and 3¾ ins. at the crank end. The crosshead end has a single connection, and the adjustment for wear at that end is taken up by means of a wedge, while at the crank end a bolt connection is used.

The crank shafts are each made in one forging with a coupling disc 14½ ins. diar. by 1⅞ ins. thick at one end. The length over all is 7 ft. 1½ ins.

The journals are 6¾ ins. diar., while the crank pins are 6¾ ins. by 8 ins. long.

The crank webs are 7¾ ins. wide by 4¾ ins. thick. Opposite each crank slab a tail piece is forged, to which the cast iron counterbalances are bolted. The counterbalances are of sufficient weight to take care of the reciprocating as well as the rotating weights. Each thrust shaft is 6¾ ins. diar. and 3 ft. 7 ins. over all, being fitted with four collars 13 ins. diar. by 1⅜ ins. thick and 3½ ins. apart. A coupling disc is forged on each end 14½ ins. diar. by 1⅞ ins. thick.

There are two intermediate shafts for each engine, 6 ¾ ins. diar. by 12 ft. 9¼ ins. long and coupling discs forged at each end. The tail shaft is 7¼ ins. diar. in the bearings and 6¾ ins. diar. between the bearings and at the ends. Length over all is 30 ft. 3 5/16 ins. A cast iron coupling dics 18¾ ins. diar., is shrunk on the forward end.

Each crank shaft has three bearings, 6¾ ins. diar., two being 8 ins. long and one 11¾ ins. The thrust bearings consist of cast iron pedestals, fitted with three cast iron horse shoe collars lined with white metal in each pedestal.

The intermediate shafting for each engine is carried by two spring bearings made of cast iron, the lower halves being lined with white metal.

Each propeller shaft is supported at the outboard strut and also in the stern tube by a bearing at each end. The bearing in the strut consists of a brass sleeve 22 ins. long, carrying wood strips of lignum vitæ. The after bearing in the stern tube is a duplicate of the strut bearing, while the bearing at the inboard end consists of a brass sleeve.

The stern tube is made of two cast iron sleeves connected by a standard steel pipe 9 ins. diar. The after sleeve is made to fit a cast steel boss rivetted to the shell of the ship, while the inboard end is flanged to receive the after collision bulkhead. The over all length of stern tube is 14 ft. 5 ins. There are two propellers of cast iron, solid, three bladed, and made to the right and left hand. The diameter of each wheel is 6 ft, while the pitch is 9 ft. The developed area for one wheel is 14 ½ sq. ft. The propellers rotate outboard.

AUXILIARY MACHINERY.

All auxiliary machinery is placed below the main deck with the exception of the dynamo and hand deck pump, which are placed on the main deck.

REVERSING GEAR.—A steam cylinder 7 ins. diar., and 12 ins. stroke, is used for reversing each engine and is bolted directly to its respective front column. A slide valve of cast iron governs the action of this cylinder.

AIR PUMP AND JET CONDENSER.—A single acting, independent, vertical air pump and jet condenser is fitted, having one steam cylinder, 12 ins. diar., placed directly over the air chamber 24 ins. diar., with a common stroke of 18 ins. The diameter of the injection pipe is 5 ins. while the overboard discharge pipe of the air pump is 10 ins. The air pump is placed athwartship, the centre being 9 ft. 5 ins. aft of the centre of the engine. the base resting upon the ship floors.

THE FEED WATER HEATER is located on the starboard side on the forward engine room bulkhead and uses the auxiliary exhaust steam. It is a film feed water heater consisting of eight spirally corrugated tubes 2⅜ ins. diar. by 46 ins. long.

FEED PUMP.—There is one 10 x 6½ x 12

independent, simplex, plunger, horizontal feed pump. It is located on the port side of the engine room and has a discharge of 2½ ins. diar., while the suction connects with a 4 ln. two valve manifold which draws from the hot well and sea.

GENERAL SERVICE PUMP.—There is one 8 x 5 x 12 independent, duplex, plunger, horizontal general service pump placed on the starboard side of the ship. The suction of this pump is connected to a 4 in. three valve manifold which draws from the sea, bilge and hot well. The discharge 2½ in. diar. is connected to the general service pump manifold, through which the pump discharges indirectly to the ash gun, fire hose, deck hose, engine hose, condensor, overboard, fresh water tanks, to the boilers through the feed water heater and to the boiler direct through independent lines. A 14½ injector discharges into the after end of this manifold.

FRESH WATER PUMP.—There is one 4 x 4¾ x 5 independent, duplex, piston, horizontal fresh water pump placed on the starboard side of the ship on the forward engine room bulkhead. The suction and discharge are, respectlvely, 2ins. and 1½ ins. The suction and discharge are connected to the fresh water tanks, which are in the boiler room.

SANITARY PUMP.—There is one 5½ x 5 x 5 independent, duplex, piston, horizontal sanitary pump placed on the starboard side of the ship, suction being taken from the sea. The suction and discharge are, respectively, 3 ins. and 2 ins.

BILGE PUMPS.—There are two dependent, horizontal, plunger bilge pumps, 4½ ins. diar. by 4 ins. stroke, each pump deriving its motion from a pin driven into the forward end of the crank shaft. The pump body is bolted to the outboard side of the bed plate of each engine, the suction 3 ins. diar., is connected to the bilge, while the water is discharged through two 2½ in. pipes directly overboard.

STEERING ENGINE.—There ls a double cylinder 5 x 5½ steering engine, steam and hand combined, on the port side of the ship, connecting with the rudder quadrant by chains.

DYNAMO.—There is a 25 kilowatt generator direct connected to a steam turbine, which furnishes current for lighting the ship. This outfit is placed on the main deck, starboard side, just aft the engine platform. The switchboard is placed on the port side near the entrance to the engine platform; the whole being within the engine well.

The distribution of lights is as follows:—

BOAT DECK.	MAIN DECK.
10— 8 c.p.	57— 8 c.p.
5—16 c.p.	45—16 c.p.
4—32 c.p. Signal Lights.	HOLD.
PROMENADE DECK.	37— 8 c.p.
76— 8 c.p.	36—16 c.p.
8—16 c.p.	

THE FAN AND ENGINE used in connection with the forced draught for the boilers is placed on the port side of the engine room at the forward engine room bulkhead. The 5 x 5 high pressure engine is direct connected to a no. 6. fan. board side of the ship, on the forward side of the coal bunker bulkhead. This gun consists of the hopper into which the ashes are thrown and discharged over-

THE ASH GUN is placed at the starboard through a 7 in. extra heavy pipe, check valve and a deflector which is riveted to the side of the ship. A water jet at the top and bottom of the gun furnishes the necessary power to discharge the ashes.

HAND PUMP.—There is one vertical, duplex, plunger hand pump, required by the U.S. laws, placed on the main deck, aft. Each cylinder is 4¾ ins. diar, with a stroke of 6 ins, making a total capacity for each cylinder 106 cu. in.

BOILERS.—Two single ended Scotch boilers of the cylindrical type working at a pressure of 150 lbs. to the square inch are located on the centre line of the ship in one boiler room. The distance between the boilers longitudinally is 9 ft. 9 ins. between the furnace fronts, while each boiler has a separate funnel spaced 12 ft. apart. The funnels are 40 ins. inside diar,, while the outside stacks are 48 ins. diar., the top being 40 ft. 3 ins. above the grates. The boiler aft, projects through the bulkhead between the boilers and engines about 3 ins. There is an exit to the main deck at the forward end of the boiler room. Ventilation for the boiler room is provided by two 24 in. ventilators placed in the centre of the boiler room, the outlets being carried down level with the bottom of the air heater.

The furnaces, two in each boiler, have internal and maximum diameters of 45 ins. and 48-16-16 ins. respectively, the thickness being 15/32 in. The grates are 5½ ft. long, the grate surface of each boiler being 41¼ sq. ft., while the heating ing surface in each boiler is 1713 sq. ft., or a ratio of 41.5 to 1; making for the two boilers an aggregate grate surface of 82.5 sq. ft. and a total heating surface of 3426 sq. ft. The furnaces are of the Morison suspension type, and have independent combustion chambers. The length of the tubes between the tube sheets is 6 ft. 10 3/16 ins., and they are spaced 3½ ins. in a vertical and 3¾ ins. in a horizontal direction. Each boiler contains 326 tubes, of which 44 are stay tubes; all have an outside diameter of 2½ ins., with 10 gauge for the stay tubes and 12 gauge for the ordinary tubes. The tube sheets have a thickness of ⅝ of an inch. The top of the combustion chamber, which is 9/16 of an inch thick. is supported in the usual manner by bridge girders. The boiler shell is 15/16 in. thick.

FORCED DRAUGHT.—The positive forced draught unit consists of a no. 6 fan direct connected to a 5 x 5 high pressure engine. The suction of the fan is taken from the engine room, while the air is discharged, through a 24 x 24 in. galvanized steel pipe to the air heaters, which are studded to the boiler fronts. The suction of the fan has a diameter of 31¾ ins. while the discharge has a sectional area of 576 sq. ins. The air heater for each boiler measures 9 ft. long by 2 ft. 8 ins. wide and 5 ft. 2 ins. deep. Each heater consists of 127 horizontal tubes, whose ends are expanded into steel plate headers, ¼ in. thick. All the tubes are of steel, 2¼ ins. outside diar., 14 gauge and 9 ft. long. The total heating surface for both air heaters is 1346 sq. ft. The operation of the positive draught is such that the burnt gases from the boiler pass on the outside of the air heating tubes, while the fresh air for the furnaces is forced through the tubes, thus abstracting heat from the boiler gases for the benefit of combustion.

The Thousand Islander was-bullt by the Toledo Shipbuilding Co., Toledo, Ohio.

British Columbia-Mexico Steamship Service.

The Pacific Canadian Steamship Co. Ltd., has been formed in Liverpool, Eng., to take over the Canadian Mexican Pacific Steamship Co., which operates a steamship line between Victoria, Vancouver and Salina Cruz, in connection with the Tehuantepec National Ry., which latter crosses the Isthmus of Tehuantepec to Puerto Mexico, on the Gulf of Mexico, where connection is made with the Gulf Transport Line to Europe. The company proposes to establish and maintain the running of a line of steamships between Canadian and Mexican ports, in particular between Vancouver and Salina Cruz, calling at intermediate ports whether in Canada, Mexico or the United States, and at San Francisco, and to adopt an agreement with the Tehuantepec National Ry. The capital stock is mentioned as $100.000, half of which is subscribed by J. H. Welsford and Co., Liverpool, Eng., who either own or control the Gulf Transport Line, the Canadian Mexican Pacific Steamship Co., the Union Steamship Co. of British Columbia, and the Boscowitz Steamship Co., and the remaining half by B. C. Pearson, London, Eng., of Sir W. D. Pearson and Co., who control the Tehuantepec National Ry., and who were the contractors for its construction. It is stated that the steamships Ikalis and Ikala of the Gulf Transport Line will be transferred to the Pacific Canadian service immediately.

The Canadian Mexican Pacific Steamship Co., received a subsidy from the Dominion Government for the service between Vancouver and Salina Cruz, a condition of the agreement being that no calls had to be made at any U. S. port.

New Brunswick-Prince Edward Island Car Ferry Service.

Differing from the usual custom of calling for tenders by advertisement, the Department of Railways and Canals issued a circular letter to vessel builders inviting tenders for the construction and delivery of a steel car ferry for the service on Northumberland Straits between Cape Tormentine, N.B., and Carleton Point, near Cape Traverse, P. E. I. The circular points out that special investigation has been made by Prof. A. K. Kirkpatrick, M. Can. Soc. C. E., of Queen's University, Kingston, Ont., into conditions of ice, currents and weather, and his report also suggests type, dimensions and power of the vessel. The vessel adopted will require to have a deck capacity of 10 loaded freight cars of 80,000 lbs. capacity each, or six passenger cars, each 76 ft. long over all, and must be capable of maintaining a speed of at least 14 miles an hour under load in open water, and be able to negotiate the worst conditions of ice to be encountered in the Straits at a speed of not less than half a mile an hour. The type of vessel suggested by the report would be someting between the design of the Delaware and the Bessemer and Pere Marquette types. It should have an ice crushing bow with bow propeller of special nickel steel and engines of 200 i.h.p. each, belt plating, stiffening deck without camber or sheer at water level, to protect hull against pinching by moving ice floes. Two railway tracks would have to be provided with accommodation for five freight cars each, arranged to be loaded and unloaded over the stern, and with accommodation for passengers as well as crew. This would necessitate a vessel about 280 ft. long, 50 ft. beam and 16 ft. draught light and about 18 ft. draught under full load, which would be able to negotiate any of the ice conditions to be found in the Straits.

Tenders were invited to Aug. 15, and the successful tenderer will be required to deliver the vessel on the route not later than July 1, 1913, free of all charges. In addition to the deposit of 10% of the tender price, the successful tenderer will also be required to enter into a bond or other satisfactory security to the value of the remaining 90% of the tender price, which will be held for 12 months from the date of delivery of the vessel, as an additional security for fulfilment of the specified requirements, more particularly as regards the overcoming of the ice conditions. Payment for the vessel will be made on delivery, provided the requirements of the contract and specifications are then fulfilled, apart from the actual overcoming of the ice conditions.

The contract for the construction of the Government grain elevator at Fort William, has been awarded to the Barnett-McQueen Co. The elevator is to be ready for operation by Sept. 20, 1913. The amount of the tender is said to have been $1,179,503.

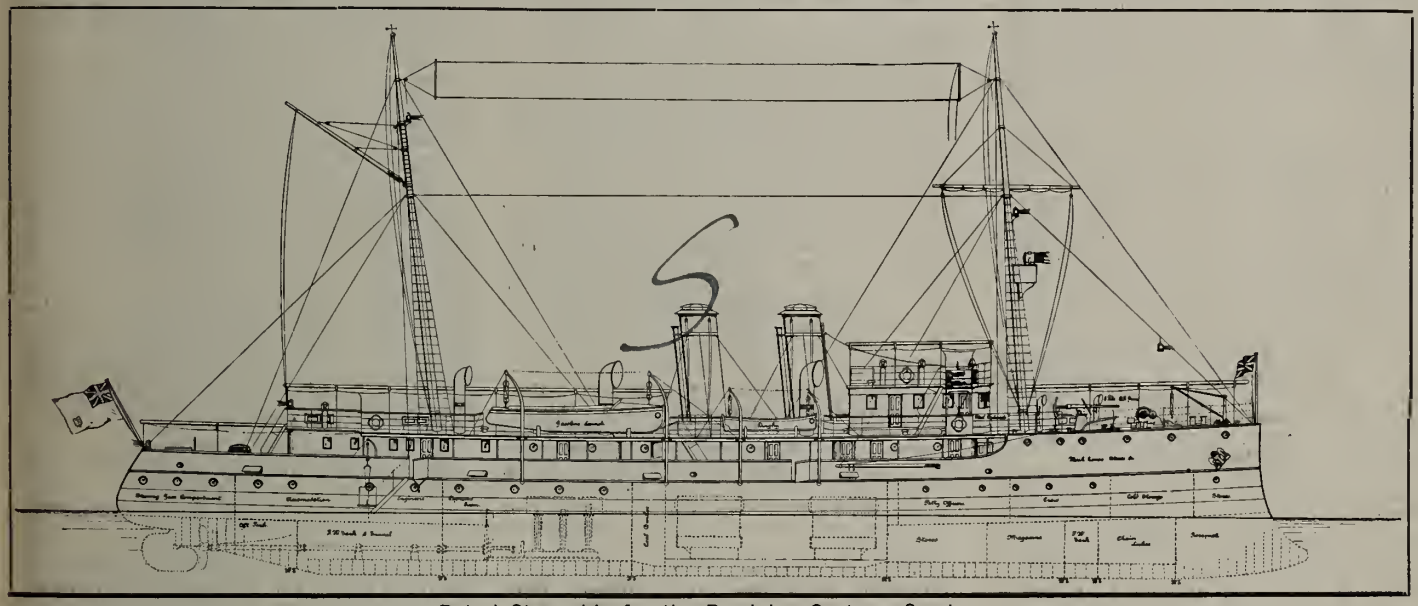
Patrol Steamship for the Dominion Customs Service.

Tenders will be received to Sept. 2, for the construction of a twin screw steel steamboat for the Customs service on the Atlantic coast, to be named Margaret, the profile of which is illustrated on this page.

Following are the principal dimensions, length between perpendiculars, 185 ft.; breadth, moulded, 32 ft.; depth, moulded to main deck, 16 ft.; draught, forward and aft, 10½ ft.; deadweight, 175 tons; coal, full supply, 200 tons; indicated horse power, 2,000; complement, officers and crew, 32; armament, two 6 pounder quick firing guns.

She is to be of steel throughout except where otherwise specified, under Government survey; fitted with water ballast and double bottom; ram stem, cruiser stern and five main transverse water tight bulkheads extending to the main deck.

The machinery is to consist of twin screw triple expansion engines with two Yarrow water tube boilers, working under forced draught. The armament of two 6 pounder quick firing guns will be supplied by the Government. A complete electric lighting installation is to be supplied, including two sets of dynamos and engines, search light, etc. All the auxiliary machinery is to be of the latest improved type, and the Marconi system of wireless telegraphy is to be installed.



Patrol Steamship for the Dominion Customs Service.

Another Lock Gate Accident in the Welland Canal.

An accident to the gates of lock 22, Welland canal, which occurred June 20, was fully described and illustrated in Canadian Railway and Marine World for August. Another accident on this canal happened August 2, this time to lock 23, both the upper and the lower gates being carried away as the result of the collision of a steamer.

The wooden freight steamer Wiley M. Egan, 252.2 ft. long, 39.8 ft. in breadth and 20 ft. deep, with a gross tonnage of 1,677 and a net tonnage of 1,380, built in Cleveland, Ohio, in 1887, and carrying a crew of 17, was bound light from Deseronto to Ashtabula to load coal. She had entered lock 23 under good control. Approaching the upper gates, the captain gave the required bells to reverse and stop. The engineer understood the signal, but was unable to control the advance of the boat, with the result that it crashed into the upper gates (head), carrying them away. The inrushing water from the upper level, locks 23 and 24, carried the boat back some distance, the stern striking the corner of a bridge over a narrow channel which connects the canal prism and the equalizing basin alongside. A hole was punched in the boat, but it was soon repaired, and she did not sink. The protection, or stop, logs along the west bank of the canal prism were washed out into the adjoining embankment, the flood of water also overtopping the same and doing some little damage to the G.T.R. tracks, which run immediately along the base of the embankment. Fortunately, there was no loss of life, as was the case when the government steamboat La Canadienne carried away the gates of lock 22, which is located about 900 ft. below lock 23.

New gates were sent up at once from Port Dalhousie, on Lake Ontario (a supply being kept there all the time), and were installed Aug. 3 The canal was out of commission a comparatively short time. This is the third time this season that the canal has been tied up by accidents to lock gates.

The levels between Port Dalhousie and Thorold, locks 1 to 25, inclusive, are comparatively short ones, the distance being about nine miles. The summit level, however is about 18 miles long. To guard against what might be very serious consequences, a guard-gate is located about 900 ft. south of lock 25, the end of the summit level. This guard-gate is invariably closed whenever the gates of lock 25 are open, as well as at other times when no traffic is passing lock 25, lock tenders being stationed at both places. To regulate the opening and closing of these upper gates, two semaphores are installed, one at each place (guard-gate and lock 25). As the distance between is short, about 900 ft., they can readily be seen by the lock tenders, their operation thus being visual. They are also provided with white and red lights for night work. The opening or closing of the gates operates these semaphores automatically.—E. Lowe in Engineering News.

A press dispatch from Liverpool, Eng., early in August stated that on account of the prevalence of ice in the North Atlantic, steamship companies interested decided that it would be undesirable to revert to the northern track for west bound vessels on Aug. 15, and for east bound vessels on Aug. 24, as had been arranged, and that no change would be made in the routes before Aug. 31.

Empress of Britain-Helvetia Collision.

The formal investigation into the causes of the collision of the C.P.R. s.s. Empress of Britain with the s.s. Helvetia, in the Gulf of St. Lawrence, July 27, when the latter vessel was rammed in a fog, and sank, was held early in August by Capt. H. St. G. Lindsay, Wreck Commissioner, and concurred in by Capts. Clift and Nash, as nautical assessors.

The court found that the Empress of Britain is alone to blame for the collision, inasmuch as the speed at which she was proceeding prior to the accident was excessive, considering the state of the weather at the time. During the investigation exception was taken to the action of the master of the Helvetia when the Empress was sighted, but in view of the close proximity of the two vessels and the speed of the Empress, the court is of opinion that the collision was unavoidable, and also that, as the Helvetia was under a port helm with engines stopped when the Empress was sighted, the master of the Helvetia adopted the best course open to him under the circumstances. The court censures the master of the Empress of Britain, but on account of his previous good record, the skilful manner in which he handled his vessel after the impact, and the efficient way in which steps were taken to rescue the crew of the Helvetia, does not deal with his certificate.

Canadian Notices to Mariners.

The Department of Marine has issued the following:—

56. July 24. 145. Ontario, Lake Ontario, Cobourg harbor, outer portion of central pier carried away, temporary light and buoy, caution. 146. Ontario, Lake Ontario, off mouth of Niagara river, change in position of gas and bell buoy, bell buoy to be established. 147. Ontario, Detroit river, Ballard reef channel, deepening of western half of channel completed, change in position of gas buoys, channel for light draught vessels marked by lighted buoys.

57. July 29. 148. Ontario, Lake Ontario, Toronto harbor, new western entrance, color of front range lighthouse, character of back range light. 149. Ontario, Lake Ontario, Welland canal entrance, Port Dalhousie, front range light improved. 150. Ontario, St. Clair river, Chenal Ecarte, buoy established. 151. Ontario, Lake Huron, north channel, Clapperton island, light improved. 152.

Ontario, Lake Superior, Thunder bay, Port Arthur, light established on Thunder bay elevator wharf, gas buoy placed temporarily at entrance to channel to Thunder bay elevator.

58. July 29. 152. Nova Scotia, south west coast, westward of Cape Sable, Cornwall rock, buoy established. 154. Nova Scotia, North Atlantic Ocean, Sable island, west end, intended change in character of light. 155. Nova Scotia, Cape Breton island, east coast, South Ingonish harbor, light established on breakwater.

59. Aug. 2. 1g6. British Columbia, Vancouver island, east coast, Nanaimo harbor, Newcastle island passage, uncharted rock, buoy established. 157. British Columbia, Strait of Georgia, Malaspina strait, Lund, Ragged islands, change in position of light. 158. British Columbia, Chatham sound, Prince Rupert harbor, Barrett rock, gas buoy replaced by gas and bell buoy.

60. Aug. 7. 159. Prince Edward Island, north coast, Savage harbor, change in position of range lights. 160. New Brunswick, east coast, Miramichi bay, Grandoon flats, dredging. 161. New Brunswick, Chaleur bay, Caraquet harbor, dredging. 162. Newfoundland, east coast, Cape St. Francis, change in fog alarm. 163. England, south coast, Southampton harbor, light buoys established.

61. Aug. 13. 164. British Columbia, Chatham sound, Prince Rupert harbor, Charles point, fog bell established. 165. British Columbia, Queen Charlotte islands, Graham island, north coast, Virago sound and Naden harbor, hydrographic notes.

62. Aug. 14. 166. Ontario, Lake Erie, Pelee passage, Grubb reef gas buoy, color of light. 167. Ontario, St. Clair river, Point Edward, gas buoy withdrawn. 168. Ontario, Lake Huron, north channel off Gibbons point, uncharted shoal located, buoy established. 169. Ontario, Lake Nipissing, South bay, South river mouth, buoys established. 170. United States of America, Lake Superior, Whitefish point, submarine bell established.

63. Aug. 17. 171. New Brunswick, south coast, Bay of Fundy, St. Andrews harbor, changes in buoyage. 172. New Brunswick, north coast, Chaleur bay, Caraquet harbor, change in position of gas buoy. 173. Nova Scotia, south coast, approach to Dover harbor, uncharted shoal southward of Black rock, buoy established. 174. Prince Edward Island, south coast, Northumberland strait, Belle river, buoys established. 175. Quebec, River St. Lawrence, ship channel between Quebec and Montreal, St. Pierre les Becquets to Batiscan, changes in buoyage. 176. Newfoundland, east coast, Ariege bay, existence of shoals.

64. Aug. 20. 177. Ontario, St. Clair river, Sarnia, removal of wreck of steamer Joliet. 178. Ontario, Lake Huron, Goderich, south breakwater under construction. 179. Ontario, Georgian bay, Meaford, change in position of breakwater light, range lights discontinued.

Electrically Propelled Vessels for the Canadian Lake Trade.

The Montreal Transportation Co. has ordered in England, a vessel for the lake and canal trade, which is to be a departure from the customary means of propulsion, in that electricity will be utilized for the purpose, for the first time in a vessel of such size. The machinery will consist of two 300 h.p. high speed Diesel engines, each connected with an alternating current generator and exciter, and on the propeller shaft, just ahead of the thrust block, there will be fitted the armature of a large induction motor running at about 80 r.p.m. The whole of the mechanism will be controlled from the bridge. The vessel will be of the usual Canadian canal size, with a deadweight capacity of 2,400 tons on a 14-ft draught.

The vessel has been designed by John Reid and Co., Montreal and Glasgow, the electrical system to be adopted being invented by H. A. Mavor, Glasgow. J. Reid, stated in Montreal, recently, that the peculiar conditions encountered in Canada in the canal traffic had caused the country to lead the world in experimenting in such matters. The absolute limit of hull capacity had been reached at above 2,200 tons, and as a result the only way to add somewhat to the capacity was to reduce the weight of the engines. Canal boats required very coarse pitch propellers, working at about 80 r.p.m. With the Diesel engines on the vessel Toiler, the propellers run at about 250 r.p.m., and as a result, the vessel is not so well adapted for the Canadian canal traffic as she might have been. With the electric motive power, the proper speed will be easily obtained.

Atlantic and Pacific Ocean Marine.

The Manchester Liners s.s. Manchester Inventor, which collided with an iceberg off Belle Isle, towards the end of July, and went to St. John's, Nfld., for examination and repairs, left the dry dock there, and sailed for Manchester, Eng., Aug. 13.

The Lord Mayor of Bristol, Eng., who was visiting Canada, recently, in connection with the Cabot celebrations, is reported to have stated that the Canadian Northern Steamships Ltd., had promised to arrange a weekly service between Canada and Bristol.

The Allan Line s.s. Corsican, while outward bound, Aug. 12, struck an iceberg in the Belle Isle strait, sustaining some damage to her stem, above the water line. After examination of the damage, the captain decided to proceed on his voyage across the Atlantic, and she arrived at Liverpool, Eng., Aug. 21, in safety.

Announcement is made of the retirement of J. S. Park and N. H. Dunlop from the board of directors of the Allan Line. The former's connection with the company has lasted over 41 years, and it is stated that, as owner of the Park Line, he will still be associated with the shipowning business at Glasgow, Scotland.

The British s.s. Eric bound from Rosario, Argentine, for Quebec, with maize, for J. Richardson and Sons Ltd., went ashore on Sable Island, Aug. 14, and subsequently broke up, becoming a total loss. She was built at Whitby, Eng., in 1892, and was screw driven by triple expansion engines having cylinders 23, 37½ and 61½ ins. diar. by 39 ins. stroke, 235 n.h.p. Her dimensions were, length 312.5 ft., breadth 40.7 ft., depth 21.9 ft., tonnage, 2768 gross, 1788 register.

The Union Steamship Co. of New Zealand's s.s. Niagara, under construction at Glasgow, Scotland, for the Australasia-Canada mail service, was launched there, Aug. 17, the christening ceremony being performed by Mrs. Borden, wife of the Canadian premier. The vessel's dimensions are, length 522½ ft., breadth 66 ft., depth 37½ ft., and she will be about 13,000 tons gross. The equipment will be of the highest and most modern class, and wireless telegraph equipment will be installed. The propelling machinery will be of the combined reciprocating and turbine type, with boilers fitted to burn either coal or liquid fuel, for a speed of 17 knots an hour. A full number of boats and life saving appliances will be provided to serve all passengers and the entire crew, and there will also be a complete electric light installation.

The report of Furness Withy and Co. for the year ended April 30, shows the earnings, including balance brought forward from the previous year, of £768,622 2s. 5d., compared with £564,339 14s. 7d. for the previous year. After paying directors' fees, income tax, etc., there remains £756,121 0s. 3d. The usual half-yearly dividend on preference shares, and the interim dividend on ordinary shares at 5% per annum, were paid Nov. 1, 1911, and there has been transferred to depreciation account, £240,000, leaving an available balance of £430,810 16s. 7d. A bonus of 5% on the ordinary shares was declared, making 10% for the year. The report announces the addition to the company's fleet of the steamships Hochelaga and Lingan, specially built for the coal trade, and leased to the Dominion Coal Co. Description and illustration of these vessels have already appeared in Canadian Railway and Marine World. Announcement is also made that a Diesel engined vessel, named Eavestone, has also been launched for the company.

Maritime Provinces and Newfoundland.

The Crystal Stream Steamship Co. is negotiating for the purchase of an additional steamboat in the U. S., for the St. John-Fredericton route.

The Dominion Atlantic Ry. s.s. Yar-Prince George ran aground on the flats on the eastern side of the channel at Yarmouth, N.S., Aug. 12, and was refloated the next day without damage.

The Dominion Atlantic Ry. s.s. Yarmouth while entering St. John harbor, during a fog, Aug. 12, struck a rock, but was got off again with very little loss of time and practically without damage.

The s.s. Wobun, owned by the Wobun Steamship Co. Ltd., a subsidiary of the Nova Scotia Steel and Coal Co., is reported to have been sold for £17,000. She was built at Greenock, Scotland, in 1902, and has engines with cylinders 19, 31 and 51 ins. diar., by 36 ins. stroke. Her tonnage is 1,551 gross, 990 register.

The Imperial Dry Dock Co. Ltd., which had a charter for the construction and operation of a dry dock at St. John, N.B., has sold all its rights and privileges to Norton Griffiths and Co. Ltd., the contractors for the building of the dry dock and other works at Courtenay Bay, St. John, for $75,000. The Imperial Dry Dock Co. was promoted in 1900, and a certain amount of stock was taken up locally. It is reported that the amount realized by the sale, will pay all expenses, and return the shareholders double the money they paid in.

Province of Quebec Marine.

The Minister of Public Works, at a dinner at Quebec, Aug. 1, stated that if a company was not willing to undertake the construction and operation of the proposed Quebec dry dock, the Government would do so.

It is reported that the Montreal Harbor Commissioners have decided to build three large grain elevators, each with a capacity of 2,500,000 bush. It is stated that they will probably be of re-enforced concrete, but the general details have not been made public.

C. C. Ballantyne, one of the Harbor Commissioners who arrived in Montreal from Great Britain, Aug. 11, stated that the floating dry dock, at the launching of which he was present, might be expected in Montreal about the middle of September. It was being towed across the Atlantic by three powerful tugs.

The Levis Dry Dock Realty Co. Ltd.,

has been incorporated under the Quebec Companies Act, with $100,000 capital, and office at Quebec, to carry on any operations connected with construction generally, and with real estate. The incorporators are, J. Paradis, J. A. Lesage, L. Moraud, A. Savard and R. Pare, Quebec.

Capt. L. A. Demers, harbor master, Montreal, recently stated that because of the new order which he has introduced, to the effect that either a harbor master, or deputy harbor master, must be present at the arrival and departure of each vessel, he expects that a second deputy harbor master will have to be appointed.

The new lighthouse on St. Helens Island, near Montreal, is of re-enforced concrete, the base being 52 ft. square. The tower is 11¾ ft. square at the base, tapering to 6¼ ft. square at the top. The lamp is of the catadioptric type, the light being supplied by vaporized coal oil. It is expected that the structure will be completed early in September. The cost is reported as $21,000.

The Dominion Public Works Department has received tenders for the construction of piers 1 and 2 in connection with the Louise dock extensions. The work includes considerable dredging in the St. Charles river. The north side of the Louise embankment wall will have to be extended 100 ft. further into the river for a length of 500 ft. Pier 2 will be 1,000 ft. long extending from the embankment towards Beauport in line with the breakwater extension, and will be 350 ft. wide with freight sheds built thereon. In connection with pier 3, it is intended to build one half at present, and the other half at some future date. The entire work is estimated to cost over $2,000,000.

The returns for July show that permits to pass through the Lachine canal were issued to 1,064 vessels, against 964 issued in July, 1911. The various commodities passing through the canal during July were, wheat, 2,617,411 bush.; oats, 860,859 bush.; flax, 99,388 bush.; flour, 99,188 bbls.; eggs, 2,645 cases; butter, 1,112 pkgs.; cheese, 43,985 boxes; coal, 98,580 tons; coal, landed on banks, 70,853 tons.

The C.P.R. and the Sincennes-Naughton Line, were each fined $1. by the Montreal Harbor Commissioners, Aug. 1, for breaking bylaws of the port regarding the dumping of refuse in the harbor. Charges against the White Star-Dominion Line and the Richelieu and Ontario Navigation Co., in respect of their steamships Megantic and Saguenay, for passing up the river in front of the harbor at excessive speed, were dismissed, as the defendant companies pointed out that the Harbor Commissioners had no jurisdiction over vessels passing outside the harbor.

Ontario and the Great Lakes.

The steamboat Alexandra, formerly known as Sunbeam, registered at Lindsay, Ont., has had its name changed by order in council to Arthur C.

The gates of lock 23 on the Welland canal, were carried away, Aug. 2, by the Pittsburgh and Erie Coal Co.'s steamboat Wiley M. Egan. Traffic was suspended for the better part of a day, while new gates were rushed up from Port Dalhousie.

Press reports state that the Government will, during the coming winter, build an addition to the Port Colborne elevator, increasing its storage capacity from 800,000 to 2,000,000 bushels. The existing elevator was designed by J. A. Jamieson, Montreal, who has the preparation of plans, etc., for the extension in hand.

The Canadian Interlake Line steamboat Hamiltonian, which was recently built at Port Arthur, for the Montreal and Fort William package freight trade, was put into service early in August, when the company entertained a party of citizens at Hamilton, after which city the boat was named.

The Richelieu and Ontario Navigation Co's steamboat Macassa was taken off the Hamilton route, and placed on a special route, Ang. 28, running between Cobourg, Port Hope, Bowmanville, Oshawa and Toronto, for traffic in connection with the Canadian National Exhibition at Toronto. For similar purpose, the company's steamboat Rochester was run between Oswego and Charlotte, N.Y., and Toronto.

The Superior Elevator Co. Ltd., has been incorporated under the Dominion Companies Act, with $150,000 capital, and office at Winnipeg, to carry on a general grain and elevator and grain warehouse business, and in connection therewith to own and operate steam and other vessels, and carry on a general transportaion business in freight and passengers. The incorporators are, W. L. Parrish, G. N. Heimbecker, F. B. Hamilton, W. J. Dowler and J. T. Haig, Winnipeg.

The U. S. Lake Survey reports the levels of the Great Lakes in feet above tidewater for July, as follows, Superior 602.26; Michigan and Huron 580.48; Erie 572.56; Ontario 247.01. Compared with the average July levels for the past ten years, Superior was 0.34 ft. below; Michigan and Huron 0.60 ft. below; Erie 0.30 ft. below, and Ontario 0.16 ft. above. It was anticipated that Superior. Michigan and Huron would rise about 0.1 ft., and Erie and Ontario about 0.2 ft, during August.

The new steamship, City of Detriot III, which is now in service on Lake Erie, is the largest side wheel passenger steamship in the world. In the history of steamship construction she has only been exceeded once, and that was by the Great Eastern, which was 692 ft long. The Great Eastern, however, was both paddle and screw propelled. The City of Detroit III is 500 ft. over all, 55 ft. broad molded, 100 ft. over the guards, and has a molded depth of 22 ft.

The Department of Marine recently asked for tenders for the removal of the steamboat Douglas which was wrecked near Walkerville, several years ago, and which has been considered to be a menace to navigation. Before being wrecked she was operated between Kingsville, Pelee Island and Walkerville. The barge Monguagon, which ran aground above the Windsor waterworks, about a years ago, is also to be removed. The latter vessel is owned in Detroit, Mich.

With reference to press reports that engineers of the Department of Railways and Canals are preparing plans for the construction of a new canal and lock at Sault Ste. Marie, and that instructions have been issued to go ahead with preparations for the work immediately, we are officially advised that suggestions have been made as to the desirability, in view of the growing traffic at that point, of having further canal accommodation, and that information is being gathered on the subject.

A quick system of handling sacks of flour for loading vessels, is in operation in the upper story of the C.P.R. freight shed at Fort William. An endless belt arrangement, reaching to every part of the upper story, has been set up, and is driven by a motor, the sacks are merely thrown on the belts and conveyed to the exit, where they are sent down a chute to the vessel hold. The arrangement was devised and set up by R. Armstrong, then Superintendent of the Fort William terminals, now Superintendent at Saskatoon, Sask.

An enquiry is being held into the causes of the foundering of the steamboat Adiramled, about six miles from Stony Island, Lake Ontario, in June, while bound to Montreal from Fairhaven, N.Y., with coal. She was built at Cleveland, Ohio, in 1866, and was rebuilt in 1882, at Detroit, Mich. She is equipped with engine of 30 n.h.p., driving a screw, and her dimensions are, length 198 ft., breadth 27.4 ft., depth 10.6 ft.; tonnage, 630 gross, 364 registered. She is owned by M. J. Morris, Montreal, who only recently acquired her from the United States.

An Ottawa press report states that from unofficial advices received there, the U. S. Secretary of War will refuse to allow the proposed Chicago drainage system to take additional water from the Great Lakes. When the matter was up for discussion recently, deputations from all the Dominion marine interests went to Washington, where they pointed out that the effect of the scheme would be to lower the water in all the harbors on the Great Lakes, by six inches at least, while the effect on the St. Lawrence, it was claimed, would be detrimental to Canadian navigation.

It was stated in Canadian and Marine World for August that the coffer dam arrangement used in replacing broken

Sault Ste. Marie Canals Traffic.

The following commerce passed through the Sault Ste. Marie Canals during July, 1912:

Articles			Canadian Canal	U. S. Canal	Total
Copper	Eastbound	Sbort tons	759	15,490	16,249
Grain	"	Bushels	2,470,664	989,130	3,459,794
Building stone	"	Short tons	.....	.....	.....
Flour	"	Barrels	328,800	616,162	944,962
Iron ore	"	Short tons	4,917,378	2,403,363	7,320,741
Pig iron	"	"	3,981	1,733	5,714
Lumber	"	M. ft. b.m.	4,670	100,897	105,567
Silver ore	"	Short tons	.....	.....	.....
Wheat	"	Bushels	4,558,998	3,116,289	7,675,287
General merchandise	"	Short tons	6,150	19,712	25,862
Passengers	"	Number	4,214	4,747	8,961
Coal, bard	Westbound	Short tons	64,141	216,176	280.317
Coal, soft	"	"	404,605	1,861,227	2,265,832
Flour	"	Barrels	.....	.....	.....
Grain	"	Bushels	.....	.....	.....
Manufactured iron	"	Short tons	39,605	53,518	93,123
Iron ore	"	"	.....	.....	.....
Salt	"	Barrels	2,639	69,960	66,599
General merchandise	"	Short tons	99 384	96,033	195,417
Passengers	"	Number	6,044	3,821	9 865
Summary.					
Vessel passages		Number	1,158	2,079	3,237
Registered tonnage		Net	3,797 604	4,437,550	8,235,154
Freight—Eastbound		Sbort tons	5,151,072	2,785,572	7,936,644
" —Westbound		"	608,112	2,236,548	2,844,660
Total freight		"	5,759,184	5,022,120	10.781,304

propeller blades on the Niagara Navigation Co.'s SS. Cayuga was designed by B. W. Folger, ex-General Manager. A letter has been received, stating that the device referred to was invented by Barlow Cumberland, formerly Vice-president, N. N. Co., as a result of experience gained by him with the SS. Campana, and that the coffer dam arrangement referred to was constructed by J. Whalen, formerly the N. N. Co.'s ship carpenter, under Mr. Folger's direction. The Campana, above referred to, was cut in two and taken up from Montreal in 1881 for tht Canada Transit Co., under Mr. Cumberland, to run between Collingwood and Port Arthur, and was the first twin-screw steamship on any of the upper lakes.

Manitoba, Saskatchewan and Alberta.

The Department of the Interior has purchased a ferry steamboat from Grand Trunk Pacific Ry. contractors, for use on the Athabasca river, to maintain a service connecting with Jasper Park as a public convenience.

In connection with the proposal to improve the navigation of the Red river, it is reported that the survey of the portion south of the international boundary is to be taken up at the earliest possible moment, and it is expected to be completed before the severe weather arrives.

The Hudson's Bay Co.'s steamboat, Athabasca River, which was mentioned in our last issue as being under construction at Athabasca Landing, Alta., was launched about the middle of July. The machinery installed was taken from the company's steamboat Hazelton, which has been dismantled.

An Ottawa press report states that engineers of the Public Works Department are at work on the final report in connection with the surveys made for the proposed 6 ft. barge canal between Winnipeg and Edmonton. It is said that the report, with estimates, will be in the Government's possession early In the fall, and that an amount will be placed in the estimates, to cover the preliminary work.

British Columbia and Pacific Coast Marine.

During June, 66 steamships called at Prince Rupert, and during the same period, 65 sailed from the port, a daily average of two arrivals and two departures.

The Swift Steamship Co. has commenced a freight service between Puget Sound ports and Victoria, with its steamboat Neptune. She is 84 ft. long, with tonnage, 235 gross, 176 register.

The Vancouver Portland Cement Co.'s steamship Leona, which recently arrived at Victoria from England, was built at Glasgow, Scotland, in 1884, and is a steel screw, three masted vessel, with one iron deck. She has a cargo capacity of 940 tons, her gross tonnage being 634 tons, and 243 tons net.

A bylaw is under consideration by the West Vancouver council, providing for the borrowing of $120,000 for the purchase of shares in the West Vancouver Ferry Co., thus increasing the company's capital stock to $150,000. The company intends buying additional vessels, and extending its wharf accommodation and facilities.

It is reported that the C.P.R. will build a large slip at Kaslo, for the inauguration of a regular barge service between Kaslo and Nelson, in anticipation of heavy shipments of ore on the completion of the standardization of the Kaslo and Slocan Ry. It is stated that the cars will be run direct on the barges at Kaslo, transferred to the line again at Nelson, when they will be forwarded to Trail.

The Nanaimo Transportation Co., has been organized at Nanaimo, to operate the steamboat Starling, on a daily schedule to Departure bay and Gabriola island. The Starling was built at Port Guichon in 1899, and she is equipped with engine of 2 n.h.p., driving a screw. Her dimensions are, length 30 ft., breadth 9ft., depth 3 ft.; tonnage, 8 tons, gross, 5 tons, register.

Side Streams Navigation Co., Ltd., has been incorporated under the Dominion Companies Act, with $50,000 capital, and office at Dawson, Yukon, to own and operate steam and other vessels, and conduct a general navigation and forwarding business, etc. The incorporators are, S. C. Barrington, J. Raymond, C. F. Merrified, W. H. Barrington and F. E. Allison, Dawson, Yukon.

The Dominion Department of Public Works will receive tenders, to Sept. 5, for the construction of a breakwater in Victoria harbor. Plans may be seen, and forms of tender obtained from the Department's Resident Architect, Victoria, the District Engineer, New Westminster; District Engineer, Toronto; District Engineer, Montreal; District Engineer, Quebec; and at the post office, Vancouver.

While there has been some increase in the insurance rates on some of the vessels operating on the Pacific coast, the rates on the Grand Trunk Pacific Coast Steamship Co.'s vessels have remained as last year. The steamships Prince Rupert and Prince George, which are valued at $450,000 each, pay 5¼%, the Prince John, valued at $75,000, 8-2/5%, and the Prince Albert, 9 guineas on a value of $65,000.

W. P. Anderson, Chief Engineer, Department of Marine, in a recent interview at Vancouver, on his return from a tour of inspection of the northern waters of British Columbia, is reported to have stated that he had been looking into the question of improving the aids to navigation, and that he would advise the establishing of an acetylene beacon mounted on a screw pile foundation on Rose spit, on the north east coast of Graham island, the most northern of the Queen Charlotte group.

A press dispatch from Victoria states that the C.P.R. is negotiating for the sale of its steamboat City of Nanaimo. She was taken from the service last year, and has since been lying idle at Esquimalt. She was built at Vancouver in 1891, and after operating for some years between Vancouver, New Westminster and Nanaimo, she was bought by Jas. Dunsmuir, and operated with the steamboat Joan, until both were disposed of to the C.P.R. The engine is of 58 n.h.p., driving a screw. Her dimensions are, length 159 ft., breadth 32 ft., depth 9.4 ft.; tonnage, 761 gross, 518 register.

Electric Traction will supplant steam on the Boston-Providence section of the New York, New Haven & Hartford Rd. This is the third section to be so operated, and it will form part of a New York-Boston electric trunk line; the New York terminal zone, extending to Stamford, Conn., is already under operation, and an extension of the single-phase equipment to New Haven is under way. The work involves four tracking, grade reduction, and grade-crossing elimination. There will be a power house at Providence. The cost is estimated at about $7,000,000. Only a small portion of the Boston South station and yard will be equipped at present.

G. T. Pacific Ry. Maintenance of Way Employes.—A new schedule of wages for these employes which has been arranged by M. Donaldson, Vice President, and General Manager, has been accepted by the employes and is now operative. The minimum wage of a section man is $2 a day. Section foremen receive a minimum of $79 a month.

Wireless Telegraph Alarm Bell.

A London cablegram says that in testifying at the Titanic enquiry, recently, G. Marconi described a new wireless invention for the safety of vessels. He said he had been working on it since the Titanic disaster. "My idea is," he said, "to make wireless apparatus ring a bell and thereby give warning that there is a ship in distress and in need of assistance. This can be done by a sequence of waves lasting fifteen to thirty seconds, which will cause the bell to give a prolonged ring. Some tests of the apparatus have been made, and I have considerable confidence that it can be employed."

A Proposed Trans-Atlantic Service.

While the Dominion Premier and other members of the cabinet were in England, recently, an interview was arranged by those interested in the proposal made some years ago to establish a fast steamship service between the west coast of Ireland and Halifax, N.S. Sir Thomas Troubridge explained that the company was organized in 1906 to build a harbor at Blacksod Bay, Ireland, and a railway connecting the harbor with the Irish railway system, and a contract had been placed for the carrying out of the work, which he anticipated would be finished in time to accommodate the large vessels which it was proposed to place on the Canadian route. He also stated that he and his associates were prepared to build the necessary vessels for such service both on the Atlantic and Pacific oceans, provided reasonable compensation for the carrying of mails, etc., was granted by the governments interested.

The Premier's reply stated that the question of increased facilities for transportation between Canada and Great Britain, and Canada, and Australasia, was one of the most important ones that the government had under consideration, and if the deputation had any further suggestions, or any modifications of former proposals to make, he would like them sent in at once, as the matter would have the earliest consideration on his return to Canada.

Commission on Sale of Steamships to Sir William Mackenzie.

Judgment was recently delivered in the English court of appeal, on the appeal of the Fairfield Shipbuilding and Engineering Co., Glasgow, against whom an order had been made for the payment, to W. Petersen, of £8,000, as commission on the sale of three steamships, now the Royal George and Royal Edward and another to Sir William Mackenzie, for £403,000. By a majority of the court, the appeal was allowed, and the judgment of the lower court reversed, it being held that there was no evidence of authority for the plaintiff to act on behalf of the company in the matter, and if any promise to pay commission was made by any of the company's directors, such a bargain was invalid, as the plaintiff was already acting for other proposed purchasers, with whom negotiations subsequently fell through, and he had not the assent of his principals to his bargaining for commission. On that ground therefore, he failed, and also failed on the ground that the purchase by Sir William Mackenzie was carried through independently of the plaintiff.

C. D. Sargent, M. Can. Soc. C.E., Resident Engineer, St. Lawrence canals, Cornwall, has been appointed Superintending Engineer, vice W. A. Stewart, Superintendent, resigned.

The British Maritime Trust Limited.

This company, which was originally established in 1888, to carry on the ordinary business of a trust and mortgage company, passed, in 1896, under the control of Furness, Withy and Co., and in 1897, the name of the British Maritime Mortgage Trust Ltd., was changed to the present one. The share capital is £1,000,000, in 200,000 shares of £5 each, of which 165,000 are issued and fully paid up. The balance of 35.000 shares was recently offered for subscription at a premium of 5s. a share, and an issue was also made of £500,000 5% first debentures of £100 each, at par, redeemable at 105.

The prospectus states that as the vast developments in Canada have led to a large demand for capital, the board has been directiong its attention for some time past to the Dominion as a promising field for extending the company's business. Through its associations with Furness, Withy and Co., it commands an excellent organization of long standing in touch with projected enterprises of every kind. The present issue is mainly to take advantage of desirable Canadian business already arranged for, and additional business for which negotiations are pending.

As a further aid in dealing with proposals from the Dominion, the directors have retained the services of a Canadian consulting adviser, C. G. Bryan, of Toronto, who has taken up his residence in London, Eng.

The directors have already conducted an important series of investigations and negotiations into a number of highly promising projects, the principal of which are, a substantial holding in the old established business of the Richelieu and Ontario Navigation Co., representing approximately 12,000 shares of $100 each, which were on July 4, quoted at $118, equal to $1,416,000, or about £292,500. This important concern was formed in 1846. The last balance sheet, as at Dec. 31, 1911, showed paid up capital of $5,311,875, and bonds outstanding to the amount of $1,233,633.33. The assets at the same date after deducting current liabilities were $7,260,697.44. It is paying quarterly dividends at the rate of 8% per annum. Besides owning a fleet of steamers, its property comprise offices, shipyards, workshops, warehouses, docks, sheds, wharves, pontoons. hotels, cottages, etc., covering about 150 acres in all, and situated at Montreal, Sorel, Three Rivers, Quebec, Murray Bay, Tadousac, Longueuil, etc. In this already large undertaking there has now been merged the Northern Navigation Co., with its fleet and valuable properties at Collingwood, Sault Ste. Marie, Point Edward and Gore Bay. There has also been taken over, the Inland Lines Ltd., with its steamers and related interests. The entire combination, which also amongst other recent acquisitions. includes the Niagara Navigation Co., possesses a fleet of some 70 steamers, by far the most extensive transport and passenger trade on the Great Lakes.

There have also been acquired or in course of negotiation, one half interest in the joint purchase with Furness Withy and Co., of the White Diamond Steamship Co., Liverpool, and an equal interest with them in the business of G. D. Warren and Co., of Liverpool, Eng., and Boston, Mass.; valuable freehold properties in Montreal, Toronto and Winnipeg; and an important harbor proposition in Vancouver, B.C., which should not only be a very valuable asset in connection with

List of Steam Vessels Registered in Canada during May and June, 1912

Name	No.	Where and When Built.	Engines, etc.	Length	Breadth	Depth	Gross Tons	Reg. Tons	Port of Registry	Owners
Adamantine	130,952	Hacketts Cove, N.S., 1912	Screw ½ n.b.p.	40.3	10.4	5.4	11	10	Lunenburg, N.S.	H. Levy, M.O., Hacketts Cove, N.S.
Adiramled	130,922	Cleveland, O., 1866. Detroit, Mich., 1882	" 30 "	198.0	27.4	10.6	630	364	Montreal	M. J. Morris, Montreal.
Alporto	130,314	Gravenhurst, Ont., 1912	" 8 "	85.1	13.9	5.9	101	79	Toronto	J. J. Beaumont et al, Muskoka, Ont.
Anoka	130,712	Kenora, Ont., 1912	" 3 "	65.5	16.2	6.0	61	41	Kenora, Ont.	Keewatin Lumber Co., Keewatin, Ont.
Ardeola	118,108	Dundee, Scotland, 1904	" 158 "	260.0	34.2	15.7	1414	765	Montreal	Ardeola Steamship Co., Liverpool.
Arranmore	131,027	Vancouver, B.C., 1912	" 2 "	36.7	10.2	4.9	14	9	Vancouver, B.C.	J. Emerson, Vancouver, B.C.
Bold Mary	131,024	Vancouver B.C., 1911	" 2 "	44.5	10.2	4.7	15	10	Vancouver, B.C.	W. H. Whalen, Vancouver, B.C.
Campaspe	130,859	Vancouver, B.C., 1912	" 1 "	33.8	8.0	3.9	9	6	Vancouver, B.C.	C. S. Kirk, Vancouver, B.C.
Carrie Helen	130,639	Reeds Point, N.B., 1912	" ⅛ "	46.2	18.7	1.9	19	14	St. John, N.B.	A. P. Pitt, Reeds Point, N.B.
Cirkvencia	130 907	Seattle, Wash., 1910	" 2 "	40.6	12.8	4.4	19	13	Vancouver, B.C.	P. Wallace, Vancouver, B.C.
Colleen	130,881	Seattle, Wash., 1909	" 11½ "	78.5	14.2	7.1	56	38	Victoria, B.C.	J. Arbuthnot, Victoria, B.C.
Christella	131,026	Vancouver, B.C., 1912	" 8 "	77.8	17.0	8.2	114	78	Vancouver, B.C.	Inland Transportation Co., Vancouver, B.C.
Deliab H.	130,948	Tancook, N.S., 1912	" 1 "	41.4	10.4	5.3	12	11	Lunenburg, N.S.	J. Hirtle, Tancook, N.S.
Dexter	130,910	Seattle, Wash., 1911	" 2 "	40.0	12.5	5.2	23	15	Vancouver, B.C.	P. Wallace, Vancouver, B.C.
Distributor	130,619	Kamloops, B.C., 1912	" 17 "	143.0	35.0	5.3	624	393	Victoria, B.C.	J. M. Mercer, Vancouver, B.C.
Douglas H.	130,237	Port Stanley, Ont., 1912	" 11 "	73.2	16.9	7.3	54	37	Port Stanley, Ont.	Lake Side Fish Co., Port Stanley, Ont.
Emma E.	130,839	Le Pas, Sask., 1909	" 2 "	41.0	10.0	4.0	19	13	Port Arthur, Ont.	H. Finger, Port Arthur, Ont.
Fredelia II.	130,911	Seattle, Wash., 1910	" 3 "	43.9	12.5	4.8	20	14	Vancouver, B.C.	P. Wallace, Vancouver, B.C.
G. R. Geary	130,313	Toronto, 1912	" 8½ "	62.7	17.0	8.0	199	135	Toronto	City of Toronto
Gladys Irena	130,945	Tancook, N.S., 1912	" 1 "	46.3	12.0	6.5	18	16	Lunenburg, N.S.	C. Harrle, Terence Bay, N.S.
Gladys Thorburn.	130,507	Shelburne, N.S., 1912	" 27 "	70.4	17.7	8.2	41	39	Shelburne, N.S.	J. H. Thorburn, M.O., Sand Point, N.S.
Glen Allen	130,645	Kingston, Ont., 1912	" 20 "	112.8	26.4	8.5	276	113	Ottawa	Ottawa Forwarding Co., Ottawa
Good Partner	130,912	Seattle, Wash., 1909	" 2 "	39.0	12.5	3.7	14	10	Vancouver, B.C.	P. Wallace, Vancouver, B.C.
Harfleur	125,753	West Hartlepool, Eng., 1909	" 391 "	385.0	51.1	26.4	4596	2847	Montreal	C. W. Harrison, London, Eng.
Harry S.	130,918	Seattle, Wash., 1897	" 8 "	4 1	14.0	5.7	20	14	Vancouver, B.C.	J. Wacters, Vancouver, B.C.
Hercules	130,648	Pembroke, Ont., 1911	" 3 "	50.0	16.0	4.3	30	19	Ottawa	Upper Ottawa Improvement Co., Ottawa.
Hurrah	130,950	Tancook, N.S., 1912	" 1 "	42.6	11.0	5.6	14	13	Lunenburg, N.S.	A. Stevens, M.O., Tancook, N.S.
Impala	130,860	Vancouver, B.C., 1912	" 2 "	47.7	11.0	5.7	25	17	Vancouver, B.C.	G. R. Macleod, Cobble Hill, B.C.
Ivy Leaf	130,913	Vancouver, B.C., 1912	" 4 "	56.0	14.0	4.5	25	17	Vancouver, B.C.	H. B. Irving & Co., Vancouver, B.C.
J. E. C.	130,646	Calumet Island Que., 1911	" 1 "	49.5	11.4	3.4	21	13	Ottawa	J. E. Cahill, Calumet Island, Que.
Kawatna	130,914	N. Vancouver, B.C., 1912	" 3 "	34.2	13.9	5.4	27	18	Vancouver, B.C.	Parkers' Steamship Co., Vancouver, B.C.
Keoonik	130,637	St. John, N.B., 1909	" 1 "	23.9	5.2	2.4	2	1	St. John, N.B.	J. H. Barber, St. John, N.B.
Kinmount	128,218	Dumbarton, Scotland, 1908	" 170 "	249.0	43.0	21.8	2112	1598	Montreal	Montreal Transportation Co., Montreal
Klatawa	130,915	N. Vancouver, B.C., 1912	" 6 "	63.9	14.4	6.5	43	29	Vancouver, B.C.	Packers' Steamship Co., Vancouver, B.C.
Lady Nymph	130,904	U.S	" 1 "	34.2	11.7	5.0	14	9	Vancouver, B.C.	J. Conedry, Vancouver, B.C.
Lanoraie	126,858	Sorel, Que., 1901	" 17½ "	78.5	18.2	7.4	90	31	Sorel, Que.	Marine & Fisheries Department
Laurel Leaf	130,916	Vancouver, B.C., 1912	" 4 "	56.0	14.0	4.6	25	17	Vancouver, B.C.	H. B. Irving & Co., Vancouver, B.C.
Loalinda	130,901	Vancouver, B.C., 1912	" 5 "	56.8	11.5	7.2	31	21	Vancouver, B.C.	T. T. Langlois, Vancouver, B.C.
M. T. Co., No. 3	130,907	Tacoma, Wash., 1908	" 3 "	46.4	12.6	4.0	15	10	Vancouver, B.C.	Metropole Transportation Co., Vancouver, B.C.
Mabelle	130,618	Boston, Mass., 1910	" 2½ "	70.2	15.2	6.2	54	31	Victoria, B.C.	J. A. Sayward, Victoria, B.C.
Madeline A.	130,624	Mahone Bay, N.S., 1912	" 15 "	64.0	18.2	7.0	39	26	Yarmouth, N.S.	P. Le Blanc, Wedgeport, N.S.
Mariel	130,772	Chicago, Ill., 1883	" 17 "	66.0	13.5	7.6	49	8	Sault Ste Marie, Ont	J. Ganley, Sault Ste Marie, Ont.
Marion L.	130,283	Buffalo, N.Y., 1912	" 2 "	50.2	11.5	5.3	19	13	St. Catharines, Ont	C. F Adams, Ridgeway, Ont.
Moosie	130,924	Montreal, 1912	" 2½ "	34.3	6.3	3.6	5	3	Montreal	J Garth, Montreal.
Nathalie R.	130,923	Sorel, Que., 1912	" 28 "	63.2	16.2	6.0	55		Montreal	Sincennes-McNaughton Line, Montreal.
Nimokish	130,905	N. Vancouver, B.C., 1912	" 3 "	54.2	13.5	5.4	27		Vancouver, B.C.	Packers Steamship Co., Vancouver, B.C.
No-Tow	130,955	Little Tancook, N.S., 1912	" 1 "	43.6	10.8	6.9	16		Lunenburg, N.S.	H. & P. Publicover, Blandford, N.S.
Olallie	130,908	N. Vancouver, B.C., 1912	" 16 "	72.5	16.9	7.4	80		Vancouver, B.C.	Packers Steamship Co., Vancouver, B.C.
Page	130,429	Deer Island, N.B., 1912	" 1 "	59.0	16.2	8.7	39		St. Andrews, N.B.	Connors Bros., Blacks Harbor, N.B.
Point Grey	130,917	N. Vancouver, B.C., 1912	" 63 "	93.4	22.3	14.5	238	1	Vancouver, B.C.	Public Works Department, Ottawa
Princess Sophia	130,620	Paisley, Scotland, 1911	" 182 "	245.2	44.1	24.0	2320	14	Victoria, B.C.	C.P.R Co., Montreal
Protective	131,025	Vancouver, B.C., 1912	" 19½ "	67.5	17.5	7.6	73		Vancouver, B.C.	Progressive Steamboat Co., Vancouver, B.C.
R. R. Foster	130,647	Ottawa, 1912	" 5 "	05.4	22.2	6.6	135		Ottawa	Rideau Canal Supply Co., Ottawa
Rakwana	130,951	Tancook, N.S., 1912	" 1 "	140.2	10.5	5.7	12		Lunenburg, N.S.	D. Smith, M.O., Cross Island, N.S.
Redonda	130,902	Vancouver, B.C., 1912	" 1 "	31.0	8.7	4.4	10		Vancouver, B.C.	G. T Seaton, Vancouver, B.C.
Ronald C.	130,946	Lunenburg, N.S., 1911	" 1 "	45.0	11.2	5.6	15	14	Lunenburg, N.S.	C. Tanner Blacks Rock, N.S.
Rosalind	115,274	Wallsend, Eng., 1890	" 319 "	300.4	41.1	21.6	2568	1634	Montreal	N.Y., N'fdland & H'fax S'ship Co., Liverpool, Eng.
Rowdy	130,925	Montreal, 1912	" 2 "	35.0	7.6	4.1	7	5	Montreal	A. S Forman, Montreal
S. B. Grabell	126,644	Port Dover, Ont., 1912	" 5 "	61.8	16.8	6.0	40	27	Port Dover, Ont.	H. W. Ansley & S. B. Grabell, Port Dover, Ont.
Samson	130,649	Portage du Fort, Que. 1911	" 3 "	50.0	16.0	4.2	29	18	Ottawa	Upper Ottawa Improvement Co., Ottawa
Stadium	130,623	Shelburne, N.S., 1912	" 28 "	78.6	20.6	9.0	118	49	Yarmouth, N.S.	New Burrell-Johnson Iron Co., Yarmouth, N.S.
Sterling M.	130,903	Vancouver, B.C., 1912	" 1 "	32.7	9.0	3.9	9	6	Vancouver, B.C.	A. & H. Main, Vancouver, B.C.
Sturgeon	130,588	Halifax, N.S., 1912	" 1 "	33.5	9.0	5.3	10	8	Halifax, N.S.	J. F. L. Rone, Halifax, N.S.
Swell	130,882	Vancouver, B.C., 1912	" 19 "	70.0	19.0	9.0	85	42	Victoria B.C.	G. McGregor, Victoria, B.C.
V. M. D.	130,906	Vancouver, B.C., 1912	" 2 "	40.0	9.4	4.4	15	10	Vancouver, B.C.	V. M Dafoe, Vancouver, B.C.
Vipond	130,587	Mahone Bay, N.S., 1912	" 4 "	58.4	15.1	6.8	26	18	Halifax, N.S.	Dominion Fisheries, Ltd., Halifax, N.S.
W. No 2	130,920	Seattle, Wash., 1912	" 3 "	53.0	15.0	5.2	35	24	Vancouver, B.C.	P. Wallace, Vancouver, B.C.
W. No. 3	131,021	Seattle, Wash., 1908	" 2 "	40.0	12.2	4.2	18	12	Vancouver, B.C.	P. Wallace, Vancouver, B.C.
W. No. 4	131,022	Seattle, Wash., 1912	" 3 "	44.0	13.0	5.2	22	15	Vancouver, B.C.	P. Wallace, Vancouver, B.C.
Wabis	130,644	Timiskaming, Que., 1911	" 3 "	66.0	23.1	5.0	77	38	Ottawa	Upper Ottawa Improvement Co., Ottawa
Wankon	130,971	Collingwood, Ont., 1912	" — "	65.2	11.5	5.0	31	25	Collingwood, Ont.	F. C Watts, Collingwood, Ont.
Wm. Armstrong	107,688	Ogdensburg, N.Y., 1876	" 90 "	105.0	31.0	9.4	318	225	Prescott, Ont.	Prescott & Ogdensburg Trans. Co., Prescott, Ont.

the shipping development of that port, consequent on the opening of the Panama Canal, but which, if acquired on the terms proposed, should represent a considerable increment of value as real estate.

Lord Furness is chairman of directors, who are all located in England. The Canadian department consists of J. R. Binning, Montreal, Manager; W. Molson Macpherson, President. Molsons Bank, Montreal, Consulting Adviser in Canada, and C. G. Bryan, Canadian Consulting Adviser, London, Eng.

Nautical Assessors for Marine Enquiries in British Columbia.

The Merchants Service Guild of British Columbia, which represents captains and officers in the province's coasting and freight shipping trade, has through its Secretary, H. G. Jarvis. brought under the Dominion Government's attention the question of the appointment of nautical assessors sitting upon courts of enquiry into shipping casualties occurring in B.C. waters. Following are extracts from the memorial:—

"The Guild feels that the composition of these courts has recently been of a very unsatisfactory nature, and that this should be remedied without further delay, because there is a strong liability that incompetent decisions may be given, resulting in grave injustices being inflicted upon captains and officers whose certificates and professional status are involved. The assessors sitting upon recent cases have mostly been persons whose practical knowledge of the waters in which the casualities occurred, has been insufficient to justify their appointment, and the Guild would therefore respectfully suggest that future assessors should be persons who are, by personal experience in command of local vessels, thoroughly conversant with the navigation of the particular place where the accident occurs. The Guild considers that if greater discretion were exercised in the appointment of these officials, along the lines suggested, the local profession would receive fairer treatment and a sounder judgment would be obtained."

Vessels Removed from the Register.

The following vessels were removed from the register, during May and June, for the reasons assigned:— Steam—D. A. Martin, Ottawa, 57 tons, dismantled; D. B. Mulligan, Ottawa, 46 tons, dismantled; Hercules, Ottawa, 13 tons, broken up; Iona, Picton, Ont., 157 tons, burnt; J. S. Blazier, Collingwood, Ont., 60 tons, sold to foreigners; Kennebecasis, St. John, N.B., 10 tons, broken up; Lilly May, Collingwood, Ont., 7 tons. dismantled. Lorna Doone, Collingwood, Ont., 18 tons, abandoned; Mildred, Ottawa, 13 tons, foundered; Mink, Toronto, 38 tons, dismantled; Minnie D., Collingwood, Ont., 2 tons, out of existence; Samson, Ottawa, 8 tons, broken up; Vergey, Hamilton, Ont., 14 tons, out of existence. Sailing—Aldine, St. Andrews, N.B., 299 tons, wrecked; Arkansas, Lunenburg. N.S., 98 tons, lost at sea; Bertie Calkins, Kingston, Ont., 227 tons. sold to foreigners; Calceolaria, Halifax, N.S., 30 tons, transferred to Newfoundland; Earl of Aberdeen, Parrsboro, N.S., 416 tons, transferred to Barbados; Hancock, St. John, N.B., 346 tons, transferred to Newfoundland; James A. Stetson, Pictou, N.S., 71 tons, wrecked; Kestrel, Shelburne, N.S., 99 tons, transferred to Newfoundland; Louise, Vancouver, B.C., 552 tons, wrecked and abandoned; Minnie F. Crosby, Halifax, N.S., 119 tons, sold to foreigners; Peerless, Yarmouth, N.S., 278 tons, transferred to Newfoundland; Uranus, Lunenburg, N.S., 90 tons, sunk; Warren W., Charlottetown, P.E.I., 79 tons, wrecked; Water Witch, St. Andrews, N.B., 12 tons, broken up; William A., Magdalen Islands, Que., 9 tons, out of existence.

Harbor Development on the Great Lakes.

The Minister of Public Works, who recently returned to Ottawa after an extended trip over the Great Lakes and a part of the St. Lawrence, stated that the appropriations of about $40,000,000 made this year, seem quite inadequate to meet pressing needs at important points, on account of the rapid expansion in every direction. In the course of his tour he met boards of trade, municipal councils and other public bodies, all of whom seemed conversant with the urgent needs of the various localities visited, as regards transportation, navigation, dock and wharfage facilities, and in no case did he consider that any extravagant requests had peen made. He considers that there is a lack of proper facilities at Canadian ports, and the navigation improvements in the Detroit river behind the times. In referring to Sault Ste. Marie, he stated that Canada requires another lock, but as that comes under the Department of Railways and Canals, which he understood had the matter under consideration, he could not deal with it, beyond stating that he believed the work to be necessary. In general, the Minister deplored the general unpreparedness of the ports on the Great Lakes to meet the legitimate exigencies of trade.

The Department of Public Works received tenders, Aug. 28, for the construction of a breakwater at Port Arthur, Ont.

A press dispatch from Ottawa states that the act providing for the granting of aid in the construction of dry docks, will be amended on the reassembling of Parliament, it having been found that companies desiring to build dry docks have been unable to finance such undertakings under the present conditions. It is said that the amendment will take the form of a larger guarantee, or the payments of the guarantee during the time the work is proceeding.

List of Sailing Vessels and Barges Registered in Canada during May and June, 1912

Name	No.	Where and When Built	Rig	Length	Breadth	Depth	Reg. Tons	Port of Registry	Owners
Abacena	130,947	Shelburne, N. S., 1912	Schr.	87.0	23.0	9.2	88	Lunenburg, N.S.	J. Sarby, M.O., LaHave, N.S.
Alexisna	130,985	Little Lameque, N.B., 1912	"	37.5	14.0	6.0	17	Chatham, N.B.	R. A. Noel, Little Lameque, N.B.
Alfarata	130,956	Mahone Bay, N.S., 1912	"	103.0	25.8	10.3	92	Lunenburg, N.S.	W. Ernst, Mahone Bay, N.S.
Amy B. Silver	130,942	Lastave, N.S., 1912	"	106.8	26.4	10.5	99	" "	K. Silver, M. D., LaHave, N.S.
Airator	130,988	Caraquet, N.B., 1912	"	37.0	14.3	6.0	17	Chatham, N.B.	P. S. Langleigne, Caraquet, N.B.
Bolina	130,657	Caraquet, N.B., 1912	"	38.0	14.5	6.5	20	" "	P. J. Fiott. Caraquet, N.B.
Cantow	130,953	Blandford, N.S, 1912	"	40.3	10.2	5.8	13	Lunenburg, N.S.	E. Publicover, Blandford, N.S.
Cento	130,944	Lahave, N.S., 1912	"	83.4	23.4	9.7	99	" "	N. Rafuse, M.O., LaHave, N.S.
Clara M.	100,484	Lunenburg, N.S., 1892	"	63.8	20.8	8.1	53	Sydney, N.S	J. D. McMillan Sydney, N.S.
Comet G.	130,954	Tancork, N.S., 1910	"	40.2	10.6	5.0	11	Lunenburg, N.S.	A. G. Allen, Indian Harbor, N.S.
Cormier	126,780	Aldouane, N.B., 1907	"	30.0	12.0	5.0	10	Chatham, N.B.	R. R. MacLean, Cbatham, N.B.
Dit On	130,982	Caraquet, N.B., 1912	"	35.0	13.0	4.7	12	" "	J. Poirier, Caraquet, N.B.
Dombrico No. 5	130,539	Lachine, Que., 1911	Scow	98.9	38.4	7.4	226	Montreal	Dominion Barging Co., Lachine, Que.
Dombrico No 6	130,540	Lachine, Que , 1911	"	98.9	38.4	7.4	226	"	" " " "
Drill Boat No. 5	130,771	S. Chicago, Ill., 1907	"	127.5	31.0	7.5	589	Sault Ste. Marie, Ont.	Soo Dredge & Construction Co., Sault St. Marie, Ont.
E. R. Bremner	130,643	Hull, Que., 1912	Scow	113.0	24.2	7.8	179	Ottawa	Ottawa Transportation Co., Ottawa
Emerencieune	130,986	Lameque, N.B., 1912	Schr.	37.6	13.5	6.0	17	Chatham, N.B.	T. Noel, Lameque, N.B.
F. Mary	126,935	Chateau Richer, Que., 1911	"	65.3	20.3	5.8	36	Quebec	A. Trepanier, Chateau Richer. Que.
Flora Matthews	130,781	Eastern Harbor, N.S., 1912	"	46.9	12.2	7.4	16	Pt. Hawkesbury, N.S.	A. Cormier. Point Cross, N.S.
Fulta	130,665	Richibucto, N.B., 1912	"	38.0	11.5	5.0	14	Richibucto, N.B.	G. H. Long, Richibucto, N.B.
Gaetta	130,247	Port Medway, N.S., 1919	"	40.0	11.7	6.1	16	Liverpool, N.S.	S. Parks, Port Medway, N.S.
Gilbert B.	130,356	Cape George, N.S., 1912	"	45.8	12.1	6.0	13	Arichat, N.S.	A. Bautbillier, M. O., Halifax, N.S.
H. C. M. No. 5	130,921	Toronto, 1910	Dredge	104.4	36 2	8.7	498	Montreal	Harbor Commissioners, Montreal
Hancock	130,636	Bucksport, Me., 1869	Bktn.	121.5	29.5	16.0	346	St. John, N.B.	E. B. Nickerson, West Port Clyde, N.S.
J. D. Hazen	130,943	LaHave, N.S., 1912	Schr.	104.8	26.2	10.2	99	Lunenburg, N.S.	D. Romkey, M. O., LaHave. N.S.
Karna II	130,782	Eastern Harbor, N.S., 1912	"	57.0	14.3	8.2	21	Pt. Hawkesbury, N.S	L. S Chasson, Eastern Harbor, N.S.
Katie Brainard	126,196	Marine City, Mich , 1871	Scow	168.0	29 5	8.8	398	Windsor, N.S.	G. Home and G. Y. Chown, Kingston, Ont.
L'Acadie	130,984	Lameque, N.B., 1912	Schr.	37.0	14.0	6.4	17	Cbatham, N.B.	L. Ache, Lameque, N.B.
L'Assomption	130,987	Lower Caraquet, N.B., 1912	"	41.8	14.5	6.0	18	" "	J. J. L. Chiasson, Lower Caraquet, N.B.
Lamecca	130,988	Lameque, N.B., 1912	"	39.0	13.6	6.4	19	" "	C. Ache, Lameque, N.B.
Lobelia	130,981	Carquet, N.B., 1912	"	42.0	14.0	6.5	21	" "	T. Gallien, Caraquet, N.B.
Louis P	130,625	Shelburne, N.S., 1912	"	74.0	19.6	8 3	60	Yarmouth, N.S.	L. P. D'Entremont, M. O., Pubnico, N.S.
M. and F. No. 10.	126,859	Sorel, Que., 1910	Dredge	132.5	42.1	9.5	702	Sorel, Que	Marine and Fisheries Department
Madonna V.	130,586	Essex, Mass., 1892	Schr.	91.2	23.8	9.2	77	Halifax, N.S.	L. R. Verge, M. O., Sober Island, N.S.
Marie H. LeBlanc	130,784	Margaree, N.S., 1912	"	52.0	14 1	9.5	21	Pt Hawkesbury, N.S.	G. LeBlanc, Margaree, N.S.
Mary and Mildred	130,941	LaHave, N.S., 1912	"	106.8	26.3	10.4	100	Lunenburg, N.S.	F. Conrad, M. D., LaHave, N.S.
Mildred Elaine	130,659	Lameque, N.B., 1912	"	41.0	13.8	6.3	20	Cbatham, N.B.	G. D. LeRiche, Lameque, N.B.
New Brunsw'k No.2	130,639	St. John, N.B., 1889	Dredge	61.2	19.3	5.4	56	St. John, N.B.	New Brunswick Construction Co., Westford, N.S.
P. S. Co. XX	130,919	N. Vancouver, B.C., 1912	Scow	64.0	23.6	3.0	79	Vancouver, B.C.	Packers Steamship Co., Vancouver, B.C.
Pepperell	130,246	Liverpool, N.S., 1911	Dredge	60.4	30.0	5.8	152	Liverpool, N.S.	Atlantic Dredging Co., Louisburg, N.S.
St.Sauveur	130,660	Lameque, N.B., 1912	Schr.	37.5	14.0	6.5	18	Cbatham, N.B.	I. Chiasson, Lameque, N.B.
Titus McLeod	130,949	Lunenburg, N.S., 1906	"	39.8	11.2	5.2	11	Lunenburg, N.S.	J Berringer, West Dover, N.S.
Typhon	85,410	House Harbor, Que , 1912	"	69.3	19 8	7.4	58	Magdalen Islands, Que	A. Arseneau, M. O., House Harbor, Que.
Winona	130,023	U. S.	Sloop	27.0	8.5	2.8	5	Vancouver, B. C.	S. Burke, Vancouver, B.C.
Zambuck	130,783	Plateau, N.S., 1912	Schr.	47.5	13.1	7.2	17	Pt. Hawkesbury, N.S.	S. P. Lefoot, Plateau, N.S.

The Construction of the Port Arthur Dry Dock.

Canadian Railway and Marine World for March contained a description by A. V. Powell, M. Am. Soc. C.E., of the dry dock which has been built at Port Arthur, Ont. Following are particulars as to the construction methods, plant, etc.

The dock is constructed of concrete and steel and rests upon a foundation of solid rock. A large amount of excavation was necessary, 90,000 cubic yards of earth and rock being removed. A 70-ton Marion shovel, with a 2½ yd. dipper fitted with Panama teeth was used. Digging began at the shore end in April, 1910, and trains and dump cars hauled by locomotives transported the excavated material to form an earth fill on either side, making new ground beyond the original shore line. To cut off

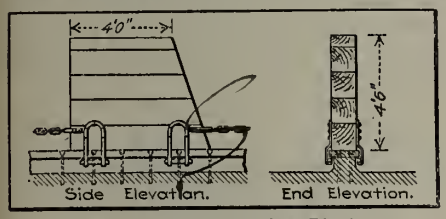


Fig. 1. Detail of Bilge Block.

the water during construction a cofferdam 900 ft. long was built in the shape of a horseshoe surrounding the site on three sides, as shown in fig. 2.

Two pile drivers, working in opposite directions from the portal end, drove round piles in two parallel rows, 900 ft. long, forming an enclosure around the entrance end 300 ft. wide. These piles, spaced 3 ft. centres, formed an outer and inner fence for the 6 by 10 in. and 2 by 10 in. sheet piling which was afterwards driven to rock. Waling strips 8 by 12 ins. were used for the sheet piling and round pile wales were used for the outside. Steel tie rods were placed across the cofferdam every 3 ft. On top of the round piling and sheet piling a framing was constructed of 8 by 12 in. timbers on which a temporary track was laid. As fast as the sheet piling was driven, earth filling was carried out by means of trains of dump cars operated by small locomotives. The resulting cofferdam was a very stable structure. To pump out and keep dry the dock excavation, and the enclosure formed by the cofferdam, three pumps were installed. The cofferdam completed, excavation was carried to rock throughout, enough shale and igneous rock being removed to level the basin. Six Canadian Rand drills and a 5 in. well boring machine comprised the drilling outfit.

The speed with which the concrete work was done was due to the organization of the working forces and the efficient arrangement of the plant. Placing concrete was so simplified that from the dredging to the final pouring the work was continuous. The arrangement of the construction plant is shown in fig. 2. Scows of 1,000 yards capacity, fitted with derricks and clam shell buckets, dredged sand and gravel from Lake Superior, at 60 miles from the site, and unloaded it at the portal face upon the cofferdam on either side of a travelling whirley; two hoppers placed over a 24-in. conveyor belt, electrically driven, received the materials from the whirley and alternately fed the belt which led to the mixer tower. Here were two receiving hoppers for sand and gravel, and below were two charging hoppers. The latter received the proper quantities of sand, gravel and cement for separate batches of concrete, and the whole charge was run into one of the two mixers below. A new charge was immediately prepared and this in turn was run into the second mixer. In this way it was possible to have the plant working to its full capacity without intermission. The concrete, after being mixed, was elevated by a bucket hoist, to V-shaped steel dump cars, of one yard capacity, on a truck running along the top of the forms for the dock wall. From the cars the concrete was poured directly into the forms. The tracks were laid in a number of loops crossing the dock excavation on trestles, so that there was no confusion in returning empty cars to the mixers. (Fig. 2.) By this system as much as 1,000 yards of concrete was placed by two shifts in one 24-hour day.

The forms for the side walls were made in small sections, for convenience in handling. Each section was 5 ft. wide and extended the full height of the wall. Seven of these were placed together and bulkheads were attached at each end. In this way a section of the wall 36 ft. long could be poured, making a huge monolithic block. Alternate 36 ft. lengths were first built, and when the concrete had finally set the intermediate sections were poured. An expansion joint was formed for every 36 ft. of length, and so cracking was obviated.

The dock proper is 85 ft. 4 ins. wide at the floor level and 98 ft. 8 ins. at the top of the walls. It is 700 ft. long, and a further length of 28½ ft. within the portal or entrance may be utilized. Spaced every 18 ft. in the side walls are three altar steps designed to hold lateral bracing to support vessels in the dock.

The floor is solid concrete from 2 to 4 ft. thick, sloping towards a central drain which terminates in a rudder well at the portal end. From the rudder well a drain protected by an iron grating gives access to the pumping well situated in the west portal pier. With a view to future extension this drain was duplicated on the opposite side of the pumping well so that when a second dry dock is built parallel to the present basin, the pumping outfit will serve for both docks.

The portal walls are solid masses of concrete, faced with concrete of a 1-3-5 mixture, which is used also in the side walls. The outside corners are curved and are protected from injury by steel plates firmly attached by means of steel angle anchors embedded in the concrete. The portal jambs and sills are faced with steel. Angles 6 by 6 by ¾ ins., firmly fastened to the concrete floor by 3 by 3 by ½-in. angles, 4 ft. long, spaced 2 ft. apart, form a connection for the 16 by ¾ in. plate against which the heavy steel gate and caisson rests. Strong lateral anchors embedded in the portal piers hold the jambs in position. Great care was exercised in placing this steel framework to obtain a truly vertical and longitudinal alignment.

A feature of interest is the construction and arrangement of the bilge and keel blocks with their attachments. The slides upon which the bilge blocks move are spaced 12 ft. apart on each side of the dock, and are made of 3 by 14 in. white oak timbers bolted every 2 ft. Split anchor bolts, ¾ by 18 ins., fasten them securely to a concrete base and the nuts are countersunk, leaving a smooth upper surface on which the bilge blocks slide. These blocks are 4½ ft. in height, made of 12 by 12 in. Oregon fir timbers. They are drift bolted together at the ends and are furnished with slide irons and wooden slide blocks clamping them to the slides.

Two hauling chains are attached to each block by means of U bolts, and two fair leaders are attached to the dock wall, one at the lower angle and the other near the top. The keel blocks, constructed of 12 by 12 in. white oak timbers, fastened together with 1 by 20 lag screws, rest on a 12 by 14 in. white oak timber set in the concrete floor and fastened thereto with 24 in. expansion bolts. These are spaced 6 ft. apart and extend from the rudder well to within 12 ft. of the shore end of the dock.

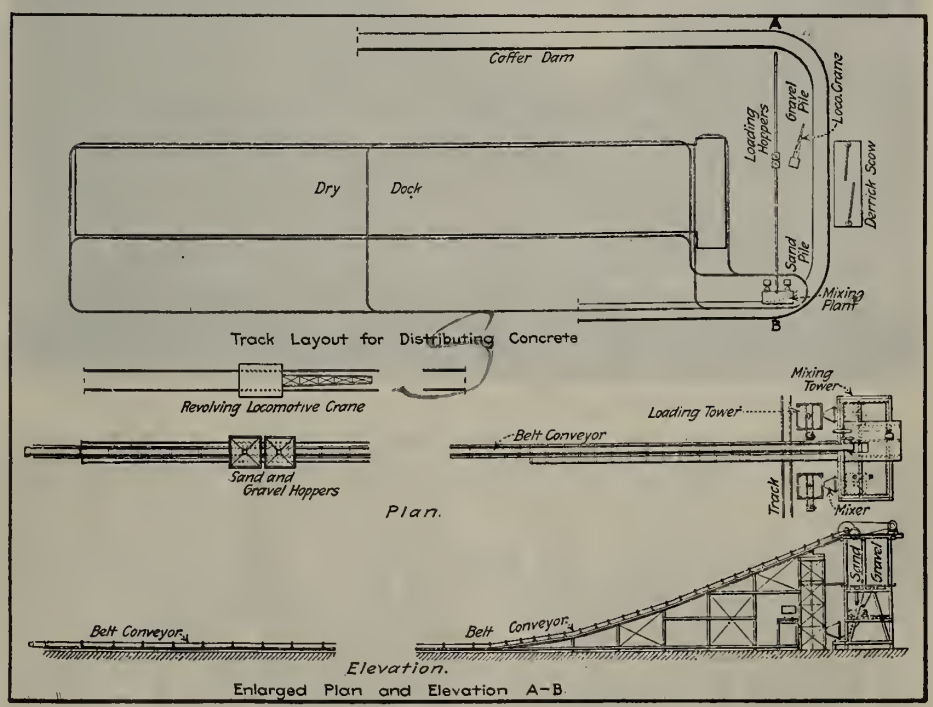


Fig. 2. Arrangement of Construction Plant for Mixing and Handling Concrete.

Concrete sidewalks 5 ft. wide run the full length at each side, and four reinforced concrete stairways lead from their ends to the top of the dock walls. The dock was begun April, 1910, and completed by the end of November of the same year. The work was carried out under the direction of W. R. Sinks, Manager, and R. H. Folwell, Engineer for the contractors, Canadian Stewart Co., Ltd.

The Floating Dry Dock for Montreal.

The dry dock, which has been built at Barrow, Eng., for the Canadian Shipbuilding and Engineering Works, to be located at Maisonneuve, Montreal, the launching of which was mentioned in our last issue, is 600 ft. long by 135 ft. wide over all. The depth of the pontoons at the bottom is 17 ft., the side walls rising to a height of 42 ft. from the pontoon deck, so that the over all depth is 59 ft. Vessels of 100 ft. beam will be easily docked, and as the ends are opened, vessels of any length can be accommodated. There are bridges at both ends for the conveyance of the workers. This type of dock was chosen in preference to a masonry or concrete construction, because although normally it will be utilized within the basin which has been prepared for it at Montreal, it will be possible to tow it to any point on the Atlantic coast to assist in the raising of any vessel which may get damaged by running aground, etc. A feature in the design was the aim to economize in the working of the dock, thus, although it will be capable of taking the heaviest vessels, it will be more frequently used for vessels of moderate size, and on such occasions it will not be necessary to use the whole of the dock, nor to run the machinery at its full power. In structural details everything has been done to make the dock continuously reliable. Steam heating is provided, to prevent the water in the compartment freezing. All the machinery in the dock is being supplied in duplicate, and the equipment includes every conceivable appliance to facilitate the docking of a vessel.

The Montreal Floating Dry-Dock, under construction, April 2, 1912.

The completed works will occupy about 30 acres with a water frontage of 2,500 ft. and when fully working will give employment to about 2,000 men. The buildings generally will be of steel frame construction and brick, and the vessel construction berths will be so arranged that vessels up to 1,000 ft. long can be built.

After the launching ceremony, Sir A. T. Dawson, one of the directors of Canadian Vickers, Ltd., stated that in the near future the company intended to have in Canada an organization approximating generally to that existing at the Barrow works, for the building and equipping of vessels of all types. The dock should arrive in Montreal in the early part of September.

British Columbia Quarantine Regulations.

The Marine Department has issued the following information regarding quarantine regulations for vessels trading to B.C. ports:—

The quarantine station for the ports of Victoria and Vancouver, Vancouver Island and the lower mainland of British Columbia, is at Parry Bay, on the southeast coast of the island, and all vessels bound for the foregoing and other ports in that district must call at that station for inspection and permission to proceed to port of destination. Vessels from ports on the U.S. Pacific coast, including Alaska, are exempt from the usual quarantine inspection, but in the event of epidemic disease prevailing at the port of departure, the exemption will be withdrawn, and the vessels must then call at the quarantine station. Should any case of infectious disease, or suspicion of such, develop during the voyage, a vessel must proceed without delay to the quarantine station. An inspecting officer is stationed at Port Alberni, who will clear any vessel which has a clean bill of health. In case of illness requiring fumigation, vessels may be ordered to the quarantine station at William Head. As there is a medical officer stationed at Prince Rupert, vessels can proceed direct to this port from foreign ports if they have a clean bill of health, but should a case of infectious disease, or suspicion of such, develop on the voyage, the vessel must proceed to the quarantine station at William Head before calling at any other port. The establishment of a quarantine at Prince Rupert is under consideration and on its establishment, vessels may proceed to Prince Rupert direct from any other port.

The British s.s. Wilhelmina, which recently ran on the rocks at Peters River, Nfld., and was considered a total loss, has been refloated. An examination is being made as to the damage sustained.

During June, five employes were killed, and one was injured, in the course of their work in connection with the navigation of Canadian waters. The deaths were all due to drowning, three being caused by falls overboard, one by falling from a wharf, and one as the result of a collision.

Telegraph and Cable Matters.

C. F. MacGowan has been appointed agent, Great North Western Telegraph Co., Belleville, Ont., vice P. F. Canniff, resigned.

A. B. Smith, Manager of Telegraphs, G.T. Pacific Ry., was in Prince Rupert, recently, arranging for the handling of telegraph supplies for the line erection as soon as the Skeena River bridge is completed.

The C.P.R. Telegraph Department has opened offices at Mount Stephen House, Field, B.C.; Bethany, Bethany Jct., Brechin, Eldon, Grass Hill, McAlpin, Petewawa camp, Orillia, Point au Baril and Uhtoff, Ont.; Expanse, Khedive and Milden, Sask.

The C.P.R. has arranged a new schedule of wages for its commercial telegraph operators, by which an increase of $5 a month is granted to all operators, with two weeks holiday with pay, after four years' service. In addition to some slight changes in rating, a number of employes will receive increases amounting to $10 a month.

The Michigan Central Rd. telegraph employes in Canada have been granted increases in pay amounting in some cases to $10 a month, and men operating telephones for train dispatching purposes are to be classed and paid as telegraphers. In connection with the employes' demands for increased pay, etc., a concillation board was appointed some time ago, but the agreement outlined has been reached without the board's aid.

J. T. Phelan, Superintendent of Government Telegraphs, who returned to Vancouver, Aug. 15, from a trip of inspection of the telegraph lines in the north, stated that on account of the amount of business being handled by the lines there, further extensions, no doubt, will be made. The line from Bella Coola to the coast to connect with 150 mile house on the Caribou main line is about half finished, and the remainder, about 140 miles, will be ready for operation before the winter.

The C.P.R. has installed automatic instruments for its telegraph service between Montreal and Toronto, and if it proves successful, it is stated that the system will be extended. The instrument is known as the Morkrum system, and it is described as an automatic printer based on the selector system, the transmitter operating a keyboard similar to that of a typewriter at one end of the wire, the printing arrangement being at the other end, into which perforated rolls of blanks are automatically fed.

The Great North Western Telegraph Co. has opened offices at Eganville station, Ont., and Pierreville station, Que.; has re-opened its offices at Ameliasburg, Clifton House, Niagara Falls, Crystal Beach, Grimsby Beach, Petewawa camp, Royal Muskoka Hotel, Wheatley, Ont.: Abenakis Springs Hotel, Les Eboulements wharf, Manoir Richelieu Pointe au Pic and Pointe a Pic, Que.; Beaumaris, Maplehurst, Port Colborne and Rousseau, Ont.; and has closed its offices at Eganville, Morton, Florence and Lions Head, Ont., and St. Roch de Richelieu station, Que.

B. S. Jenkins, General Superintendent, C.P.R. Telegraphs, Western Lines, who was in Vancouver, Aug. 17, is reported to have stated that construction had been commenced on the erection of an additional through copper wire from Port Arthur, Ont., to Vancouver, an additional circuit from Vancouver to Revelstoke, an additional circuit from Moose Jaw to Winnipeg, an addition copper wire from Moose Jaw to Outlook, Sask., connecting with the wires to Calgary, thus giving another through alternative route from Winnipeg to Revelstoke. These extensions are additional to those authorized early in the year.

Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time, we wish our readers to distinctly understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

The B. Greening Wire Co., Hamilton, Ont., has issued an illustrated catalogue of wire rope and fittings giving most complete information about the various lines they manufacture.

The American Vanadium Co., Pittsburgh, Pa., has issued "Vanadium Steels," an 80 page booklet, giving complete and up to date illustrated information on experience with vanadium steel, the various types, compositions, heat treatments and tables of tests, all of which is of considerable value to engineers and others interested in steel and iron products.

The Dominion Bridge Co., Ltd., has been incorporated under the Dominion Companies Act, with a capital of $10,000,000 and offices at Lachine, Que., to carry on a bridge building business, and in connection therewith to build railway sidings and tramways, to own rolling stock, to own and operate steam tugs, barges, etc., and to carry on various incidental businesses.

The output of Titanium steel for 1911, according to statistics compiled by the American Iron and Steel Association, was 402,808 gross tons, comprising 252,540 tons of Titanium open hearth and crucible steel and 150,546 tons of Titanium Bessemer steel. This was a considerable increase over the output of 1910, and shows a remarkable gain for Titanium steel; in as much of the production of steel castings decreased 31.2 per cent. from the output of the previous year.

The Canadian Fairbanks-Morse Co., Ltd., has been granted supplementary letters patent increasing its capital stock to $3,100,000, and has arranged for the issue of $1,000,000 preferred stock, of which $400,000 will go into plant enlargement. It has been decided to increase the manufacturing facilities at Toronto by the erection of a shop 350 ft. by 100 ft., to be used partly as a forge for making tractor trucks, and the remainder of the shop for mounting the engines on them.

The Canadian Fairbanks-Morse Co., Ltd., has secured the Canadian agency for the Orenstein-Arthur Koppel Co. of New York, consulting engineers and manufacturers of portable railways, industrial railways, narrow gauge sidings, narrow gauge public railways, and railway equipment of all descriptions, their works being located at Koppel, Pa. Their catalogue 400, which covers their lines very comprehensively, can be obtained from the Canadian Fairbanks-Morse Co., Ltd., Montreal.

M. Beatty & Sons, Ltd., manufacturers of dredges, ditchers, derricks, steam shovels, etc., Welland, Ont., have recently undergone a change of management, owing to the desire of the senior members of the Beatty family to take a less active part than heretofore. The Browning Engineering Co., of Cleveland, Ohio, has acquired control, and it is said that the plant will be considerably enlarged. R. A. Greene, heretofore Chief Engineer, Browning Engineering Co., has been appointed General Manager. A. O. Beatty, heretofore Engineer and Manager, will act in an advisory capacity as Consulting Engineer. F. H. Owen, heretofore Secretary-Treasurer, has been appointed Treasurer. G. Day, heretofore Assistant Sales Manager, Browning Engineering Co., has been appointed Secretary and Sales Manager. R. M. Beatty continues as Superintendent of Works, and E. R. Beatty continues as Purchasing Agent.

C. H. Besly and Co., Chicago, Ill., have placed on the market a combination disc grinder and drum sander for wood pattern making. The disc wheel is of steel, 30 ins. diar., and runs at 750 r.p.m., and the working table may be tilted and locked at any angle from 75 to 135 degrees. It has also a vertical adjustment of 25 ins. The equipment includes four work table attachments, the sizing circle gauge for cylindrical and conical grinding, the sliding bevel gauge for simple and compound angle grinding, the sizing bevel gauge for simple and compound angle grinding to dimensions, and the angle plate for freehand cornering of thin work. The drum sanding arrangement has a work table 24 by 28 ins., which may be tilted and locked to any angle from 85 to 105 degrees from the axis of the sand drum. It runs at 2250 r.p.m., and has a perpendicular reciprocating motion while running. The machine is driven by a 3 h.p. motor, through sprockets and link belt attachment is chain, and the sanding attachment is driven by a self oiling friction clutch, which enables the operator to stop the sander regardless of the disc wheel. The machine is made with 30 or 40 in. diar. disc wheels, either belt or motor driven, and occupies a floor space of 54 by 84 ins.

British Columbia's Public Works Department is spending $8,500,000 for roads, bridges and other improvements. Some of the new roads are located 1,200 to 1,500 miles north of Vancouver. J. E. Griffith, known in the west as the man who walked from Winnipeg to Vancouver while making C.P.R. location surveys, in the 80's, is chief engineer.

P. R. Gransaull, in writing us from St. Joseph, Trinidad, B.W.I., remitting renewal of subscription, says:—"I cannot close my letter without telling you of my appreciation of the Canadian Railway and Marine World. I look forward to getting it every month, and to me it is almost like receiving a personal letter."

TENDERS

TENDERS, addressed to the undersigned at Ottawa, and endorsed on the envelope, "Tender for Customs Steamer," will be received up to noon of the

Second Day of September. 1912.

for the construction of a Twin-screw Steel Steamer for Customs Service on the Atlantic Coast, to be delivered at the port of Quebec, of the following leading dimensions, namely: Length, between perpendiculars, 185 feet; breadth, 32 feet; draught, 10 feet 6 inches, and speed, 15 knots per hour.

Plans and specifications of this steamer can be seen at the Department of Customs, Ottawa, and at the offices of the Collectors of Customs, Toronto, Collingwood, Montreal, Quebec, St. John, N.B., and Halifax, N.S.

Plans and specifications can be procured upon application to the Commissioner, Department of Customs, Ottawa.

Each tender must be accompanied by an accepted bank cheque in favor of the Commissioner of Customs, equal to ten per cent. of the whole amount of the tender, which cheque will be forfeited if the successful tenderer declines to enter into a contract with the Department, or fails to complete the steamer.

Cheques accompanying unsuccessful tenders will be returned.

The Department does not bind itself to accept the lowest or any tender.

Newspapers copying this advertisement without authority from the Department will not be paid.

JOHN MCDOUGALD,
Commissioner of Customs.

Department of Customs,
Ottawa, 19 July, 1912. —26162

Department of Railways and Canals, Canada

HUDSON BAY RAILWAY.

NOTICE TO CONTRACTORS.

Sealed Tenders, addressed to the undersigned and endorsed "Tender for construction of The Hudson Bay Railway," will be received at this office until 16 o'clock, Thursday the 12th of September, 1912, for the section from Split Lake Junction to the Hudson Bay terminus.

Plans and profiles showing the character and extent of the work to be done, the specifications and form of contract to be entered into and other information can be seen on and after Thursday the 15th of August at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, and at the office of the Chief Engineer of the Hudson Bay Railway, Winnipeg, at which places forms of tender may be obtained.

Separate tenders will be required covering the work enumerated in the schedule on the section from Split Lake Junction to Port Nelson, a distance of approximately 165 miles and on the section from Split Lake Junction to Port Churchill, a distance of approximately 245 miles.

The successful tenderer will be required to sign a contract covering the work from Split Lake Junction to the terminus selected and which will be announced by the Hon. Minister of Railways and Canals on his return from Hudson Bay.

Parties tendering will be required to accept the fair wages schedule prepared or to be prepared by the Department of Labor, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered, unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $150,000.00, made payable to the order of the Minister of Railways and Canals, must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work, at the rates stated in the offer submitted.

The cheque thus sent in will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security, for the due fulfilment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,

L. K. JONES,
Asst. Deputy Minister and Secretary.

Department of Railways and Canals,
Ottawa, August 14, 1912.

Newspapers inserting this advertisement without authority from the Department will not be paid for it.—271.24.

Canadian Pacific Railway Company.

Issue of $18,000,000 Ordinary Capital Stock.

SPECIAL INTEREST PAYMENT.

As intimated in the President's circular to the Shareholders, dated January 3rd, 1912, an interest payment at 7% or $3.18 per share, will be paid on October 15th next, on the first four instalments ($120) from the due date of each instalment to September 30th, 1912, on the shares of the above new issue represented by the certificates of subscription, to holders of record at close of business, August 16th next, who have paid these instalments on or before their respective due dates. Notice is hereby given that this interest payment will be mailed from New York to the registered addresses of holders or their duly appointed attorneys, on October 14th, 1912. For the purpose of this payment the certificate of subscription books will close August 16th at 3 p.m., and reopen September 16th, 1912.

W. R. BAKER.
Secretary.

Montreal, July 31st, 1912.

CANADIAN PACIFIC RAILWAY COMPANY.

Notice to Shareholders.

The Thirty-first Annual General Meeting of the Shareholders of this Company, for the election of Directors to take the places of the retiring Directors, and for the transaction of business generally, will be held on Wednesday, the second day of October, next, at the principal office of the Company, at Montreal, at Twelve o'clock, noon.

SPECIAL MEETING.

The Meeting will be made Special for the purpose of authorizing the issue of Consolidated Debenture Stock of the Company to acquire the outstanding securities of the Dominion Atlantic Railway Company and also for the purpose of considering, and, if approved, of authorizing an increase of the present authorized Ordinary Capital Stock of the Company by an amount not exceeding $60,000,000 for the purposes of the Company, such increase of Stock to be issued according to the requirements of the Company and as may be determined by the Directors, and of adopting such Resolution or By-law as may be deemed necessary in connection therewith in order to enable the Directors to give effect thereto.

The Common Stock Transfer Books will be closed in Montreal, New York and London at 1 p.m., on Saturday, the thirty-first day of August. The Preference Stock Books will be closed in London at the same time.

All books will be re-opened on Thursday, the third day of October.

By order of the Board,

W. R. BAKER,
Secretary.

Montreal, August 12th, 1912.

THE CANADIAN PACIFIC RAILWAY COMPANY.

Dividend Notice.

At a meeting of the Board of Directors held this day, the following dividends were declared:—

On the Preference Stock, two per cent. for the half year ended 30th June last.

On the Common Stock, two and one-half per cent. for the quarter ended 30th June last, being at the rate of seven per cent. per annum from revenue and three per cent. per annum from interest on the proceeds of land sales and from other extraneous assets.

Both dividends will be paid on 1st October to Shareholders of record at the closing of the books in Montreal, New York, and London, at 1.00 p.m., on Saturday, 31st August next.

All books will be re-opened on Thursday, 3rd October next.

By order of the Board,

W. R. BAKER,
Secretary.

Montreal, 12th August, 1912.

Ontario Jockey Club

Toronto

Autumn Meeting

September 21 to 28

Racing

Steeplechasing

General Admission, $1.50

JOS. E. SEAGRAM, President. W. P. FRASER, Sec'y-Treas.

WOOD'S

Flexible Nipple End Hose Protector

For Air Brake and Signal Hose. Prevents chafing and abrasion. Guaranteeing a saving of from 40 to 50% in cost of maintenance of

Air Brake Hose.

THE MONOGRAM

Train Pipe Bracket will absolutely stop shifting and leaking of Air Brake Train Pipes.

Correspondence Solicited.

GUILFORD S. WOOD
Railway Necessities
CHICAGO

J-M ASBESTOS & MAGNESIA RAILROAD SUPPLIES

Roofings	Locomotive Lagging	Pipe Coverings	Electrical Supplies
Shingles	Air Brake Cylinder	Smoke Jacks	Overhead Line Material
Packings	Packing Expander Ring	Asbestos Wood	Rail Bonds and Tools
Gaskets	Underground Conduit	Fibre Conduit	"Noark" Fuse Devices
Hair Felt	Leak-No-Metallic Compound	Insulation	Fuse, Service and Subway Boxes,
Cements	Fire Extinguishers	Metal Polish	etc., etc.

Write Nearest Branch for Catalog No. 252.

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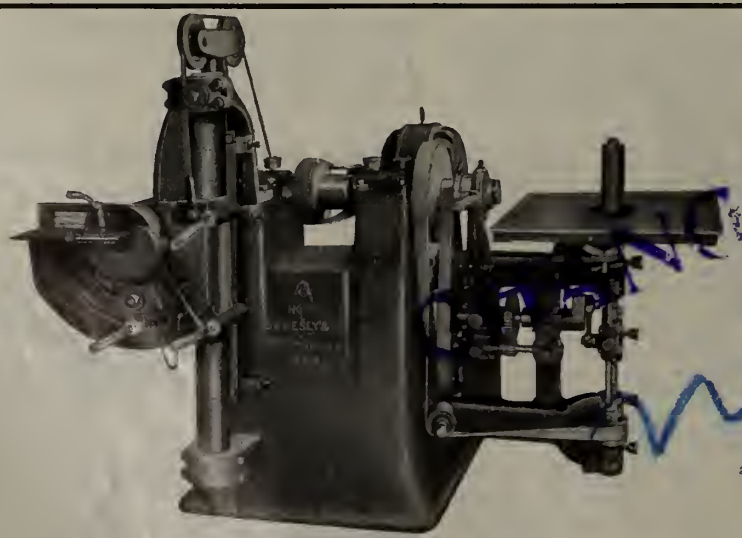
Toronto, Ont. London, Ont. Montreal, Que. Winnipeg, Man. Vancouver, B.C.

The Parry Sound Lumber Co
Limited,
1315 Traders Bank Bldg., Toronto
Manufacturers of
PINE, HEMLOCK, LUMBER, BRIDGE TIMBER, RAILWAY TIES, TELEGRAPH POLES, LATH, SHINGLES, BOX SHOOKS.



No. 15-30-C Besly Patternmaker's Grinder.

MEET US AT BUFFALO
AT THE CONVENTIONS & EXHIBITS OF FOUNDRY AND MACHINE SHOP EQUIPMENT AND SUPPLIES.
SEPTEMBER 23-27, 1912

A Wonderful Labor Saver in the Pattern Shop.

See this machine running at space 151, 170 and 171, Foundrymen's Convention at Buffalo.

WRITE FOR ILLUSTRATED FOLDER.

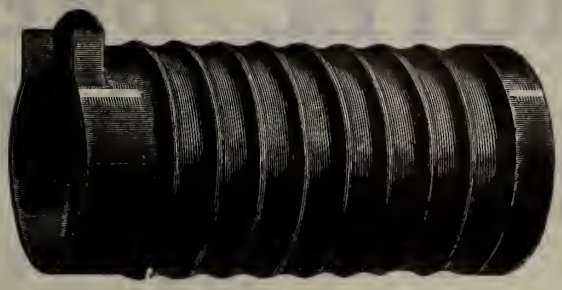
BESLY CHICAGO

CHARLES H. BESLY & CO., : CHICAGO, U.S.A.

MORISON Suspension Furnaces

The Universally satisfactory record of "THE MORISON" proclaims it the best furnace made.

With Plain Ends or Flanged to any required shape.



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Uniform Thickness, Easily Cleaned, Unexcelled for Strength, Unsurpassed for Steaming Capacity.

Manufactured by

THE CONTINENTAL IRON WORKS

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Near 10th and 23rd St. Ferries

Canadian Sales Representatives: THOS. ROBERTSON & CO. LTD., 134 Craig St., Montreal.

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The M. C. B. rules of interchange provide for the use of THE STEEL BACK BRAKE SHOE on your freight equipment.

The use of OUR STEEL BACK SHOE will mean a saving in brake shoe maintenance, brake heads and brake beams.

THE STEEL BACK BRAKE SHOE is an economy on all railway equipment.

LET US PROVE IT TO YOU

American Brake Shoe and Foundry Company

NEW YORK MAHWAH, N.J. CHICAGO, ILL.

THE HOLDEN CO., Limited, Agents, 354 St. James St., MONTREAL

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Efficient and economical operation is a consideration which leads to the adaptation of the "Bliss System."

"National" Storage Batteries for Car Lighting or Railway Signal Service give the best service at the lowest cost.

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NEW HOTEL BREVOORT CHICAGO

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Centrally located. Near-by cars of all Stations. All rooms are outside rooms. Baths Connecting. Restaurant. Grill Room. Unsurpassed in Appointments and Decorations. Table Unexcelled. Prices Moderate.

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ARTHUR M. GRANT, MANAGER

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ELECTRICAL ENGINEERS, ETC.

MANUFACTURERS OF

Complete Switchboards

D.C. up to 2,000 Volts.—A.C. to 60,000 Volts

Transformers, Switches, Circuit Breakers

ELECTRIC RAILWAY AND BATTERY BOARDS A SPECIALITY

House Service Type and Traction Meters

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G. C. ROYCE, West Toronto, Ont.

Let us quote you on your requirements.

Brown Bayley's Low Carbon Sheffield Spring Steel

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The Light of Day on The Right of Way

TRADE COMMERCIAL STORED SUNLIGHT ACETYLENE MARK

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"Locomotives equipped with your type acetylene headlight have been in service quite a period, affording excellent light and cost of maintenance most satisfactory."

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Standard Tank Supplies Several Weeks Lighting

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Small Tank Supplies 112 Days Continuous Burning

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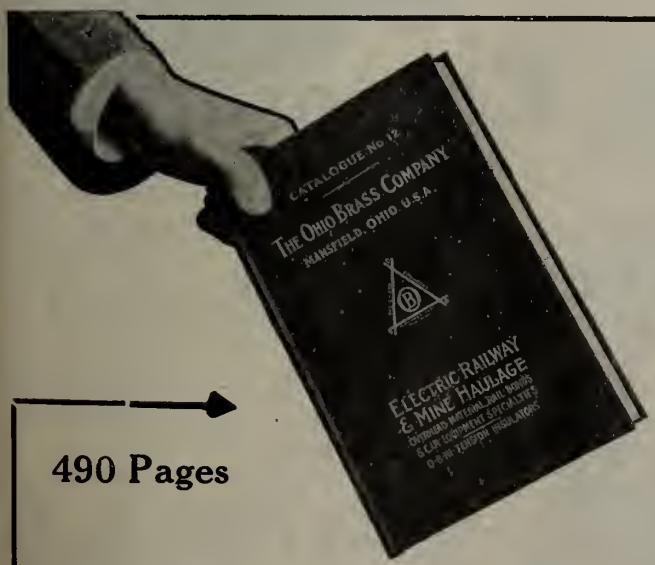
Send for Circular of our New Combination Pressure and Vapor Car Heating System

Largest Manufacturers in the World of Car Heating Apparatus



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Construction Data

given on many pages of our

New General Catalog, No. 12

CHANGE

in addition to a complete listing of Railway Overhead Materials, Rail Bonds, Car Equipment Specialties and O-B Hi-Tension Porcelain Insulators.

Sent on request—duty and express prepaid.

Please mention this advertisement.

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THE ALGOMA STEEL CO., LIMITED

SAULT STE. MARIE, ONTARIO

IS NOW BOOKING ORDERS FOR **STEEL RAILS** FOR DELIVERY DURING THE SEASON OF 1912

Parties intending purchasing will find it to their interest to let us have their specifications at an early date so as to insure desired deliveries.

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THE WORLD'S GREATEST AIR TOOLS

INDEPENDENT PNEUMATIC TOOL COMPANY
CHICAGO NEW YORK

FOR SALE IN CANADA BY
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PISTON AIR DRILLS

ARE GUARANTEED 30% MORE EFFICIENT THAN ANY OTHER MAKE.

They have the *Corliss Valve Motion*, conceded by Engineers to be the greatest valve mechanism used in any air drill. Are equipped with *Telescopic Screw Feed*, allowing for the longest range in drilling. Are made in all capacities suitable for drilling, tapping, reaming, rolling flues, wood boring, stay-bolt work and close corner work.

Don't fail to give these machines a trial. Write for circular G and our proposition before placing your order.

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Iron Ore, Pig Iron, Car Wheels
Cast Iron Water and Gas Pipe, Specials
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Castings of All Kinds

Mooring Bollards for both Concrete and Wooden Docks.
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TRACTION METERS

The demand for Car Meters has grown very rapidly and the economies effected by the installation of these instruments have more than justified their use.

The guaranteed accuracy of the Ferranti Traction Meter is 2½ per cent. from full load to 1-10th load.

Will stand 100 per cent. overload for ten minutes.

Interesting data and attractive prices furnished on application to

Canadian Representative

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Tanks - Iron or Steel of all Kinds.
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We make a specialty of welded Tanks, without rivets or seams.

Structural Steel
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as well as ourselves against imitations, (always inferior to the genuine).
Our Canadian Patents, Nos. 131345, 131346, 131624 and 131625 cover the distinctive features that put

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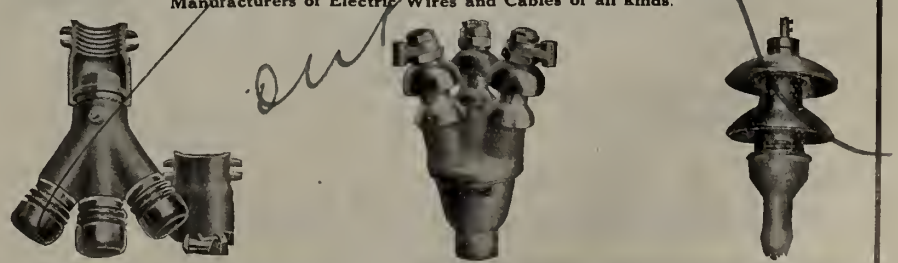
in a class by themselves as regards high quality and economical prices.

Write for complete information.

Standard Underground Cable Co., of Canada, Ltd.
Department C. **Hamilton, Ont.**

Manufacturers of Electric Wires and Cables of all kinds.



EDISON BSCO

PRIMARY BATTERY

The Standard Closed Circuit Cell

Clean cut service, so essential to the successful operation of a railway signal system, renders the practice of experimenting on any of its component parts, with material other than of the highest grade or proven worth, a somewhat questionable venture.

The system must give clean cut information, leaving no doubt in the mind of the man observing the indication as to just exactly what is meant. Its efficiency must be high, this being necessary to win confidence and respect of the engineman.

An unnecessary stop due to a signal failure with its wear and tear on equipment, waste of fuel and disarrangement of schedule are results that tend to place the department responsible in anything but a favorable light. It is not surprising, therefore, that failures occupy the place they do in the estimation of the signalman.

The source of current, if not absolutely reliable, is apt to cause the signal engineer serious concern. The requirements are severe, and unless the battery is designed correctly, made of the finest material, and in the most approved manner, it will not stand up under the strain.

This explains why EDISON-BSCO cells are used so generally in signal work. They have proven their worth, and the results obtained have justified the unceasing efforts made to have every cell or element that goes out from the works as nearly perfect as scientific methods and high grade material will produce.

Their adoption not only eliminates the worry incidental to battery trouble, but assists through efficient service in keeping operating expenses down where they belong.

The cheapest form of battery energy.

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that are absolutely necessary in

LOCOMOTIVE CASTINGS

ELIMINATES ENGINE HOUSE REPAIRS

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Sales Manager

Synopsis of Dominion Land Regulations.

Any person who is the sole head of a family, or any male over 18 years old, may homestead a quarter section of available Dominion land in Manitoba, Saskatchewan or Alberta. The applicant must appear in person at the Dominion Lands Agency or Subagency for the district. Entry by proxy may be made at any agency, on certain conditions by father, mother, son, daughter, brother or sister of intending homesteader.

Duties.—Six months' residence upon and cultivation of the land in each of three years. A homesteader may live within nine miles of his homestead on a farm of at least 80 acres solely owned and occupied by him or by his father, mother, son, daughter, brother or sister.

In certain districts a homesteader in good standing may pre-empt a quarter-section alongside his homestead. Price, $3.00 per acre.

Duties.—Must reside upon the homestead or pre-emption six months in each of six years from date of homestead entry (including the time required to earn homestead patent) and cultivate fifty acres extra.

A homesteader who has exhausted his homestead right and cannot obtain a preemption may enter for a purchased homestead in certain districts. Price, $3.00 per acre. Duties.—Must resiae six months in each of three years, cultivate fifty acres and erect a house worth $300.00.

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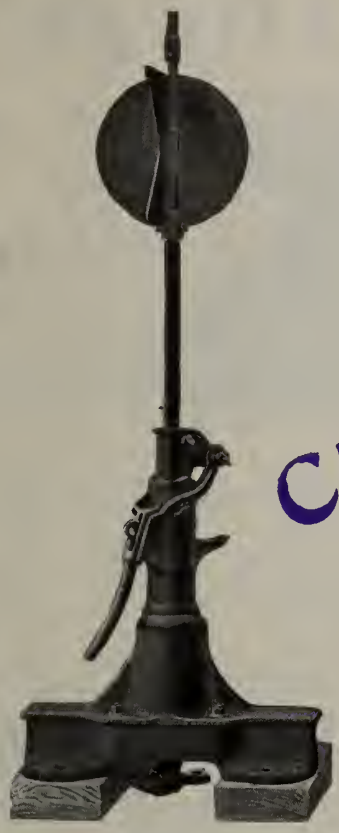

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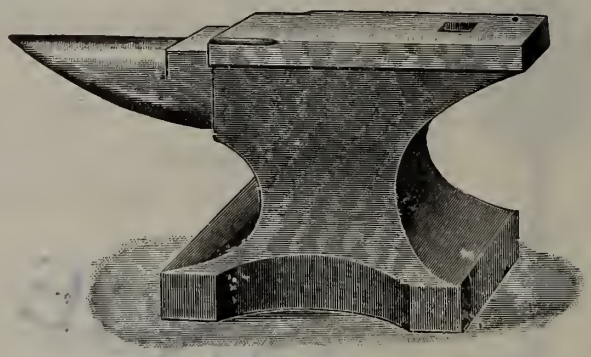

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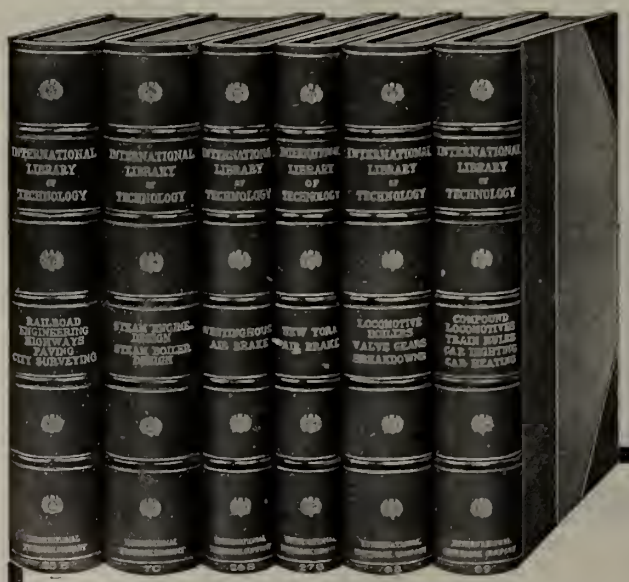

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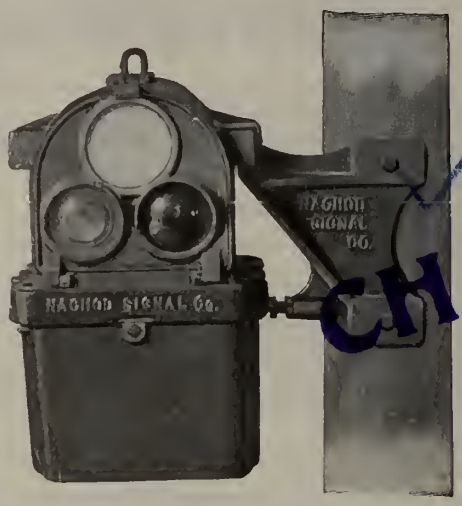

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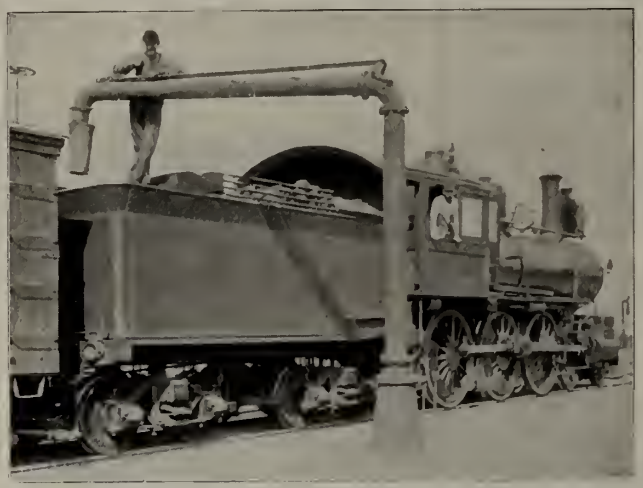

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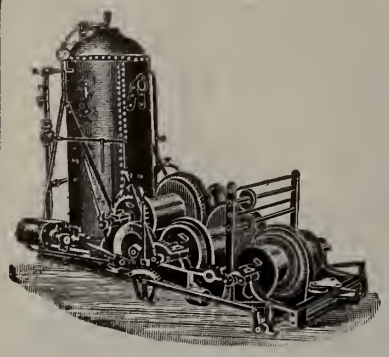

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American Vanadium Co...Pittsburgh, Pa
Files
Nicholson File Co. .....Port Hope, Ont.
Flags
The Hudson's Bay Co. .....
Flour
The Hudson's Bay Co. .....
Forgings
American Vanadium Co...Pittsburgh, Pa.
Canada Forge Co., Ltd. ....Welland, Ont.
Can. Billings & Spencer Ltd. Welland, Ont.
Canadian Car & Foundry Co....Montreal
Crossen Car Co. .....Cobourg, Ont.
Nova Scotia S. & C. Co. New Glasgow, N.S.
Steel Co. of Canada, Ltd..Hamilton, Ont.
Titanium Alloy Mfg. Co. .....Montreal
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Can. Ramapo Iron Wks.....Niagara Falls
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Continental Iron Works ..Brooklyn, N.Y.
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The Holden Co., Ltd. .....Montreal
McCord & Co. .....Chicago, Ill.
Gauge Cocks
Ohio Brass Co. .....Mansfield, Ohio
Gauges, Locomotive
Taylor & Arnold .....Montreal
Gauges, Water
Can. Detroit Lubricator Co., Windsor, Ont.
Gears
American Vanadium Co. ..Pittsburgh, Pa.
Titanium Alloy Mfg. Co. .....Montreal
Generators, Electric
Allis-Chalmers-Bullock, Ltd., ...Montreal
Canadian Gen. Elec. Co., Ltd.....Toronto
Northern Electric & Mfg. Co.....Montreal
Grates, Shaking
Babcock & Wilcox .....Montreal
Polson Iron Works, Ltd. .....Toronto
Grinders, Disc, for Wood and Metal
C. H. Besly Co. .....Chicago, Ill.
Groceries
The Hudson's Bay Co. .....
Hammers, Cast Steel
Am. Brake Shoe & Fdry Co.Mahwah, N.J.
James Smart Mfg. Co. Ltd. Brockville, Ont.
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Canadian Fairbanks-Morse Co...Montreal
Crossen Car Mfg. Co. .....Cobourg, Ont.
Dominion Equip. & Supply Co..Winnipeg
F. H. Hopkins & Co. .....Montreal
Mussens, Ltd. .....Montreal
Rice Lewis & Son .....Toronto
Hangers, Cable
Standard Underground Cable Co. Hamilton
Hardware
The Hudson's Bay Co. .....
Rice Lewis & Son .....Toronto
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Commercial Acetylene Co. .....Toronto
Pyle National Elec. Headlight Co..Chicago
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Crossen Car Mfg. Co. .....Cobourg, Ont.
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Robb Engineering Co., Ltd.Amherst, N.S.
Heating, Car
Canadian Gold Car H'g & L'g Co..Montreal
Consolidated Car Htg. Co....Albany, N.Y.
Safety Car Heating & L'g Co...New York
United States Light & Heat Co.New York
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F. H. Hopkins and Co. .....Montreal
Heating, Roundhouse and Power House
F. H. Hopkins and Co. .....Montreal
Hoists, Pneumatic
Taylor & Arnold .....Montreal
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Steel Co. of Canada, Ltd..Hamilton, Ont.
Hoppers, Car, Wet or Dry
Duner Co. .....Chicago, Ill.
Hose, Air Brake and Steam
Safety Car Htg. & Ltg. Co....New York
Guilford S. Wood .....Chicago, Ill.
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Canadian Fairbanks-Morse Co...Montreal
Kerr Engine Co. .....Walkerville, Ont.
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Canadian Gen. Elec. Co., Ltd.....Toronto
Ohio Brass Co. .....Mansfield, Ohio
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Canadian Ry. Accident Ins. Co...Ottawa
Imp. Guarantee & Acc. Ins. Co..Toronto
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Canadian Steel Foundries, Ltd...Montreal
Railway Signal Co. of Can., Ld..Montreal
Saxby & Farmer, Ltd. .....Montreal
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Iron, Pig
Nova Scotia S. & C. Co.New Glasgow, N.S.
Steel Co. of Canada, Ltd....Hamilton, Ont.
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E. L. Drewry .....Winnipeg
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F. H. Hopkins and Co. .....Montreal
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Northern Electric & Mfg. Co.....Montreal
Lamps, Gas
Commercial Acetylene Co. .....Toronto
Safety Car Htg. & Ltg. Co.....New York
Lamps, Incandescent
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Canadian Westinghouse Co.Hamilton, Ont.
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Mussens, Ltd. .....Montreal
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International Marine Signal Co. ..Ottawa
Safety Car Htg. & Ltg. Co.....New York
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Canadian Gold Car H'g & L'g Co.Montreal
Commercial Acetylene Co. .....Toronto
Safety Car Heating & Ltg. Co.New York
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Commercial Acetylene Co. .....Toronto
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Dominion Equip. & Supply Co..Winnipeg
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International Marine Signal Co. ...Ottawa
Montreal Locomotive Works .....Montreal
Locomotives, Contractors'
Dominion Equip. & Supply Co..Winnipeg
F. H. Hopkins and Co. .....Montreal
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Montreal Locomotive Works .....Montreal
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F. H. Hopkins and Co. .....Montreal
Locomotives, Rack
Canadian Locomotive Co...Kingston, Ont.
Montreal Locomotive Works .....Montreal
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Machines, Milling
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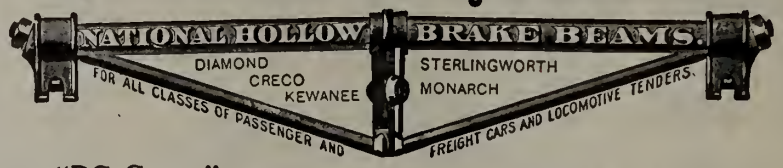

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Nova Scotia S. & C. Co.New Glasgow, N.S.
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Babcock & Wilcox .....Montreal
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Edison Storage Battery Co. ..Orange, N.J.
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Switches, Electric
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Geo. C. Royce .....West Toronto, Ont.
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Switch Targets
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Corbet Fdry. Co., Ltd..Owen Sound, Ont.
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Commercial Acetylene Co. .....Toronto
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Butterfield & Co. .....Rock Island, Que.
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Northern Electric & Mfg. Co....Montreal
Telegraph and Telephone Office Signs
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Thermit
Goldschmidt Thermit Co. .....Toronto
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Jas. W. Pyke & Co. .....Montreal
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Pratt & Whitney Co. .....Dundas, Ont
James Smart Mfg. Co. Ltd. Brockville, Ont.
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John Bertram & Sons Co...Dundas, Ont.
Canadian Steel Foundries, Ltd..Montreal
B. J. Coghlin Co. .....Montreal
F. H. Hopkins & Co. .....Montreal
Mussens, Limited .....Montreal
Tools, Pneumatic
The Holden Co., Ltd. .....Montreal
Independent Pneum'c Tool Co.Chicago, Ill
Tools, Cast Steel
American Brake Shoe & Fdry. Co.Mahwah
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F. H. Hopkins and Co. .....Montreal
Tramway Equipment
J. J. Gartshore .....Toronto
F. H. Hopkins and Co. .....Montreal
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Canadian Gen. Elec. Co., Ltd.....Toronto
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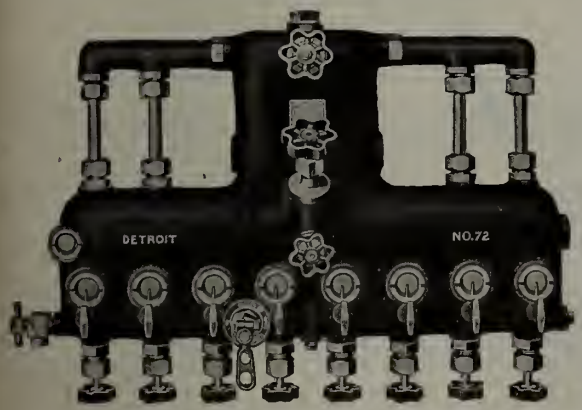

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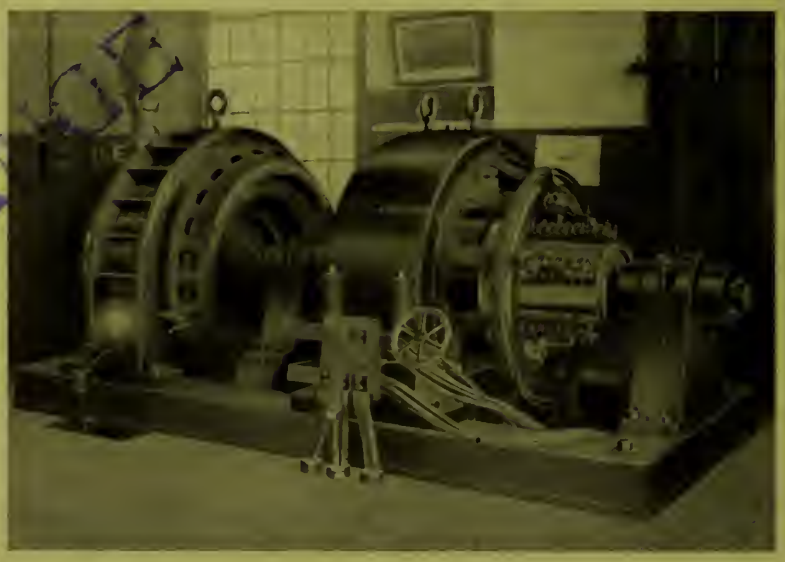

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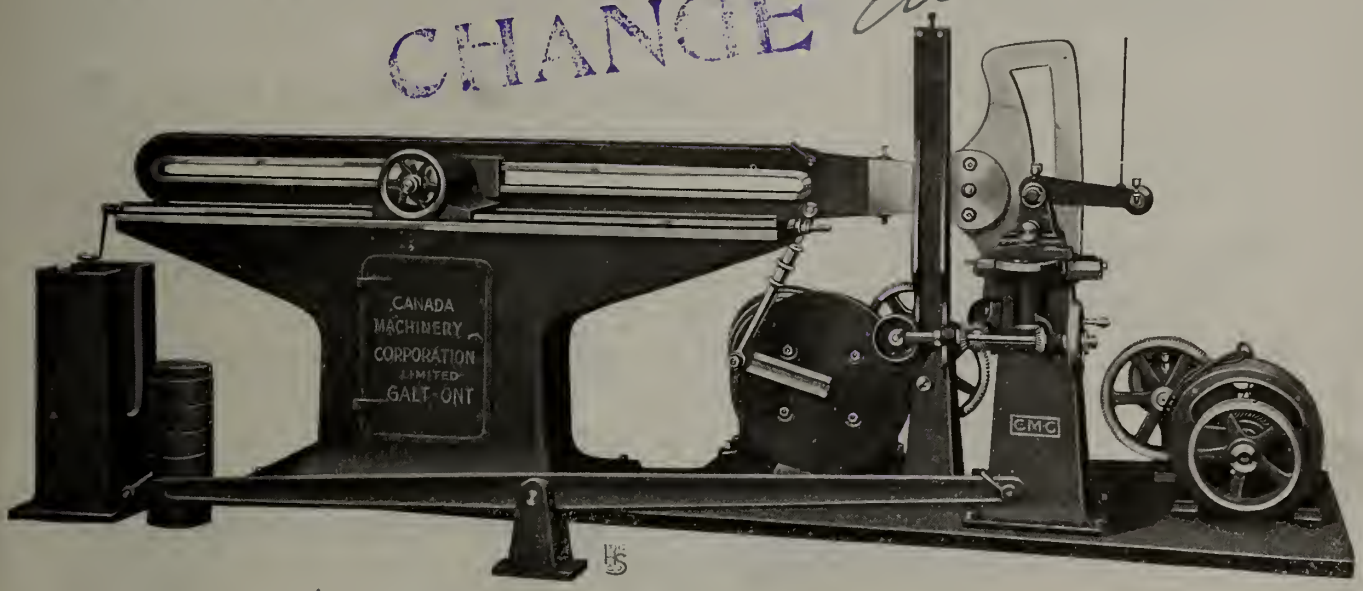

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Laid April 1st, 1911.
Measured October 31st, 1911.
In service when measured, 214 days

Average wear in square inch (for all rails)

	Open-Hearth	Titanium Open Hearth
In 214 days	.755	.537
Per 1,000,000 tons	.0686	.0488

Test rails laid alternately on high side of track.
Radius of curve, 100 feet.
Grade, 5 per cent. down.
Track elevation, 3 inches.

Ratio of Wear
For all Rails
Titanium to Open-hearth
1 to 1.41

CHANGE

Titanium rails cost only about $2 more per ton than untreated rails. When you order, specify that our men shall look after the Titanium addition. On this condition we will make no charge for their services.

TESTS ON SOME OTHER ROADS

Boston & Maine 55 p.c. to 186 p.c. . in favor of Titanium Rails.
(Showing that as the trial continues, the figures improve in favor of Titanium as evidenced by previous measurements already published.)
Lehigh Valley 54 p.c. . . in favor of Titanium Rails.
Baltimore & Ohio 56 p.c. . . in favor of Titanium Rails.

Booklet No. 22 explains in detail the superiority of Titanium-treated iron and steel. Rail diagrams of above tests gladly sent on request.

Output of Titanium Steel in 1910 was 326,300 gross tons.
Output of Titanium Steel in 1911 increased to 410,600 gross tons.

Titanium Alloy is made for Canadian Consumption by Electro Metals, Ltd., Welland, Ont.

TITANIUM ALLOY MANUFACTURING COMPANY

Manufactured in Canada under Rossi Patents. Processes and Products Fully Patented.

Pacific Coast Agents
ECCLES & SMITH CO.
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630-631-632 Oliver Bldg.
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MONTREAL.

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Primos, Delaware County,
Pennsylvania

C. G. E. Gas Electric Cars

The Gas Electric Car

Electricity is the silent and efficient transmission link, furnishing, power and brilliant illumination.

Is materially reducing operating costs and increasing traffic on brancn railway lines wherever used.

The records of thousands of miles of operation in actual service prove the usefulness and reliability of this car.

Built as a Railroad Proposition

Strong, reliable, efficient and attractive. M. C. B. throughout. Just as the trolley car successfully displaced the horse car, so with equal success and profit the C. G. E. Gas Car is now replacing branch line trains.

Catalogue 4855 illustrates and describes the equipment and shows many car body designs. This will be sent you by return mail for the asking.

Canadian General Electric Co.

Limited

Toronto Montreal Halifax Ottawa Cobalt

Winnipeg Calgary Vancouver Nelson Prince Rupert

THE
Steel Company of Canada
LIMITED

Railroad Track Equipment
Angle Bars Tie Plates
Steel Track Spikes Bolts & Nuts

PIG IRON
Foundry Basic Malleable

Car Axles and Forgings
Invincible Fencing
Bar Iron Bar Steel

Arm Braces Wood and Machine Screws
Copper Trolley Wire, Telephone and Galvanized Wire
Nails Tacks Wrought Pipe

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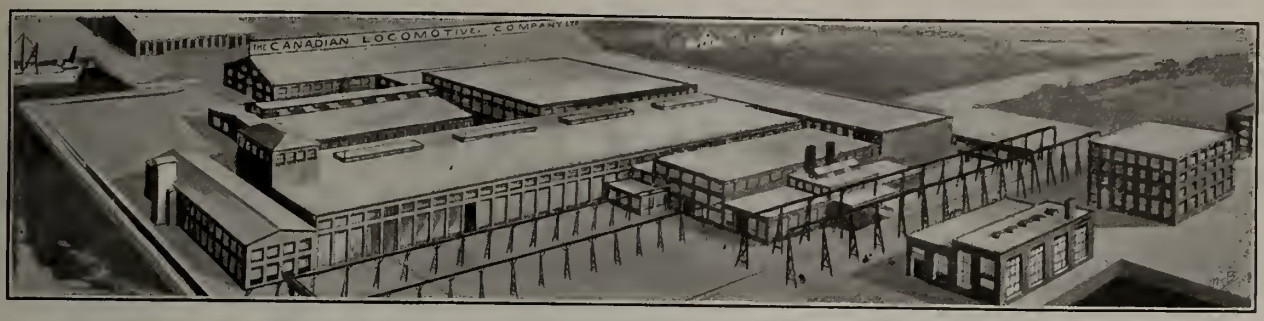
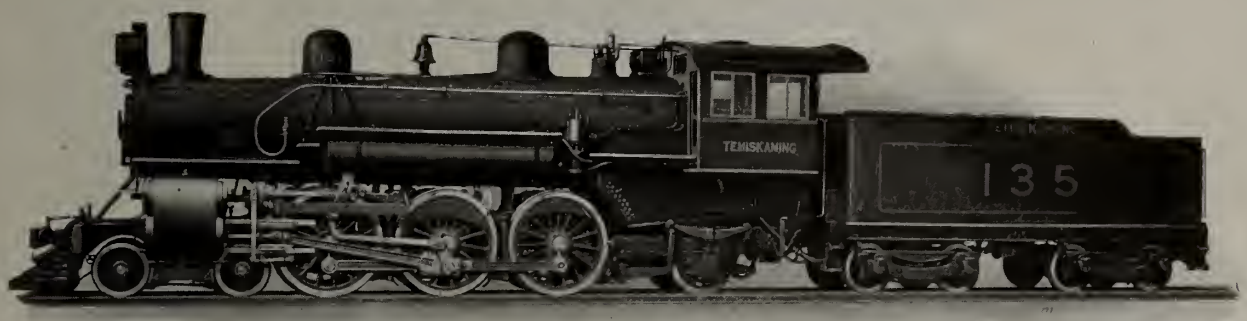
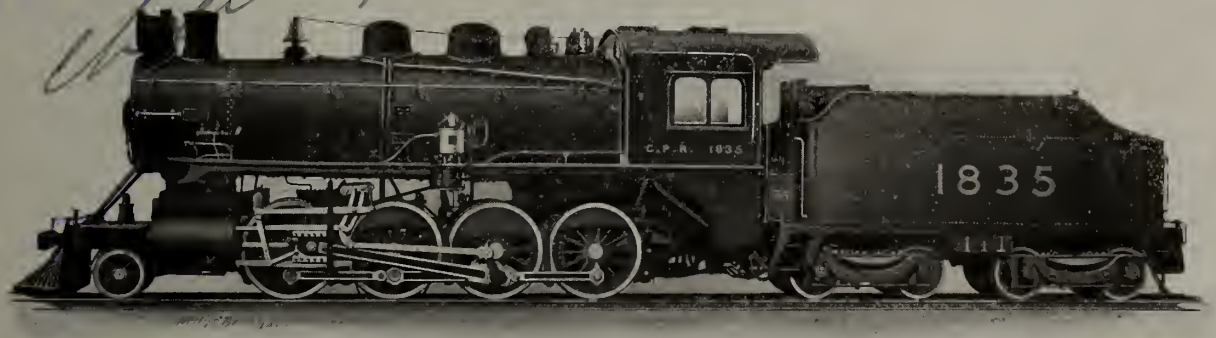




Pacific Type Locomotive, built for the Timiskaming and Northern Ontario Railway.

Total weight of engine in working order	203,100 pounds
Weight on driving wheels	133,375 pounds
Diameter of driving wheels	69 inches
Boiler pressure	200 pounds
Cylinders	21 x 28 inches
Maximum tractive power	30,000 pounds



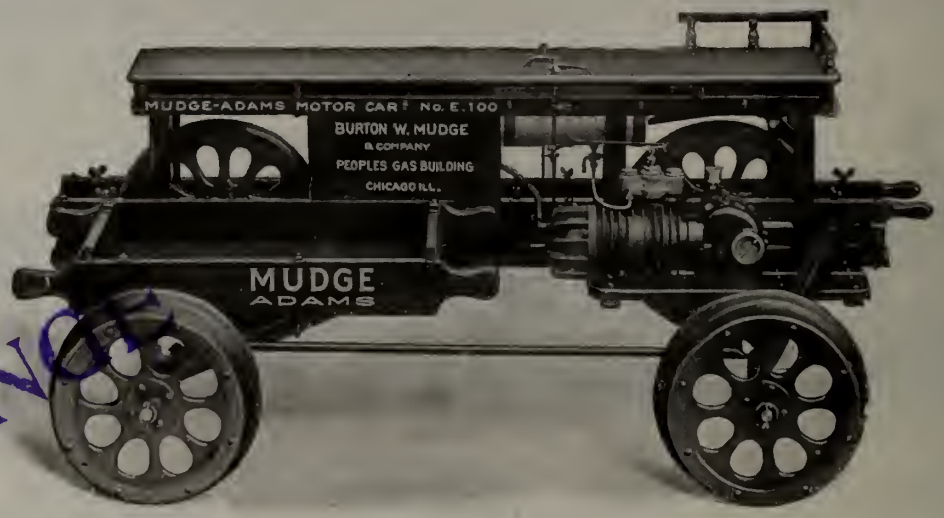
Consolidation Locomotive, built for Canadian Pacific Railway

Total weight of engine in working order	221,800 pounds
Weight on driving wheels	192,600 pounds
Diameter of driving wheels	63 inches
Boiler pressure	180 pounds
Cylinders	23½ x 32 inches
Superheater	Vaughan-Horsey
Maximum tractive power	43,000 pounds

Canadian Locomotive Co., Ltd.

KINGSTON, ONTARIO

ADAMS MOTOR CAR



CHANGE

This Inspection Car will help you in your Inspecting and will also stand your Inspection.

The MUDGE-ADAMS is the lightest Four Horse-Power Car made. Every working part is easily accessible and so simple in construction that it is practically trouble proof.

One man can handle this car on and off the rails, and it will carry three men, tools and supplies.

All the Features of the Car with specifications are contained in our circular, which we will be pleased to mail promptly on receipt of request.

Sole Canadian Agents

MUSSENS LIMITED

Head Office: MONTREAL

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Power Cost

is of Prime Importance in every factory.

We can positively demonstrate to **your** satisfaction that we can give you a 100% investment---Can prove it in dollars and cents.

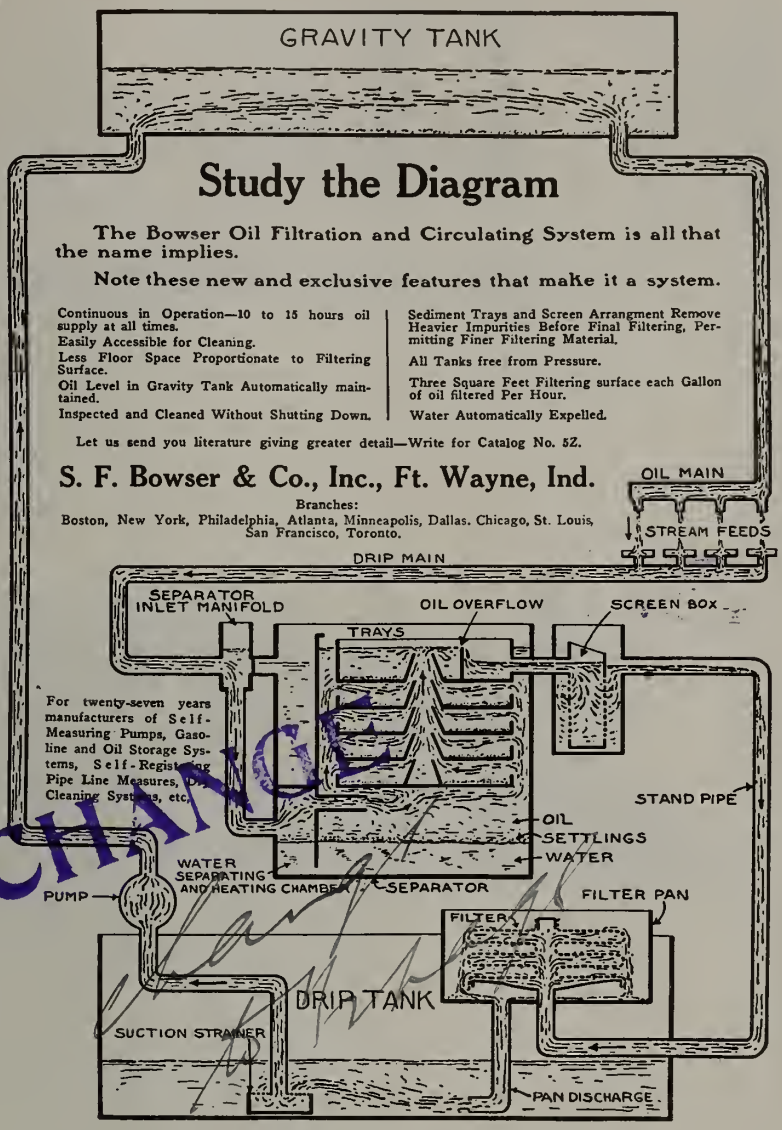
It is actually possible to save 60% per h.p. per year with a Bowser Oil Filtration and Circulating System.

Just a "nod" from you will bring the proof and it will incur no obligation.

Note The Formula

We give above the proper comparative basis on which to consider oiling systems. In this day every engineer or manager wants to know what he is buying. Don't accept somebody's statement that an oiling system will do certain things—Use the formula above and figure it out for yourself. Cut out the tables and file for reference.

When you buy a boiler you demand the amount of heating surface—On the same basis of reasoning, why not demand the amount of filtering surface in an oiling system?



The Bowser Oil Filtration and Circulating System

possesses the following exclusive features which account for its superiority:

Continuous Operation--10 to 15 hours' Oil Supply at all times.

Easily Accessible for Cleaning.

Less Floor Space proportionate to filtering Surface.

Oil level in Gravity Tank Automatically Maintained.

Inspected and Cleaned without shutting down.

Sediment Trays and Screen Arrangements remove heavier impurities before final filtering, permitting finer filtering material.

All Tanks free from pressure.

Three sq. ft. Filtering Surface for Each Gallon of Oil per hour to be filtered.

Water automatically expelled.

Here's another reason for Bowser service and success: Our corps of engineers is ready to look over your plant and give expert advice, not only on a proper oiling system, but on other arrangements as well, that will improve your service and cut your cost. This special service is gratis, and does not obligate the enquirer in any way. All we want to know is that you are interested in reducing the cost of your power and engine room maintenance.

Ask for Catalogue No. 18.

S. F. BOWSER & COMPANY, Incorporated, Toronto, Ont.

66--68 Fraser Avenue

TEN WHEEL LOCOMOTIVE

CANADIAN NORTHERN RAILWAY

Total weight of engine, 154,000 pounds.
Weight on drivers, 112,500 pounds.
Diameter of drivers, 57 inches.
Boiler pressure, 170 pounds.
Cylinders, 20 x 24 inches.
Maximum tractive power, 24,300 pounds.

MONTREAL LOCOMOTIVE WORKS, LTD.

DOMINION EXPRESS BUILDING, MONTREAL, CANADA

VANADIUM

The Steel of Ultimate Quality

Elasticity Strength Toughness Endurance

Chrome Vanadium
Rolled Steel Wheels

CHANGE

In service under passenger locomotive tender for three years
Present mileage - - - 258,529 miles
Average per 1-16″ diameter wear, 11,240 miles

Our Ferro-Vanadium is the Standard for Making Vanadium Steel.
Booklets and expert advice on application.

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Largest Manufacturers of Vanadium Alloys in the World

Immediate Shipment any quantity

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THE SIMMEN SYSTEM

Approved by the Railroad Commission of the State of Indiana for Use in That State.

The Simmen System of Railway Signalling and Train Despatching is a cab signal system of remarkable simplicity, which has been proved successful at the highest speeds and under all possible weather conditions. All the advantages inherent in cab signal systems are fully realized in combination with an efficiency of the highest order. Visible light signals in the cab, "Clear" or "Danger," as the case may be, are continuous and positive, and the changes from one to the other vivid and unmistakable. The risk of missing fixed signals on the roadway in fog or snowstorm is entirely obviated. Consequences of oversight thoroughly guarded against. Head-on collisions are prevented by interlocking of automatic electric switches on the Despatcher's table, and stop signals are displayed at a safe distance from sidings.

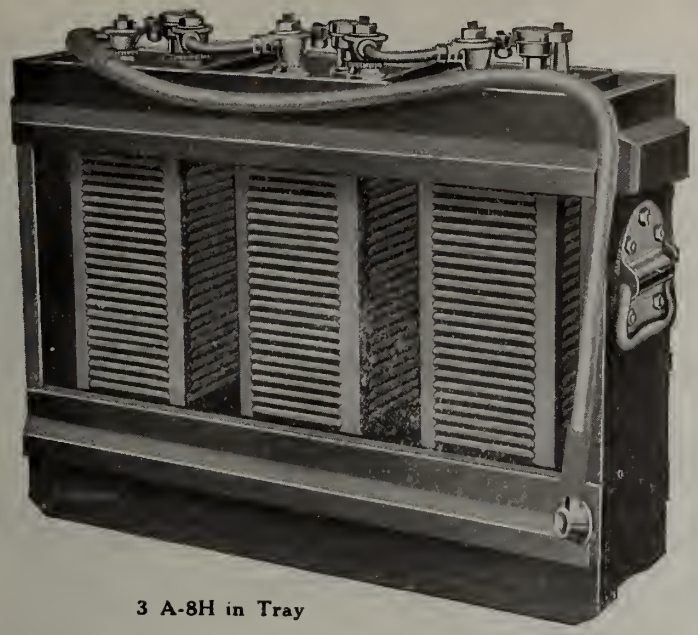
False "Clear" signals are an impossibility, since any derangement of any circuit automatically causes the display of a red light. Third (contact) rails at every siding permit of telephone communication between cab of engine and Despatcher's office. Cost of installation much less than that of other systems and cost of maintenance practically nominal.

Despatcher's Table

Full particulars and descriptive matter on application to

NORTHEY-PLUMMER, LIMITED

Confederation Life Chambers, - TORONTO



3 A-8H in Tray

The Advantages of the EDISON STORAGE BATTERY

For Axle Train Lighting Systems

The peculiarities of the axle generator system of train lighting, due to the necessities of transportation, are such that a storage battery is manipulated in anything but a normal manner. Sulphation, buckling, failure through overcharge, and rapid deterioration through idleness, when partially discharged, are factors which militate against the life and usefulness of the lead cell with this system.

Sulphation, for example, causes high voltage indications, rendering the automatic features of modern axle lighting systems inoperative at such times as would give false indications of fully charged batteries.

The Edison battery will retain its original capacity no matter how the output of the axle generator fluctuates or how quick the rate of discharge, and it will remain in a discharged condition for an unlimited length of time without any deterioration. Unlike the lead cell, Edison plates have the same dimensions from the time they are put into service to the end of their useful life.

CHANGE

The great physical strength of Edison battery construction enables it to resist continued vibration and concussion.

Saving in weight for the same ampere hour capacity is another big advantage of the Edison battery for every type of train lighting system. The amount of money saved in haulage costs alone would establish the economy of this battery for train lighting, even if it did not possess a single one of the notable advantages mentioned above. On a 32 volt system, this battery saves one ton per installation. This annually amounts to 108,000 ton miles per car.

Send for our newest bulletin, No. 1018, "Edison Train Lighting Batteries."

The Canadian Fairbanks-Morse Company
Limited

Montreal St. John Ottawa Toronto Winnipeg Saskatoon Calgary Vancouver Victoria

POLSON IRON WORKS, Limited

Steel Shipbuilders

Engineers and Boilermakers

Dredges, Hydraulic and Dipper Type; Steel Steamers, full Canal Size; Tugs, Barges and Scows

Marine Engines and Boilers--all sizes

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are being used extensively by

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Our "Hart" Cars can be used as follows:

Centre Dump Ballast Cars, Side Dump Construction Cars, Side Door Gondola Cars.

Capacities 30 to 50 tons. All Wood. All Steel, or Composite Construction.

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Can be used in a variety of services.

For Coal, Coke, Ore and General Service.

All capacities. All Wood or All Steel, also Composite Construction.

We would like to mail you booklet, illustrating and describing these cars in operation under all sorts of conditions.

THE HART-OTIS CAR CO., LIMITED

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CRANES

"Industrial"

Wrecking, Locomotive and Coaling Cranes

In Capacities of from Five to One Hundred and Twenty Tons.
For use about

Railroads, Manufacturing Plants, Coaling Stations, Quarries.

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BY USING THE
TATE FLEXIBLE STAYBOLT

TIME HAS DEMONSTRATED

FIRST—that flexible staybolts produce more satisfactory and more economical results than rigid staybolts.
SECOND—that TATE FLEXIBLE STAYBOLTS are best of all, measured by every standard.

Ask for our New Catalog just issued

KEEP STANDING

Manufactured and Sold in Canada by

CANADA FOUNDRY COMPANY, Limited, General Offices, TORONTO, ONT.

FLANNERY BOLT COMPANY, Vanadium Building, Pittsburgh, Pa.

Wire Rope

We manufacture and carry in stock all sizes and lengths of wire rope. Wire Rope suitable for Hoisting, Haulage, Guys, Towing, Dredges, Transmission of Power, Grain Shovels, Switch Ropes, Derricks, Wrecking Cranes, Elevators, Bridges, Ballast Unloaders, Etc.

We manufacture special ropes to suit any requirements.

We carry in stock **Blocks, Clips, Thimbles, Hooks, Turnbuckles, Shackles, Etc.**

OUR NEW CATALOGUE

Our new Catalogue, which illustrates and lists all kinds of wire rope is now ready for distribution. We will gladly mail copy upon request to any interested party. Drop us a line at once as this catalogue will prove useful.

THE DOMINION WIRE ROPE CO., LIMITED, Montreal

CANADIAN NORTHERN

Canadian Northern Ontario Railway

Toronto - Ottawa Line

In operation to Oshawa, Bowmanville, Orono, Port Hope, Cobourg, Trenton, Belleville and Napanee

with connection at Trenton for Picton and other C.O.R. Stations

Through fares include bus fare and hand baggage transfer to Oshawa Town and Bowmanville Town

¶ Trains run to and from Union Station, Toronto, Union Station with Central Ontario Railway, Trenton, located in the centre of the Town.

Solid Wide Vestibuled Trains.
Parlor Car and Dining Car Service.
Toronto, Parry Sound, Sudbury and Ruel Line

Through Service to Sudbury, Sellwood and Ruel. Daily, Sunday excepted.

Ruel is the Gateway to the Mining Camps at Shining Tree, Gowganda and other new Camps where large operations are under way.

There are many business opportunities along this line.

¶ Write for new folder showing time tables of Canadian Northern Eastern and Western Lines, with maps and full information about the Canadian Northern System, Railways, Steamships, Hotels, Express and Telegraph Service.

R. L. FAIRBAIRN, General Passenger Agent.

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ROYAL GEORGE and ROYAL EDWARD

Their equipment and interior appointments are of the most luxurious and modern description, and all the conveniences and comforts that make for an enjoyable voyage have been thoroughly anticipated. Marconi wireless, deep sea telephones, passenger elevators, thermo-tank system of ventilation, superbly appointed cabins.

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A supply man contends that one flaw in the construction of our brake shoe is that the narrow steel lug of the shoe wears out the cast iron lugs of the brake-head.

The weight and lateral pressure on the shoe due to the rotation of the wheels is taken only by the feet of the brake-head which bear against either end of the shoe. The centre lugs of the brake-head serve only to lock the shoe on and transmit the braking pressure to the shoe. The steel lug of the shoe does not bear on the brake-head.

CHANGE

Canadian Brake Shoes Limited

334 St. James St., Montreal

Conditions Along the Line

are definitely understood by the dispatcher on the road equipped with

Northern Electric *Train Dispatching Telephones*

He can talk direct with the conductor and train crews at any point. The increased efficiency of this system of dispatching has been proved on over 50 leading railroads in Canada and the United States.

FOR FULL PARTICULARS ADDRESS DEPT. 3007

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Begs to announce

That their new Steam-Hydraulic Forge Shop is now in operation, as also is their recently installed "Harmet" Fluid Compression Plant.

These improvements bring "Scotia's" equipment abreast of the best Foreign Forges.

They are accordingly open to supply Forgings of all shapes and sizes, made of the Best Ordinary or Fluid Compressed Open-hearth Steel, and satisfying the most severe specifications.

For prices and particulars apply to

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ROLLING STOCK

PASSENGER FREIGHT AND ELECTRIC RAILWAY
RUGGLES' ROTARY SNOW PLOWS
CAR CASTINGS, FORGINGS AND REPAIR PARTS

CROSSEN CAR COMPANY, LTD.

COBOURG - ONTARIO

Bare and Insulated

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Copper and Aluminum
Copper Clad (Duplex Metal) Wire
Galvanized Steel Strand for Guys

CANADA WIRE AND CABLE COMPANY, LIMITED

1170 Dundas St., Toronto

Stock of Wire and Cable carried in Toronto, Montreal and Winnipeg.

Sales Agents { Roper, Clarke & Co., Ltd., Montreal.
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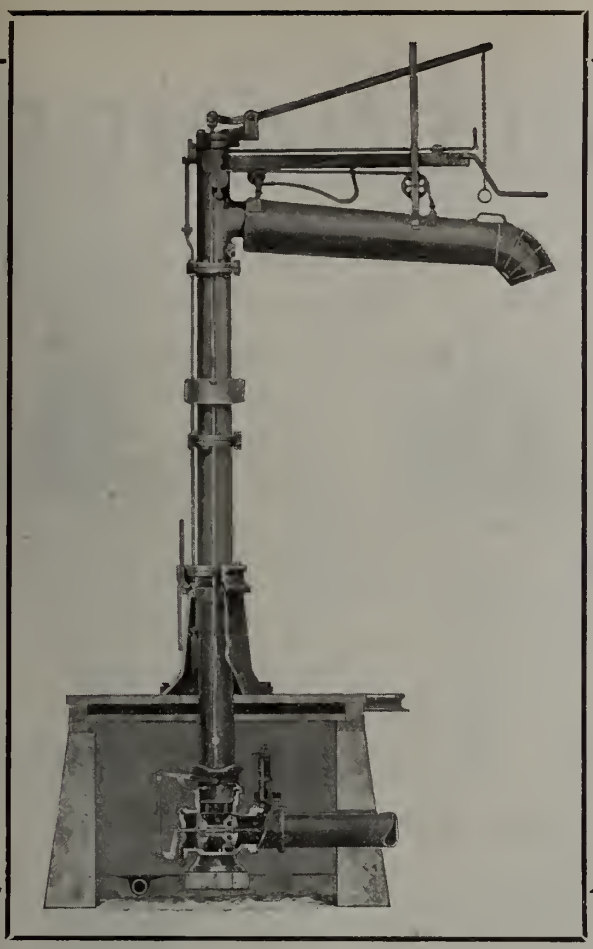

McAvity Improved Standpipe

Type G.

The McAvity Type G Standpipe, by its greater range of drop pipe, meets all requirements where different heights of tenders are in service. It is a combination of the Standaad Sheffield Valve with carefully designed upper works. The telescopic delivery spout excels all other such arrangements in strength, simplicity and convenience in operating

As there is no internal mechanism whatever in the McAvity Type G Standard, it is adapted for use in the coldest climate. Locks automatically and positively parallel with track when not in use.

Will revolve in complete circle. Operated by one man. Self-draining; cannot freeze. It is equipped with an automatic relief valve and water hammer is eliminated.

Prices on Application

T. McAvity & Sons, Limited

St. John, N.B.

Montreal Winnipeg Vancouver

Why the C. P. R. North Toronto Route to Ottawa and Montreal is the Logical One

The train leaves as follows:

Leave North Parkdale - - -	9.15 p.m.	Arrive Ottawa, 6.50 a.m.
Leave West Toronto - . -	9.30 p.m.	Arrive Montreal, 7.00 a.m.
Arrive North Toronto - - -	9.40 p.m.	Daily
Leave North Toronto - - -	10.00 p.m.	Will Stop at Westmount

Electric Lighted Compartment Cars and Standard Sleepers for both points.

¶ The North Toronto route is over an hour faster and overcomes a long hill climb for the train out of Toronto, obviating any inconvenience and ensuring early arrival at Montreal and Ottawa.

¶ The roadbed has been improved till it is unexcelled in Canada.

¶ The equipment is "Canadian Pacific Standard," a synonym for the "best" and attentive porters, ensure efficient service.

For Sleeping Car Space, Tickets, etc., Apply---

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TRACK MAINTENANCE

has been proved by the use of Continuous Weber and Wolhaupter base-supported rail joints—after fifteen (15) years' service, having a record of over **50,000 miles in use**—the extent of which is evidence of their excellence. Made in Canada.

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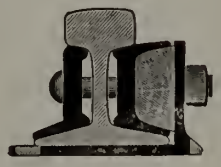
Paris, 1900;
Buffalo, 1901; St. Louis, 1904

Continuous Joint.

Over 50,000 miles in use.


Weber Joint.

Rolled from Best Quality Steel.

Wolhaupter Joint.

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OFFICES: BOARD OF TRADE BLDG., MONTREAL, CAN.

Makers of Base Supported Rail Joints for Standard and Special Rail Sections, also Girder, Step or Compromise. Frog and Switch, and Insulated Rail Joints, protected by Patents.

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WIRE DRAWN TUNGSTEN

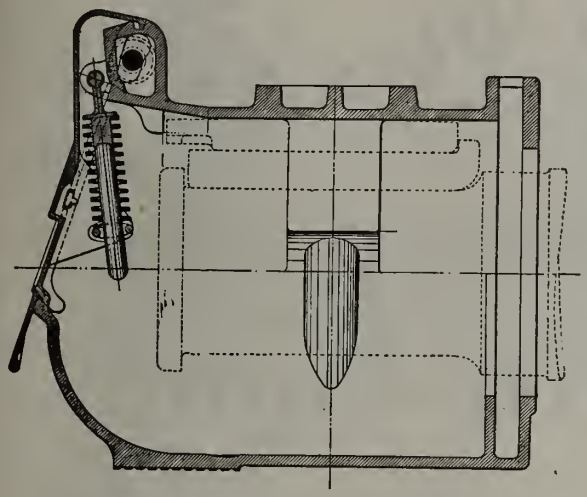
The Laco lamp is essentially the lamp for railway stations, railway sidings and railway cars.

It is a wire drawn tungsten lamp with an efficiency of less than 1.25 watts per candle. It has a strong filament that enables it to withstand vibration, it does not become discoloured and its average life is more than a thousand hours. It is the lowest priced lamp on the market.

F. NICOLAS & CO., LIMITED
119 Bleury St., Montreal.

The McCord Malleable Iron Journal Box

MANUFACTURED IN CANADA



The Strongest, Lightest, Tightest Box Made

The McCORD Draft Gear
The McCORD Spring Dampener

The McKIM Gasket
The McCORD Force Feed Lubricator

McCORD & COMPANY
People's Gas Building, Chicago

THE HOLDEN CO., Limited
354 St. James Street, Montreal

DOMINION EQUIPMENT AND SUPPLY COMPANY

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RAILWAY AND CONTRACTORS' EQUIPMENT

STEAM SHOVELS, HOISTING ENGINES, CRADOCKS' WIRE ROPES, CHAIN BELT CONCRETE MIXERS, BUDA MOTOR CARS, BEALL BROS.' TRACK TOOLS, AMERICAN WELL WORKS PUMPING MACHINERY, STROUD ELEVATING GRADERS AND WAGONS, KILBOURNE & JACOBS WHEEL AND DRAG SCRAPERS.

We have a complete list of Second-hand Machinery.

For prices and other particulars write to head office

45 and 46 Canada Life Building, - WINNIPEG, MANITOBA

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Pintsch Mantle Light

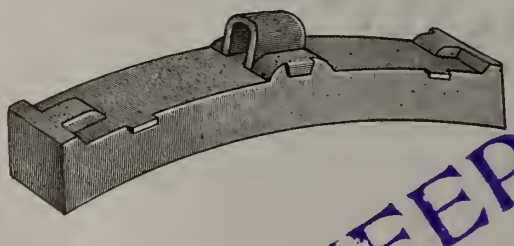
THE SAFETY CAR HEATING AND LIGHTING COMPANY

2 RECTOR STREET, NEW YORK

718 TRANSPORTATION BLDG., MONTREAL

Our Improved Reinforced

BRAKESHOES



RAILWAY BRAKESHOE

Are suitable for all classes of Electric and Steam Railways and Street Cars. They are fitted with an improved attaching lug which can be made of any desired thickness to suit the class of service, and requires no re-inforcing for retaining it in position and cannot be detached from the Steel Back.

They have an even co-efficient of friction throughout their whole life and a greater percentage of this shoe can be worn out than any other make of shoe on the market.

We stock all standard Brakeshoes suitable for Christy heads, etc. We contract on a guaranteed saving on your present aggregate cost.

Let us submit you further particulars.

Patents applied for in all countries.

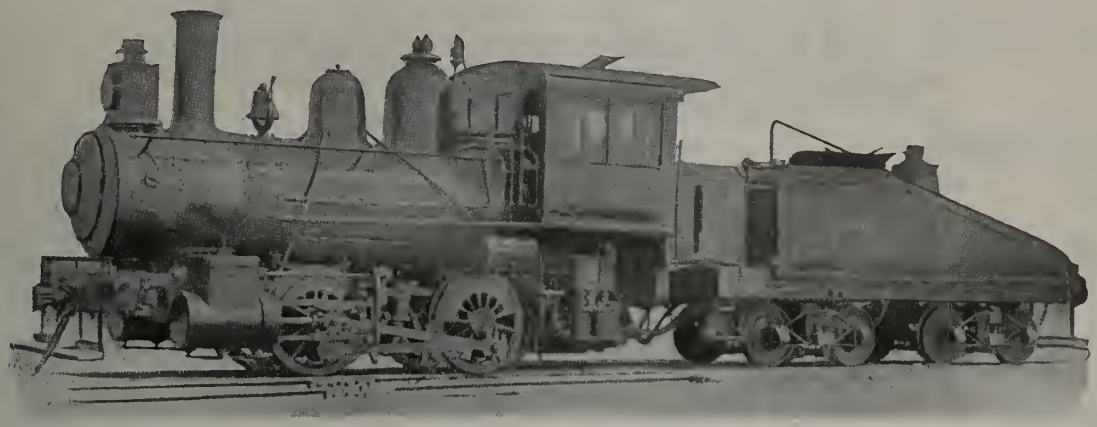
KEEP STANDING

Canadian Brakeshoe Company, Ltd.

SHERBROOKE, QUE.

40-Ton Four-Wheeled Switching Locomotives

BUILT AND REPAIRED IN PENNSYLVANIA RAILROAD SHOPS



CYLINDER, 17 INS. x 24 INS.
DRIVING WHEELS, 50 INS. DIA.
WHEELBASE, 7 FT. 0 INS.
WEIGHT ON DRIVERS, 80,200 LBS.

BOILER, BELPAIRE TYPE.
WORKING PRESSURE, 160 LBS.
TANK CAPACITY, WATER, 2.700 GAL.
TANK CAPACITY, COAL, 4 TONS.

CANADIAN EQUIPMENT COMPANY, Limited

TRANSPORTATION BUILDING
MONTREAL

The Longest Continuous Double Track Railway in the World under One Management and the only Double Track Line Between Montreal, Toronto, Niagara Falls, Detroit and Chicago.

GRAND TRUNK RAILWAY SYSTEM

Finest Roadbed in Canada. Modern and Luxurious Trains. Courteous Employees. Beautiful Scenery. The Best of Everything on this Popular Route.

4 Fast Trains, Two Express and Two Limited

Between Montreal and Toronto, Each Way, Daily

THROUGH TRAINS between BOSTON (via Boston & Maine R.R. and Cent. Vermont Ry.), MONTREAL, TORONTO and CHICAGO.

THROUGH TRAINS between NEW YORK, TORONTO and CHICAGO via Lehigh Valley R.R. and Niagara Falls.

Dining and Parlor-Library-Cafe Cars on Day Trains. Pullman Sleeping Cars on Night Trains.

The "International Limited"

The "Railway Greyhound of Canada," the finest and fastest train in the Dominion, runs every day in the year between Montreal and Chicago.

The Lines of this Great System reach all the Principal Cities and Towns in Quebec and Ontario.

W. E. DAVIS, Passenger Traffic Manager, Montreal. G. T. BELL, Asst. Pass. Traffic Manager, MONTREAL
H. G. ELLIOTT, Gen. Passenger Agent, MONTREAL

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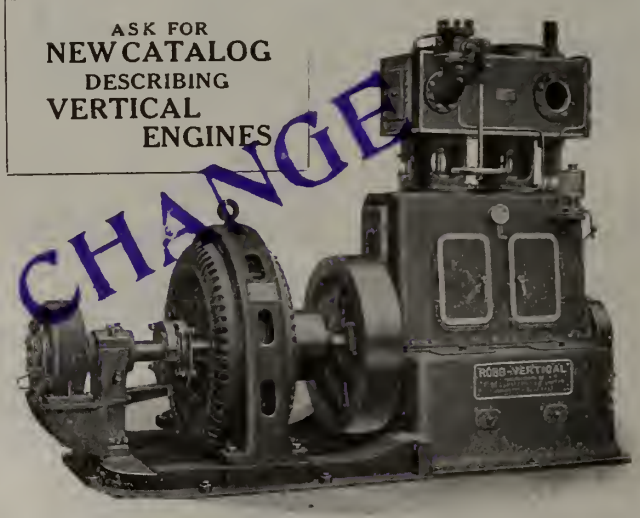

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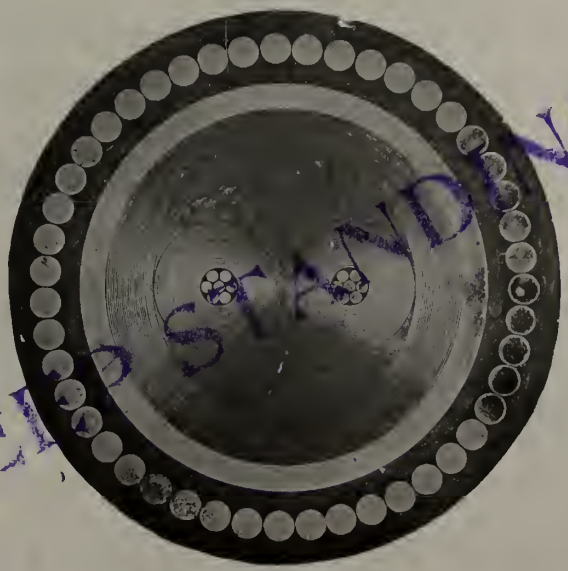

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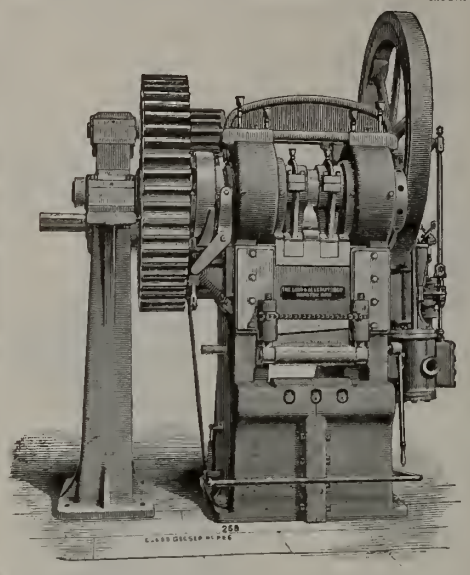

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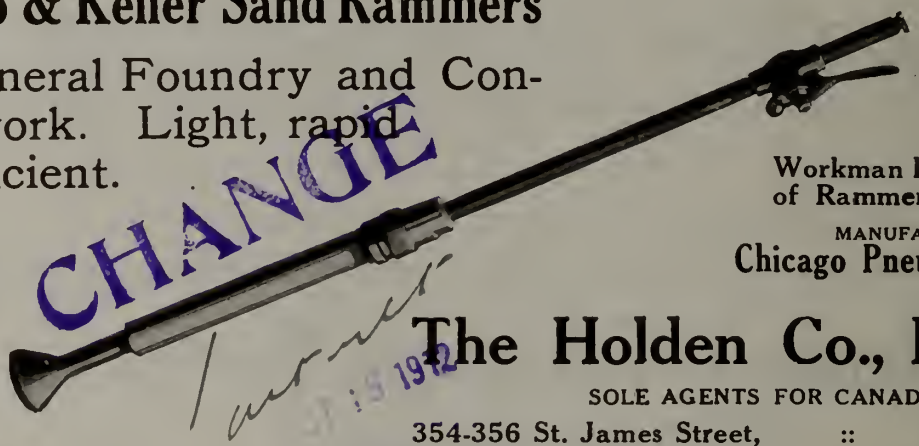

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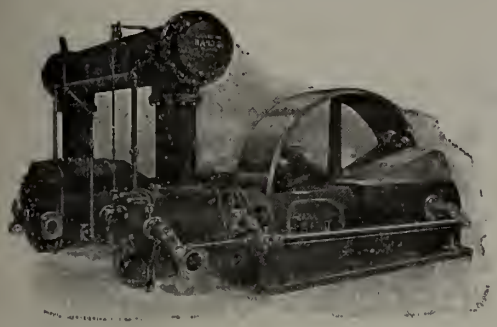

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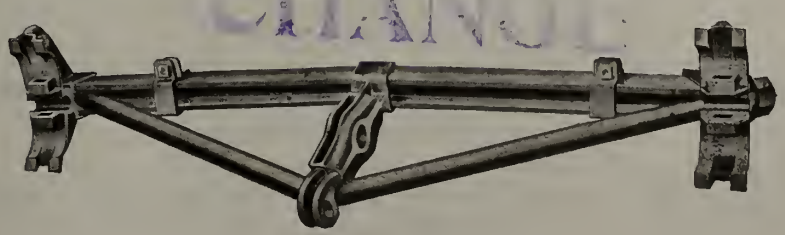

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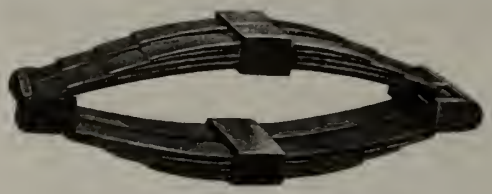

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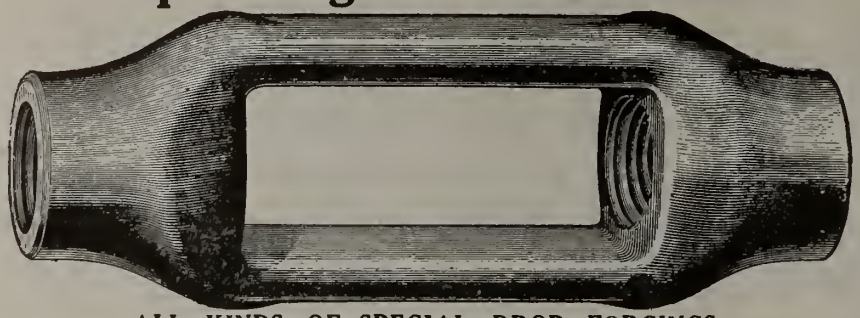

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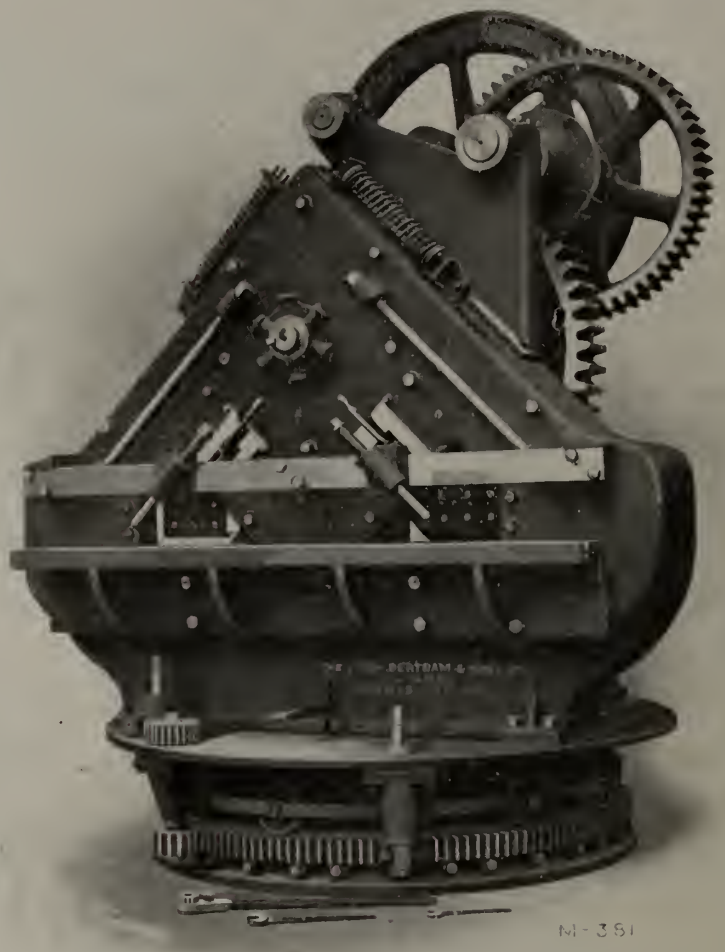

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Canadian Railway and Marine World.

October, 1912.

The Construction of a Steel Centre Sill Wooden Box Car at the C.P.R. Angus Shops.

By Frederick H. Moody, B. A. Sc.

Very few of the many people engaged in railway business have any inside information of the steps involved in the production of rolling stock in large quantities, most of the information generally at hand being that which deals with the repair of cars, and the general carpenter work incidental thereto. The production of cars by the hundreds is an entirely different proposition, involving different methods of preparation and assembly to those entering into the repair of cars or their production in small quantities. Everything is handled on such a large scale as to make the two conditions almost entirely foreign to each other. For that reason, and feeling that there is a desire for information of the methods used by the larger builders in the construction of cars, the article here presented was undertaken. As typical in many particulars of the practice of the large builders, and at the same time a process unique in itself, the methods employed at the Canadian Pacific Ry. Angus shops, Montreal, have been selected for the matter of description. The methods involved have been advanced to a very high degree of efficiency, and it is doubtful if there are any companies which can produce as high a grade of car more expeditiously than is possible in these shops. On four tracks, it is regular practice to turn out 40 cars a day of the type under discussion here, viz.: the steel centre sill wooden box car, large numbers of which have been added to the company's rolling stock during the last two years.

Fig. 1.—C.P.R. Steel Centre Sill Wooden Box Car.

Fig. 2.—First Step in Car Truck Assembling.

This car is constructed entirely of wood throughout, except for a steel centre sill, around which the car is constructed. This is a type of construction that has become fairly common on the bigger roads recently. The kind used by the C.P.R. is slightly different from those commonly to be found, the individuality of the designers entering into the construction to a certain degree. The car here considered is shown in fig. 1, the C.P.R. having several thousands now in operation.

THE TRUCK. Nearly all the parts entering into the construction of the car are made right in the works, very little of the material being purchased outside. In other words, the plant is practically complete in itself. The trucks are no exception, other than the bolsters, both truck and body.

The arrangement of the shops for the expeditious handling of the material in its passage through them in the course of manufacture and assembly is particularly worthy of note. The wheel foundry is located in a building to the rear of the truck shop, and from that building the wheels are taken to the rear end of the truck shop for machining. The casting of the cast iron wheels is such a familiar process that no particular description will be given of the process, the steps of the manufacture being taken up at the point where the cast wheels are delivered to the truck shop. At the rear of this shop there are several wheel boring mills, where the hubs are bored out to a standard gauge, and the process and movements on the parts of the operatives have been developed to such a degree that the cost of machining the wheels is reduced to a remarkably small figure. The axles are also turned down to the required dimensions in the same place, which is equipped with special axle turning lathes, and the same points regarding the cost of production may be here emphasized as well. It may be pointed out, however, that while the cost of production is remarkably low, the quality of the output has in no way been reduced, as the processes have been refined to such a degree, and the operatives are so familiarized with the steps involved, from the regularity of their employment on this class of work alone, that the quality is maintained with decreased operating expenses.

In the same part of the shop, there are a couple of wheel presses for the mounting of the wheels on the axles in the usual manner familiar to all. From that point, the wheels are run on to a through track running the length of the shop, each mounted wheel being run down this track as assembled. The length of the track provides ample storage capacity for any fluctuations in the rapidity with which the wheels are drawn off, and also when the wheels are mounted more slowly than usual.

Near the front of the shop, the awaiting axles of the mounted wheels have the axle boxes slipped over the ends, a whole batch being so mounted at one time by an operator going up one side and down the other, the boxes being piled up on each side of the track in a convenient manner. These boxes are first of all assembled with the dirt collar, etc., on the inner end, and are all ready for assembling at this stage.

Pairs of these wheels are next rolled along the track in the same direction to the position shown in fig. 2. To the left, on the other side of the assembling track, there is kept a pile of arch bars. On the other side of the track in fig. 2, there will also be noticed a pile of bearing brasses conveniently located to the assembling point. Into the axle boxes previously mounted on the axle ends, a journal brass is slipped into position, one in each. When two wheels are thus equipped, an arch bar is placed across between as in the illustration, in the correct position for finally bolting together, thereby assembling the wheels in the correct relation to each other. On top of each of the axle boxes, there are also placed two bolts of the required length, for convenience in the final fitting up. These bolts are obtained by the assemblers from bins conveniently located alongside the assembling track.

Two truck skeleton frames thus loosely thrown together are then run further on down the track to the point shown in fig. 3, where they are further added to by the

addition of the spring plank with the columns attached thereto. These spring planks may be noticed to the rear in fig. 3, where a small pile is kept for the operators, being constantly replenished from the rear of the shop, where the columns are rivetted to the spring plank, by a gang whose duty it is to see that the assemblers are provided at all times with all the necessary material to proceed with the work without delay. The spring plank, on being lowered into place by the jib crane to the rear, is fitted with the spring equipment between the columns at each end. This consists first of all of a couple of pieces of hard wood placed on the spring plank, on top of which is the four coil spring with guiding cap over top, carrying two rollers.

Passing the truck thus far assembled a little further along, places it in the position to the left in fig. 4, where the truck bolster is lowered into position on the truck between the guides. These truck bolsters are also kept in piles alongside of the track, as shown to the rear in this illustration, within range of the same jib crane used in the last operation of placing in position the spring plank on the truck. In the same position, the upper arch bar is placed in position from the store pile to the rear. With all these parts assembled, the column bolts are slipped into position in the column bolt holes, and the truck is then ready to be moved along to the position to the right in fig. 4, where the bolts on both sides of the truck are tightened up over spring washers by the operator. It will be noticed that along both sides of the track, there is a depressed channel, on the edge of which the operator can conveniently sit while tightening up the bolts. This channel is long enough for two trucks when there is a large gang operating at one time. At the same time as the truck bolts on both sides are being tightened up, the brake rigging members that belong to the truck are being put in position on the truck, so that on leaving this point, the truck in itself is entirely completed. Passing a little further along the shop, the body bolster is located over the truck bolster from the awaiting pile of these members near the door of the building. There is a swinging jib crane at this point for this purpose.

Fig. 3.—Second Step in Car Truck Assembling.

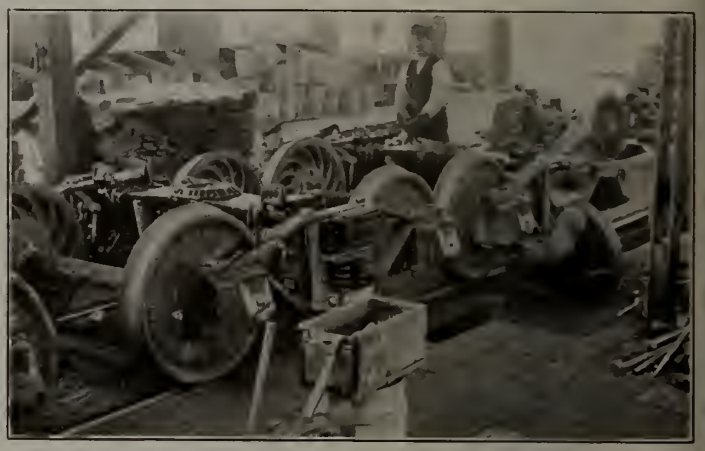


Fig. 4.—Final Step in Car Truck Assembling.

STEEL CENTRE SILL. The buildings which comprise the Angus shops are located along both sides of a central midway, which runs through the works. The truck shop is on the west side of the midway, with the freight car shop alongside. The blacksmith shop is across the midway from the truck shop, and located in the opposite direction from the car shop. It is at the rear of this blacksmith shop, in a small lean-to, that the steel centre sills are fabricated from the structural shapes that enter into their make-up. The constructional work on these is of the usual form, with the customary flangers, punchers, rivetters, etc. The sills as there produced are shown in fig. 5 to the right, in the row lying on the ground.

The sills shown in fig. 5 are on a tract of ground across the midway from the car shop. To the right of the midway crane column in this illustration, there is kept a store of steel centre sills from the shop at the rear of the blacksmith shop, from which the few shown on the ground are drawn by means of a steam yard crane operating on the industrial track to be seen in the lower right hand corner of fig. 5. Here the sills are equipped with the necessary draft rigging. The draft springs are temporarily bolted together between their end plates, and dropped into position in the coupler yoke. The coupler is then rivetted in, and the cover plate rivetted down over all as shown to the left in the illustration. Both ends are similarly equipped at the one setting, when the centre sill is ready for assembly into the car.

UNDERFRAMING. All the wooden parts entering into the assembly of the car are machined in the shop across the midway from the car shop, beyond the point of assembly of the sills shown in fig. 5. Alongside of this place is the point of assembly of the steel centre sill to the two trucks. There are two tracks for this operation, the process being carried on concurrently on both tracks. The trucks from the truck shop are run out on to turntables in a track running the length of the midway, run along this track, and by two other turntables can be run across to either of the tracks for the assembly of the sill to the trucks.

Between the two assembly tracks, as indicated in fig. 6, there is a pile of wooden side sills completely machined ready for assembling. On to two trucks located the proper distance apart, two of these side sills are dropped, the body bolster fitting into the notches in the lower face of the side sill, correctly aligning the car trucks, and squaring the body bolsters with regard to each other. When the trucks and body bolsters are thus squared up with regard to each other, the steel centre sill is placed in position on the two trucks, and the rivet holes aligned. Both ends are then rivetted to the body bolsters, making a perfect and permanent alignment of the underframing.

Fig. 5.—Fitting Draft Gear into Centre Sill.

Fig. 6.—Rivetting Centre Sill to Body Bolster.

The trucks thus located with regard to each other, and with the two wooden side sills resting loosely on the body bolsters, the whole is pushed across the midway into the position shown in fig. 7, in the car shop, where the balance of the underframing is put into position. Along this same track in the building, there is a long row of cars in different stages of advancement, so, in order to have them all pass through the shop uniformly, they are all connected together by chains or other connecting links at the couplers, so that between the different steps, the row moves forward one car length, leaving space for the entry of this skeleton car composed of trucks and centre sill.

THE BOTTOMING is the first operation in the series through which the car passes in working down the shop. There are seven men working on this operation, working together when required, and independently on the smaller parts. Everything runs as by clock work, every man knowing exactly what is expected of him. Very little fitting of any of the wooden members is required, as the machining in the wood-working department takes care of all fitting parts except in such places as it is more convenient or quicker to do the fitting right on the job.

The first step is the fitting of the side sills, which are resting loosely on the body steel centre sill are also placed. These are for the nailing of the decking.

The truss rods, bent in the shop in the manner described in Canadian Railway and Marine World, of Dec., 1911, are then slipped into position through the holes in the end sills, and after locating on the truss rod posts and under the queen posts, have the turnbuckles attached, and the end washers and nut screwed on, the outer truss rods being then tightened up, the inner ones not being tightened up at this stage, as the end timber has as yet to be added at a latter period in the car construction.

At this point in the proceedings, one of the workmen leaves the general work to assemble the air cylinder to its supporting frame preparatory to fitting to the needle beams as described. Another of the workmen, while the frame is being tightened up at all points, goes over the top surface of the frame thus far assembled, with a paint brush on the end of a stick, covering all the upper surfaces with a coating of red paint, thereby protecting the contact surfaces between the frame and the decking. It might again be emphasized that all the fittings and parts for the car are kept conveniently located to the assembling point at all the stages of erection. At this point, the fittings are kept in the row of bins in the rear in fig. 7, while the members are located in piles alongside of the assembling point.

Fig. 7.—Assembling Car Underframing.

Fig. 8.—Decking Car Top.

bolsters from the locating work they were called upon to perform in the yard. While recessed at the points where they rest on the body bolsters, cavities must be chopped in the bottom of the recesses for the sills to rest evenly over the rivets of the bolster. The side sills are then bolted to the bolsters through the base caps of the superstructure bracing, shown in fig. 7. At the same time, the four truss rod saddles are located on the bolster and bolted in place, and the same operation performed with the queen posts on the needle beams, the latter being then bolted to the side sills. The air cylinder on its supporting framework is then swung up into position under the needle beams, and bolted thereto.

The ends of the side sills, which have previously been tenoned in one direction only, have part of this tenon cut off to fit into the mortise of the end sills, which are loosely put in place. At the same time, the end bumper plate which goes between the end sill and the end of the steel centre sill, is slipped into position. The truck king pins are also dropped into place.

The framing is now ready to receive the wooden intermediate sills which are kept at hand in the pile to the right in the illustration. These are dropped in place and bolted close up against the outer truss rod posts. Similarly the lapping or strips laid on the

Between each pair of assembling tracks, there is a third track communicating directly with the wood-working shop across the midway, on which the stock is constantly replenished. Likewise the fittings, such as turnbuckles, end plates, etc., have limited stores in the bins mentioned, with greater stores outside the wall opposite the point where that particular part enters into the construction. The inside stores are replenished from time to time through doors located along this wall. Convenience is a strong point in the layout of this car building plant, and means a great deal towards the rapidity with which it is possible to turn out the cars.

DECKING. For the decking, the bottomed car is moved a car length further along the shop, a new gang taking up the work at this point, all the cars moving at the same time, each gang changing cars. Another car enters from the outside gang for the bottoming gang to commence operations upon.

The decking operation is shown in fig. 8. On it, seven men are engaged. As soon as the car is placed, the decking gang throw up on to the car from the pile to the right in fig. 8, sufficient decking to cover the car spacing it roughly along the length of the car. From a mark on the side sills at the centre of the car, the first deck plank is located squarely across the car and nailed. Working in both directions from this central plank, the balance is laid, the workmen nailing down every third or fourth plank in the edge at the matched strip. The planking is made to fit over any protruding bolt heads in the sills, by chopping out a recess in the lower face. The rest of the base castings for the superstructure framing are also located, and special length decking fitted around. The decking at the centre is slightly longer than that in the body of the car, from the fact that the door spaces are located there.

The decking having been nailed along the intermediate sills on every third or fourth plank, and this operation completed for some distance on each side of the centre, a workman follows along the different sills, driving in nails a short distance as in fig. 8, until they have been placed in each plank the length of the car. This workman then goes over the same nails with a light sledge, driving them home with a single blow. Thus every movement is made to count, and the planking is laid with the least possible amount of labor in the most expeditious manner.

SUPERSTRUCTURE. The most spectacular part of the car construction operation is the erection of the superstructure framing. While the last nails of the decking are being driven home, the train of cars is moved along another car length, and, at the same time, the workmen commence throwing on to the deck of the car the machined car belting rails, the work on which has been completed just previously, by an operator who attaches the upper bevel edges to the rail for the dislodgement of the grain for which the cars are constructed. The triangular shaped strip is nailed to the belting and sawn to the required lengths, and set aside ready to throw on the car as it is moved along the line. While the nailing of the decking is being completed, a workman from the superstructure gang goes over the deck surface and drills the diagonal and vertical holes through the decking for the small superstructure tie rods, completing the task before the car is ready to be moved along. The belting placed on the deck is located in pairs. The material for the superstructure diagonals is also placed on the deck in a convenient manner.

On the edges of the deck, the roof side plates are placed, and across the car on the deck between the side plates, the carlines are fitted with bolts at the ends across between the side plates lightly tightened up, and when tie bolts from the carlines through the side plates are located, all the bolts are tightened down carefully, making sure that the roof structure thus formed

is square. The ridge rail is also placed in position with the intermediate stringers.

While the latter members are being added to the roof frame, the corner and door posts are driven into the base castings, the roof frame having first of all been slipped to one side in order that the base castings might be exposed. Through the roof side plates, the tie rods are slipped by the workmen, leaving the roof structure and its fittings in the shape shown in fig. 9. It will be noticed in this illustration that there is an elevated platform near the level of the car roof, from which some of the assembling operations such as the driving of the posts are carried out.

The next step is to lift the roof structure at both ends by means of air hoists over both those points, resting the elevated structure on the tops of the awaiting posts, which have just previously been capped with end castings, similar to those used at the lower end. These fit recesses in the lower edge of the side plates. The diagonal bracing is also located in correct position as the roof is being located, thus forming a loose skeleton of the car frame. At the same time, the horizontal tie rods that are to pass along the belt railing are slipped into place, and loosely tightened.

The different diagonals and posts being located and the roof lowered into position, the next step is to fit the belt railing into place on all four sides of the car. There are two rows along the four sides, tightly fitting into place, making of themselves a very solid structure of the car framing. The frame is finally completed to the appearance shown in fig. 10, by the tightening up of all the various tie bolts in the framing. The rapidity with which this assembling of the roof frame and the putting together of the wall frame are carried out is nothing short of wonderful, and the observer is strongly reminded of the structures rapidly built up in the Arabian Nights.

SHEATHING AND ROOFING. The car now passes along one more stage in its path, when the sheathing of the sides is attended to. This is a simple task, as the matched lumber is prepared to length and only requires to be nailed on. This is followed by the addition of end ladders, previously assembled on the side benches by a workman detailed for this specific purpose, followed by the end trussing and the mounting of the door and its fittings, the door having previously been made up in the wood working department and brought over in a completed state.

This is followed by the roofing, the first layer being an overlapping one of reinforced galvanized metal. This metal layer is supported on small strips resting on the stringers, and running from the ridge pole to the side plates as shown in fig. 11. Corrugations in the metal fit over these strips. Over top of this, the matched lumber for the roof is laid.

FINAL TOUCHES. Passing the car down one more step, most of the final touches to it are made. These include the additional parts shown in the car in fig. 12, such as the centre runway on the car roof, brake standard and its attachments, and the grab irons on the roof. On the lower level, there is a further gang adding the end deadwood, and tightening the centre truss rods on to it, piping the car for the air, putting on the steps, and the other minor details that go to make the completed car. The outside trimmings of the car near the roof are also added. This completes the car construction, and it is now ready for the finishing touches in the paint shop.

THE PAINT SHOP is at the extreme end of the erecting shop, through large corrugated fire doors. Here there is room for several cars in a row, where they are painted one after the other by means of the air brush. Needless to say, the air of this shop is a bright red from the atomized paint floating about in the atmosphere. But the job is performed very rapidly, and the resulting work is said to be superior to hand brush painting, as the paint is made to penetrate into the pores of the wood and into all the crevices that could not be reached by the brush. Each car receives three coatings, with a several hour period intervening between each coat that it might penetrate and dry.

The car thus painted is taken out into the yard, where the lettering and numbering is attended to with stencils in the usual manner. Without any special waiting after the car is thus numbered and painted, it is hauled away to make room for more, so rapid is the rate of production, even though the yard space at the disposal of the builders is quite large.

The capacity of each track per day is 10 cars under normal conditions, so a good idea of the rate at which the work progresses may be gathered. The steps in the work are so mechanical, and the methods involved so well planned, that the workmen are not pushed beyond normal working. To watch the gradual evolution of the car is, to say the least, a most interesting sight, and it is very instructive.

Fig. 9.—Raising Assembled Roof Frame.

Fig. 10.—Assembled Superstructure Framing.

Fig. 11.—Fitting on Galvanized Roofing.

Fig. 12.—Roof of Completed Car.

Profiles of Railways From the Atlantic Coast to the St. Lawrence and the Great Lakes.

Accompanying this article are five profiles of railways extending from the Atlantic coast to the St. Lawrence river and in one case to the great lakes. The small scale on which these profiles are drawn compels the omission of minor variations in grade, but the main characteristics of the lines are shown. Where rates of grades are marked on the profiles the rates are the maximum in the location marked, and not the average for the entire rise; in many cases, of course, this maximum exists for only a short distance. These profiles are of special interest in showing the comparative profiles of two or more lines between the same points.

In making such comparisons, however, it must be understood that the profiles do not afford a basis for criticism as to the relative excellence of the work done by the locating engineers, since different lines may pass through country of entirely different topographic characteristics. Even when located approximately in the same district, no direct criticism can be used on the profiles. One may be an old line built when low cost of construction was of much more importance than low grade operating conditions, while another may have been built at later date, when traffic was of such importance as to warrant high construction cost to obtain low grades.

In the following notes reference is made only to certain of the main characteristics, leaving the reader to study for himself the features of the several profiles as shown.

The Intercolonial Ry., fig. 1, extends from Halifax approximately along the coast line to Quebec and Montreal. The newer line of the National Transcontinental Ry., fig. 2, forms in part a cross country or chord line to the coast-line loop of the Intercolonial Ry. between Moncton and Quebec, and by thus crossing the ranges and the high land of the interior it reaches much higher elevations than the older line. The Intercolonial Ry. practically touches sea level at different points, including Levis, opposite Quebec, and has maximum grades of 1.1 to 1.3%. The National Transcontinental Ry. keeps high above sea level, and its maximum grades are 1.1%, with long grades of 0.4% against eastbound and 0.6% against westbound traffic. Near Quebec it maintains an elevation of approximately 150 ft. for crossing the St. Lawrence at the Quebec bridge. The maximum elevation is 1,200 ft. A considerable part of the line is in wild and unsettled country, and water tanks or water stations are located at intervals of about 15 miles. This line makes a saving, of 32.85 miles, or 4%, in distance, its length being 460.50 miles, as compared with 487.6 miles between the same points on the Intercolonial. This new road is under construction, but not yet in operation. It was located by the National Transcontinental Ry. Commission's engineers, and will form the eastern connection of the Grand Trunk Pacific Ry., by which company it is to be operated.

Fig. 3 shows the profile of the Grand Trunk Ry. from Portland to Montreal, and fig. 4 shows that of the approximately parallel route of the combined Boston and Maine and Central Vermont railways from Boston to Montreal. The former route, 298 miles, has practically a continuous ascent from the coast to the summit elevation of 1,350 ft., and then a continuous descent to the St. Lawrence. The latter route, 334 miles, has comparatively easy stretches at each end, while its middle or mountain section comprises two main summits, one a little over and the other a little under the 1,000 ft. elevation, or considerably below the summit elevation of the G.T.R. line. Central Vermont Ry. above Lake Champlain As a matter of interest we give the following list of elevations on the line of the

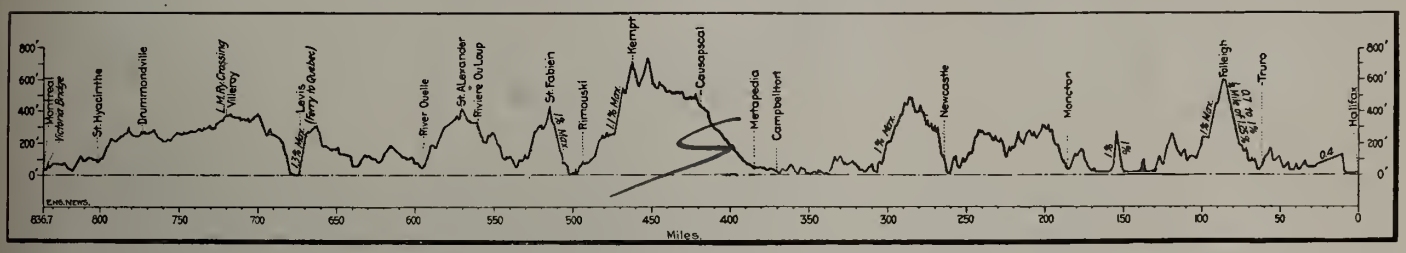


Fig. 1.—Intercolonial Ry.; Halifax to Quebec and Montreal.

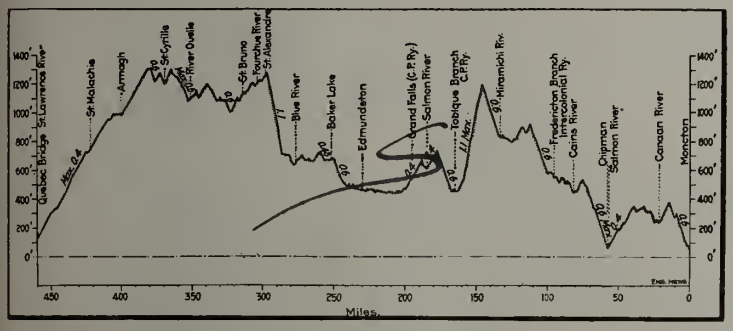


Fig. 2.—National Transcontinental Ry.; Moncton to Quebec.

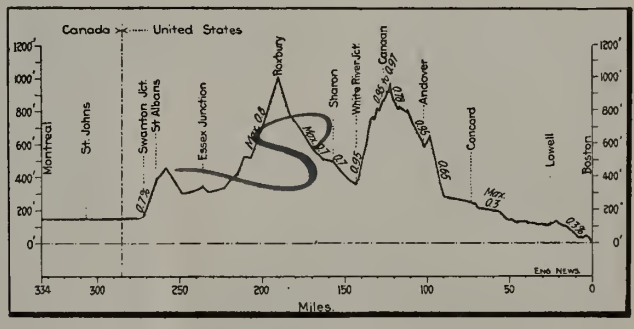


Fig. 4.—Boston & Maine Rd. and Central Vermont Ry.; Boston to Montreal.

	Lake Champlain, ft.	Sea level, ft.
White River Jct.	267.4	361.4
Sharon	406.0	500.0
Randolph	597.5	691.5
Roxbury	915.0	1,009.0
Montpelier	428.2	522.2
Essex Jct.	249.0	343.0
St. Albans	289.0	383.0
Swanton Jct.	60.0	154.0
Stanbridge	56.0	150.0

One of the profiles given above, between Buffalo, N.Y., and Chicago, Ill., fig. 5, shows

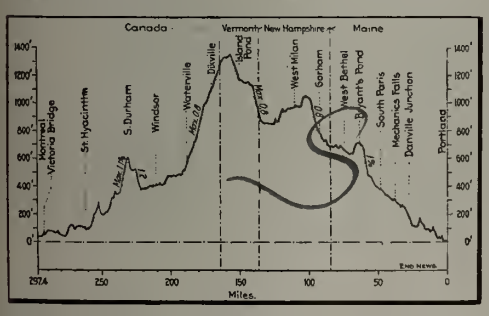


Fig. 3.—Grand Trunk Ry.; Portland to Montreal.

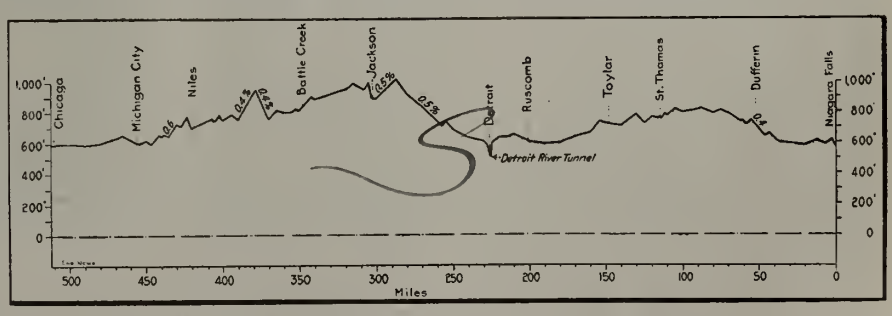


Fig. 5.—Michigan Central Rd.; Niagara Falls to Chicago.

the Michigan Central Railroad which runs through a portion of Ontario and Michigan. The sharp depression on this line, consequent on the utilization of the Detroit river tunnel, is overcome by the use of electric locomotives constructed so as to have sufficient power to haul standard trains over the consequent heavy grades.—Engineering News.

Removing and Repairing a Wrecked Timber Truss Span on the C. N. R.

The clearing of a wrecked timber truss span and erection of a temporary structure, restoring traffic, was accomplished a short time ago in three days on the Canadian Northern Ry. at Saskatoon, Sask., where a derailed car demolished the north shore span of the bridge over the South Saskatchewan river. This bridge consists of six 150 ft. through Howe truss spans of timber on concrete piers, the rail elevation being about 45 ft. above the surface of the water. The bridge was of British Columbia fir in first class condition. It was built about six years ago.

As one of the southbound through passenger trains, carrying several sleeping cars on its rear end, was pulling through the south end of the yard at the approach to the bridge on March 4, the rear truck of the last sleeper left the rails at a switch about 500 ft. north of the bridge. The truck slewed and led off on the switch to the west or right hand side until the wheels that should have been on the left hand rail were over a foot outside the right hand rail and beyond the guard timber. There was a 30 ft. approach trestle, but the wheels were hanging over the ends of the ties when this was reached, so the guard rails could have no effect. The sleeper was dragged in this position on to the bridge, sideswiping the truss and breaking or knocking out the posts and diagonals. This span collapsed completely, falling with the last car to the river bed below, which was almost dry and frozen to the bottom. The sleeper which went down is shown at B in the smaller of the two accompanying illustrations. The damage to the bridge did not extend beyond the first pier and the car preceding the one which wrecked the truss remained on the structure, having its rear badly damaged, however. Fifteen passengers were in the rear sleeper, and 12 were injured, but none fatally. A fire started in the wreckage, but was quickly put out by the city forces.

The wreckage of the truss and the car was cleared away with the aid of a Lidgerwood ballast unloader, which dragged it sideways off the bridge site. A track which runs west along the river bank at right angles to the bridge was utilized for this purpose, the Lidgerwood car being set at the point marked A on the photograph of the reconstruction.

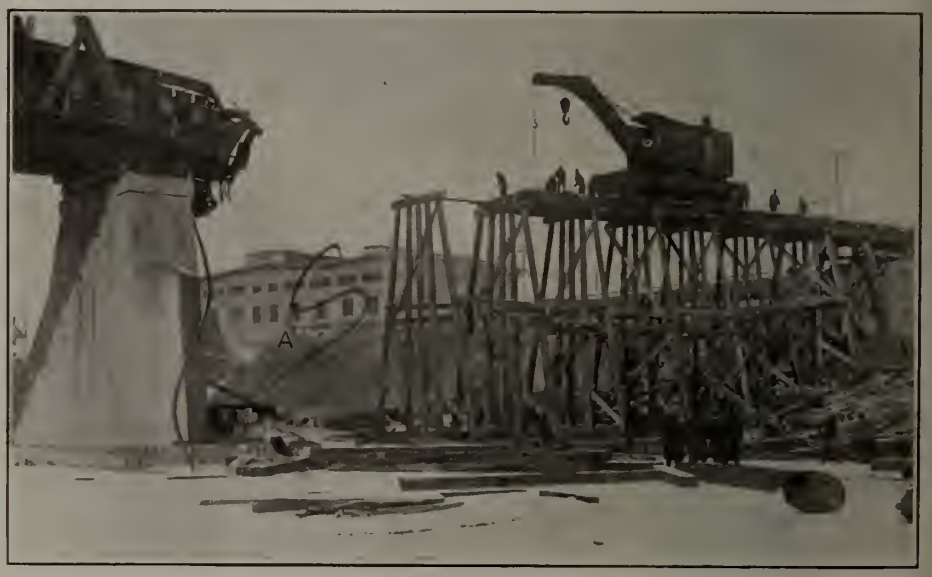
The cable was then run down to the wreckage, dragging the tangled mass of rods and timber and the wrecked sleeper out of the way.

Reconstruction was started by first erecting a temporary trestle over which traffic could be opened. Bents were framed on the ice and raised by a wrecking crane working outward from the shore end, blocking being put under the bents. On account of the end of the second sleeper overhanging the adjacent span, it was necessary to build entirely from the shore, so that the crane could be used to lift the overhanging car. The last two bents next to the pier were framed at the side of the bridge, then lifted clear and swung into place. When all but one panel of the trestle was decked, the crane lifted the end of the hanging car and pushed it forward on the undamaged part of the bridge.

With traffic thus restored, work was continued on the erection of the permanent Howe truss span, utilizing the trestle for falsework. Additional posts were placed vertically on the end of each sill to carry the weight of the new span.

The nature of this accident was such that it was believed to be unpreventable by the guard rails, and it is also believed that a steel structure would have suffered similarly.

Wreckage of the Timber Truss.



Method of Clearing and Re-erecting the Span.

Steam Railway Fatalities.—During July, 24 employes were killed and 34 were injured, in the course of their work in connection with the operation of Canadian steam railways. Of the fatalities, six were due to being run over, four each to collisions and to derailments, three to falls, two each to falling material, and to being crushed between cars, and one each to being drowned, to being struck by a train, and to being shot. Of the non-fatal accidents, nine were due to being struck by trains, cars and light engines, eight to being run over, seven to collisions, six to derailments, three to falling material, two to scalding, and one each to being burnt, and being caught between rail and crossing plank.

The report that Mackenzie, Mann & Co. had offered the Government $90,000 for Snake island, situated about three miles from Roche's point in Lake Simcoe, was denied by Sir Donald Mann, Sept. 4.

A Temporary Cement Wash Protection for Bridge Timbers.

A temporary fire protection for old timbers on a steel bridge where the length of useful service had nearly been reached and the wood badly checked was recently provided on the Boston & Maine Rd. by a wash made up of Portland cement, plaster of Paris and sand. The bridge was a deck structure, located at such a distance from the station or houses where attention might be attracted by a fire burning on it, that some form of protection was considered advisable during the period of one or two years remaining in the life of the ties. There were wide and deep cracks in some of these ties, and as sufficient experience had not yet been had at that point with the use of fire-resisting paints to give assurance of their effective service, experiments were made in filling the cracks with various compositions, and also covering the entire top surface of the ties and guard rail.

The first experiment was with cement and water alone, but this plaster cracked and came out of the cavities in the ties, so as to afford very little protection. A mixture of lime, cement and sand was then used on another portion of the bridge and was found to give better protection. Finally a mixture of cement, plaster of Paris and very fine sand was tried, this being mixed so thin that it would run in and fill all of the cracks in the ties and guard rails. It was washed over the entire surface of the timber.

This form of protection proved effective in stopping fires on the bridge for a number of months, but was considered only as a temporary expedient. The expense of the application was about the same as that for the application of a coating of fire-resisting paint, but the durability was considerably less than that of a paint. Since this work was done the fire-resisting paints have been investigated further and found to be sufficiently serviceable as a protection. They are believed to be preferable, where the protection is desired to last for any considerable period.

The experiments and observations in connection with the cement wash coatings outlined in the foregoing have been carried out under the direction of B. F. Pickering, Supervisor of Bridges and Buildings, Boston and Maine Railroad, at Salem, Mass.

Making Cattle Guards at the Grand Trunk Railway London Car Shops.

Under the direction of Geo. Powe, Foreman Woodworking Department, G.T.R. car shops, London, Ont., a series of jigs for the rapid machining and assembling of the component members of a G.T.R. standard cattle guard, has been developed, and will be illustrated and described herewith. A standard cattle guard of the narrowest size is shown in fig. 1. These guards are made in three sizes. The two commoner sizes are those which fit in between the two rails and the mating ones for each side of a single track line. The third is the one used between the inner pair of tracks on a double track line. Large numbers of all sizes are made up at London, as that is the central point of a large mileage of both single and double track.

Fig. 1.—Standard Narrow Size G.T.R. Cattle Guard.

Fig. 2.—Edging Top of Cattle Guard Bars.

The first operation, illustrated in fig. 2, is that of edging the bars. The stock is placed in piles alongside of a rip saw, as shown in the right background in this illustration. On the rip saw table, to the left of the saw, there is secured a guide block, into which the base of the bar fits, tilting the bar over into the path of the saw an amount sufficient to give the required bevel. The bar is kept over to the saw by the outer edge of the bar being guided on the guide block. The operator on the far end pushes the bar half-way through its cut, when it is seized by an assistant at the near end and drawn through the balance of the cut. The guide is so set as to cause the saw to cut through half the width of the bar. The half-cut bar is returned along the surface of the table, on the left side, where it is again seized by the first operator and passed through as in the first cut, completing that portion of the machining. It may be noted in passing that, on the far side of the saw, there is a vertical board clamped to the table at an angle to the saw, for the purpose of diverting off the table the wedge-shaped pieces that are scrapped by the saw. Otherwise, the saw might pick up these pieces and hurl them back at the operator, with injurious results.

After the passage of a batch through this last operation, the saw is fitted up for the second or end bevelling operation. The machine as set up for this is shown in fig. 3. On the surface of the table, there is a small piece of board, tongued on the lower side to fit the groove of the table, along which it is guided. A counterweight, slung over the end of the table on a pulley attached thereto for the purpose, is attached to the rear end of the guide board to balance the weight of these moving parts and relieve the operator of much of the arduous part of the work. At the proper angle on the top of the guide board, there is nailed a locating strip, against which the bevel of the bar is held while the cut is being taken. The operator takes the cut to the depth of the top bevelling, reverses the bar and repeats on the opposite end. No assistant is required in this part of the work. To the right of the saw, it will be noticed that there is a saw guard to prevent the saw lifting the severed part and throwing it back towards the operator.

The bar has next to be drilled to receive the three binding bolts. A horizontal drilling machine, rigged as in fig. 4, is employed for this operation. Secured to the drilling machine table, and at right angles to the drill spindle in the horizontal plane, there is an extension to support the bar while drilling and at the same time to locate the holes. This extension has a rear edge which guides the board and against which the operator keeps the bar pressed while machining. Hinged to this rear edge are three hinged stops (the one to the right not shown), against which the bars are held to locate the holes. In the illustration, the bar is held along against the first stop while the operator is pulling the drill through from the rear. When this hole is drilled, the first hinged stop is swung up out of the way and the bar shoved along to the next or central stop, and the second hole drilled. This stop is then swung up out of the way and the bar located against the third and last hole. The holes in the bar are thus located exactly equidistant to each other, insuring against the holes not lining up properly in the final assembling. This drilling is quickly performed by a dextrous operator.

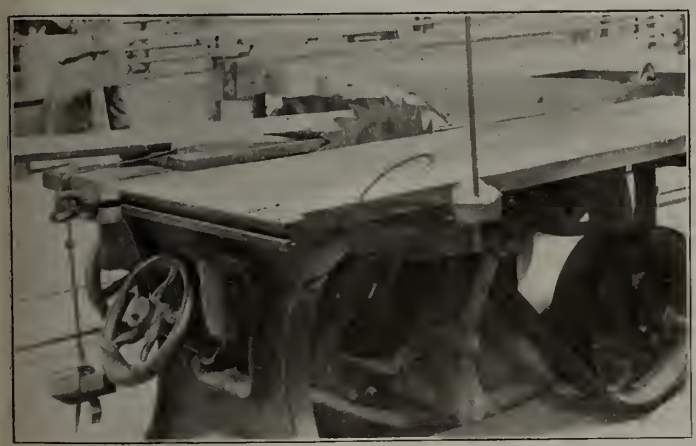


Fig. 3.—Bevelling Ends of Cattle Guard Bars.

Fig. 4.—Drilling Bolt Holes in Cattle Guard Bars.

Next in order comes the drilling of the separating blocks, through which the clamping bolts pass. This operation is performed in the same drilling machine as the drilling of the bars, the separators having been cut off to length previously. These pieces, being small, permit of rapid handling, and in consequence a quicker method of using the machine than that employed in the previous instance is desirable. Carrying the work towards the drill, instead of the drill towards the work, seemed the best method

of accomplishing this, and the method of so doing is shown in the accompanying illustration, fig. 5. Clamped to the top of the drill table, there is a section of board covering the whole table top, and extending over the sides. The front of the board is lined up against the front edge of the table. On this board, there is a sliding wooden table, guided on the under part by a tongue fitting the groove of the latter, this tongue and groove being in line with the drill spindle. The separators are located on this movable platen up against the forward edge, located endwise against the pin shown. The drill spindle is located permanently in position, and the holes drilled by the operator forcing the upper carrying table towards the drill. Rapid operation is thus made possible, more so than if the drill spindle were moved up to the work.

Bevelling the edges is the next operation on the separating blocks, the rip saw being set up as in fig. 6 for this purpose. Parallel to the saw on the saw table, there is clamped a long board carrying a tongued upper surface, on which a carriage over top, with a grooved lower surface, is guided. In a recess on the upper surface of the carriage, the separator is located, and the carriage with contained separator run past the saw, trimming off the corner.

Piece Work System at the Grand Trunk Railway Port Huron Shops.

Under the supervision of J. L. Hodgson, Master Car Builder, G.T.R. shops, Port Huron, Mich., a system of handling piece work has been developed that has proved a very valuable asset. In these shops, everybody but the office staff works on piece work, prices having been set for even the smallest operations, such for example as the painting of a couple of inches of stripping along the side of a passenger car, and similar small tasks. The management in this way knows exactly what the repair of a car will cost down to the last cent, and can therefore determine almost instantly whether it would be advisable to undertake the repairs at that particular time, or wait until they are more extensive, and require a more complete stripping of the car. Knowing the cost and the probable earnings of the workmen, the length of time required to put the repairs through is also known to within a very short space of time. The work can thus be scheduled through with a certainty of its being completed as promised.

A most important item is the fact that the workmen are more satisfied. Whereas a certain amount of money in it for them, and in consequence, it is to their advantage to complete the task in the shortest possible time compatible with good workmanship. The popularity of the scheme is evidenced by the fact that some little difficulty has been experienced in obtaining foremen in certain of the departments, from the fact that the more dextrous workmen can make as much or more than the foreman in charge of the work. The incentive naturally is to remain where there is the most money.

In the freight car department, the work is handled by tracks. That is to say, a bunch of cripples is run in on one of the shop tracks, and none of the cars are removed until the whole lot are again in operating condition. To each track, there are a given number of workmen, about two per car, apart from the trucks, which are handled separately. These men operate in pairs, as that has been found to be the means of working the men to the best advantage. The numbers of the cars entered for repairs are each written on a separate piece of paper, these several pieces of paper being then rolled up separately and mixed

Fig. 5.—Drilling Bolt Holes in Separators.

Fig. 6.—Bevelling Ends of Separators.

Reversing the position of the separator on the carriage, the other end is trimmed down. On the near side, it will be noticed that there is a bevel strip, secured to the guide board to the rear, for deflecting the severed pieces from the saw and preventing injuries to the operator.

The wooden parts entering into the construction of the cattle guard being thus far completed in the machining, the parts are all taken to the assembling stand, as in fig. 7. Bolts from the screw department are piled conveniently under the assembling stand, and the separating blocks, in recesses in the upper surface. Against the edge to the right, which has a retaining shoulder, the first bar is located and three clamping bolts passed through. Then, alternately slipping separators and bars on to the projecting bolts, the guard is gradually built up. It will be noticed that there is a guiding surface under the points where the three bolts come, facilitating the rapid assembly of the component parts.

The cattle guards, assembled as in fig. 1, are removed and placed in piles outside the door in the background for shipment as required. Large numbers of these guards are in constant demand as already mentioned, so that nearly all the time there is some one or other of the operations outlined being performed in the shop.

low wages are generally the rule where day work exists, from the general indifference shown by the workmen concerning the amount of time wasted on the task, under a piecework system the more the operator does, the bulkier is the pay envelope at the end of the week. This is probably one of the greatest incentives of a piecework system, if it is properly managed like the one under consideration, where the price is set permanently, and the workman has no fear hanging over his head that at some time if too great an amount is earned in a given interval, the price will be cut so as to reduce his earnings. Under such a scheme, the incentive to increase the output of the plant is removed, and the scheme is but slightly better than a day work system that is properly supervised. The greatest loss in such a case lies in the limited output from a given factory. The greater the output from a given factory, other things being equal, the less the standing charge per unit of production, and at the same time, the time when it will become necessary to extend the plant to handle increased business, will be pushed further into the future, involving the use of the capital that might otherwise be tied up, to other purposes. At these shops, no trouble has been experienced with the system, as no cutting exists. The men are given a fair price, and when they start in on a job, they know there is

together in a hat. The leader in each pair of men then draws one of these slips, representing the car on which that couple are to work. This method of distributing the work was made necessary by the fact that while the prices set for each of the different parts of the work have been set as fairly as is possible, some are found to be slightly better than others, and the more wily workmen would soon determine the best jobs, and on each occasion select that one, while probably the more plodding workman would have the poorer one shoved off on him.

As each track of cars is ready to be placed, an incoming inspector goes over each of the cars separately, noting all the repairs required on a special form provided for the purpose. For freight car bodies, this form is 13 x 14½ ins., divided into four main columns of items. At the top of the form, the schedule number, incoming inspector's name, road, class, number, and date commenced, and finally the date completed, are entered by this incoming inspector. In the four main columns of items, there are printed 178 parts, covering every kind of repair possible on the car. Opposite each item, there are three items giving number of pieces, rate and amount. In these columns, at the points required by the nature of the repairs that the inspector observes, the several amounts are filled in, duplicate forms being made out. The original goes

to the office, where it is retained by a chief piecework timekeeper under the supervision of the chief clerk, while the duplicate is handed to the leading workman, so that he may know what repairs are expected of him. At the end of the last item column, there is a space for the entry of the number of workmen on the car, check number, hours and amount. With this repair sheet before them, the workmen know exactly how much money there is in that car for them, and proceed accordingly.

Each pair of workmen operate independently of the others on the balance of the cars in the early part of the work. From the nature of things, some cars will require more extensive repairs than others, and will not be completed as soon as the ones requiring the light repairs. Therefore, the pairs from the light repair jobs, as they complete their tasks, are combined with others on the heavier repair tasks until that job is also finished. In that way, all the workmen are kept employed up to the completion of the final car, by a careful juggling around on the part of the foreman. The total cost of the car is pooled, and the different workmen paid in proportion to the number of hours each one has worked. Needless to say, there are no loafers under such a system, as the balance of the workmen see to it that each one does his proper share and works at the proper rate.

whole car run out into the yard. The final inspection was formerly made in the shop, before the body was lowered on the trucks, but as the car strains are different when in service conditions, it was found that bolts, etc., that had been indifferently tightened up in the shop, were loose in the yard. The workman now makes a point of having everything tight, so as to avoid having to make an extra, unpaid-for trip to the yard to finish a careless job.

Crooked work on the part of the men in turning in false statements of the work, is almost impossible, and requires the co-operation of at least five to make it possible—incoming inspector, two workmen, piece work inspector and the outgoing inspector—an almost impossible combination. The job as finally correct, is signed by the outgoing inspector, and the sheet returned to the office, where it can be compared with the original, and any changes detected.

The work in the passenger car department is handled somewhat differently from that in the freight car department from the very nature of the work. The work here cannot be pooled in the same way, as there are several classes of skilled labor at work at the same time on the car, whereas in the freight car, most of the labor is of a rough type.

The assistant foreman allocates the work to the various workmen, giving out slips

remarkable, and all are of the opinion that conditions are much improved to what they were formerly under the old day work system.

The amount of clerical work involved would at first sight appear to be rather heavy, especially when it is mentioned that for the passenger car painting alone, there are over 3,000 different prices, covering even the smallest detail of repair. The clerks become so thoroughly familiarized with the prices of the different operations that only one is required in each department, and he makes up all the entries and the memos to be given the men each day.

Matching Head Tool Setting Gauge at the Grand Trunk Railway London Shops.

In the saw setting department of the G.T.R. shops at London, Ont., there is a handy little gauge for the setting of the cutters of a planer or lumber matching machine. As shown in the accompanying illustration, it is set up for aligning the cutting tools required in the tonguing and grooving of the edges of matched lumber.

The device consists of a base casting, carrying an upright with a bearing through which projects on each side an arbor of the diameter of the matching machine

Fig. 7.—Assembling Parts of Cattle Guard.

Gauge for Setting Cutters in Matching Machine Head.

The order for the work from the incoming inspector can at the best only cover such repairs as are apparent before the car is stripped. On stripping, other defects frequently become apparent, and to have them added to the pay list, the workman makes out a separate list of these on a plain piece of paper, and has this signed by either the incoming inspector or the foreman, who must then make an inspection to see if these defects really exist. Unless such an extra slip is made out and signed by the proper authority, the workmen are not paid for this work. This course is taken so that there can be no danger of bunco work.

The workmen each night put in slips of the amount of work performed that day. The piecework inspector, with these slips, checks over the work to ascertain if that amount really has been completed, and on verification, proceeds to make out pay memos to the men, stating the amount earned the previous day. These are delivered to the men before 10 a.m. next day, so that each day, the men are kept advised of the previous day's work. This has been found to be a good incentive to keep them keen on improving past records.

The work as it progresses is checked by the outgoing inspector for quality, and to determine if all the repairs have been performed. The outgoing inspector makes the final inspection after the body of the car has been lowered on the trucks, and the

called "shins," on which the nature of the work is noted. The workman proceeds to perform the work outlined, and on the completion, has the assistant foreman inspect the job and initial the shin, which is then deposited in the piece work timekeeper's box, the assistant foreman then giving the workman another shin for further work. The assistant foreman is in reality an inspector, and distributor of work.

The shins, as they are collected by the piece work time clerk, have the information contained entered on a schedule sheet, one of which is made out for each car, stating the nature of the operation and the price, dimensions, etc., in the same manner as the original sheet used in the freight car department. Before this entry, the clerk measures up the work to ascertain if the amount noted has actually been completed. The entries from the various shins finally completing the car repairs, the schedule is signed by the foreman and passed on to the office. In this case, there is a similar chain through which the orders pass, as in the freight department, requiring a general conspiracy on the part of the various parties responsible in order to have any manipulation of the accounts. The individual amounts are so small as to make the incentive for crooked work of no account.

Briefly, the above outlines the system of piece work as applied to these car shops. The smooth operation throughout is most

spindle which carries the cutter head. On a projecting ledge to the front, there is a movable cross arm, the ends of which are located opposite the location of the cutter on the arbor. These ends are open to receive the gauging pieces used for setting the cutting tools.

A gauging piece made of wood is cut as closely as possible to the shape desired, the tongued part in one end and the grooved part in the other as in the piece in the right opening. The cutters for the matched lumber are three in number, at three equidistant points on the circumference, making nine cutters in all. These individual cutters are ground to shape previously to being brought to the setting machine. The gauging piece for the tongued side of the lumber is set in the right-hand opening, the correct distance in towards the centre to give the right diameter to the cutter. The sets of three blades for the tip of the matching and the two sides are then set to this wooden gauge, which has been clamped in position in the opening. The three sets are each in turn set to the same gauge by revolving around the arbor to each successive position. Each combined cutter will then cut to the same diameter. The reverse end of the gauge is entered in the other opening, and the other cutters set in a similar manner. The corresponding cutters are then both ready for application to the machine.

Railway Mechanical Methods and Devices.

Driving Wheel Brass Stand at the Grand Trunk Railway Stratford Shops.

In the G.T.R. shops at Stratford, Ont., there is in use a very convenient stand on which to place the driving wheel brasses while scraping them to a fit on the driving axle. The brass as it comes from the boring mill requires to be fitted to the axle in some cases, and may require lifting off the axle several times between these work-

Scraping Stand for Driving Wheel Brasses.

ings before a final good fit is attained. Lifting the brass off the axle each time, and placing in a convenient position for fitting, consumes time, and it is in the decreasing of the time consumed, and the ease of operation, that this stand excels.

In the vertical guiding sides of the brass as it rests on the axle, two lifting hooks are placed. These consist of a block of steel with a projecting trunnion bearing on one face, while on each of two opposite sides, there are pointed studs, which can be screwed out against the sides of the guiding ways of the brass, the trunnion bearing outward, forming a solid trunnion bearing on each side of the brass, all as shown in the accompanying illustration.

The fitting stand consists of a piece of plate bent upward at each end, and supported on a framework of wrought iron bars. The uppermost ends of the upturned edges of the plate, are cut out to the size of the lifting hook trunnions. The corners of the upturned ends of the plato are cut away to facilitate the workman's movements while scraping.

The brass on the axle is lifted by a swinging jib crane overhead, by means of the trunnions, and placed in a similar position on the stand, the legs downward. That is the normal position, from the fact that the greater weight being there holds them down. To hold the brass up the other way in the position shown in the illustration, there is an attachment to the other side of the supporting stand, consisting of a plate hinged half way down the side, which can be swung up, a bent end fitting into the guiding way on the side to the right as indicated. The brass is thus in a convenient position for scraping, and the stand itself makes a handy table for the mechanic's tools.

Double Axle Roller at the Central Vermont Railway Shops.

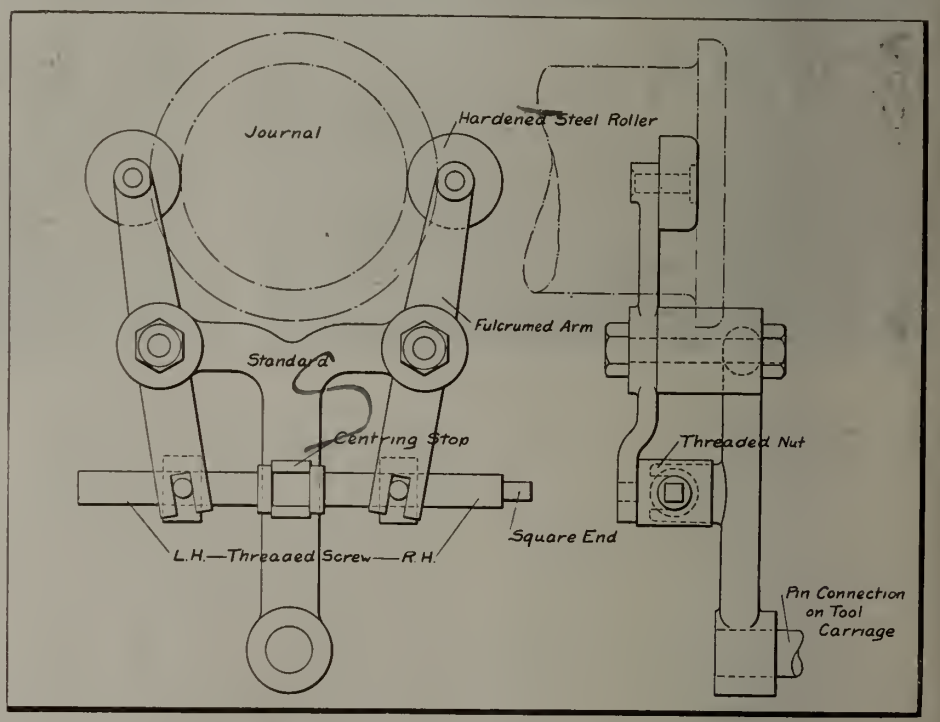
The practice of rolling the journals of car axles, on the completion of the machining in the lathe, is almost universally adopted for giving them a fine and smooth finish that will not be hard on the journal brasses nor entangle the waste in the journal box. In some few instances recently, special axle grinders have been employed for the purpose, and the results obtained have been most satisfactory. The tendency in all shops would seem to lead to the use of grinding wherever possible on bearing surfaces, yet at the same time, the older method of rolling seems to be so firmly entrenched as to be here to stay for some considerable time at least.

A marked improvement on the finishing tools of the single roller type is shown in the accompanying illustration. This is a double roller, so constructed as to equalize the springing tendency on one side as it exists in tools with a single roller. On a pin projecting from the side of the tool carriage, there is a vertical double arm standard, carrying at the outer end of each arm a fulcrumed arm. At the upper ends of the fulcrumed arms, there are hardened steel rollers, as in the usual construction. The lower ends of the fulcrumed arms are bifurcated to receive pins projecting from threaded nuts mounted on a right and left hand threaded screw, supported near the centre by a centering stop on the face of the vertical part of the standard. One end of this screw is squared for a socket wrench.

Normally, while the axle bearing is being turned in the lathe, the roller jaws are kept wide open by turning the threaded screw so as to have the threaded blocks close together near the centering stop. When they are required for service, the screw action is reversed, bringing the rollers up against the journal sufficiently tight to give the required rolling action to smooth down the rough surface. The two rollers bear equally on both sides, as it is self adjusting on the pin support from the lathe tool carriage. The rollers are also so mounted as to have the pressure on both sides come diametrically opposite to each other.

The big advantage in such an arrangement lies in the fact that the heavy rolling pressure is equalized on both sides. With the single-roller type, the resulting thrust on the journal is all in one direction across the bed of the lathe, the reaction on the centres, if the rolling is required to reduce a very rough surface, is quite high, with a consequent injurious effect on the lathe. With two rollers placed opposite each other, the reaction is removed from the lathe centres. The double rollers also tend to produce a better job than the single, for, with the latter, the axle is sprung an amount varying according to the distance the tool is from the lathe centre. Consequently, the journal portion tends to be tapered smaller at the end. The double rollers have no tendency to spring from the equalized action, so that if the original turning is parallel, the resulting rolled journal will be equally true.

This tool is used in the Central Vermont Ry. car shops at St. Albans, Vt.



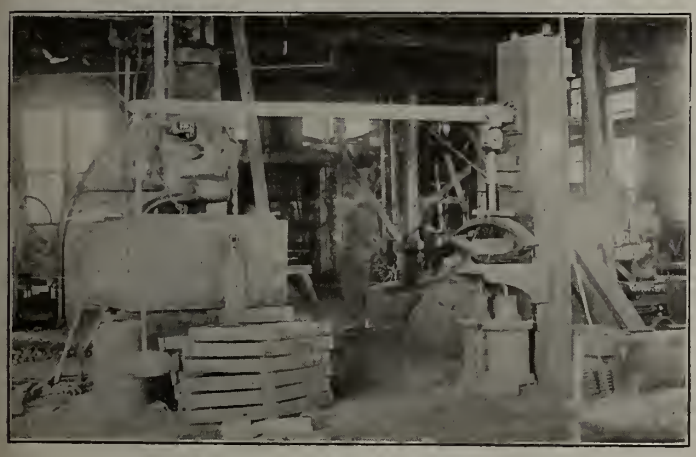
Double Axle Roller Designed to Equalize the Springing Tendeucy.

McDonald and Son, Toronto, who own a miniature railway at Scarboro beach park, Toronto, have requested the city council's permission to lay a miniature single track railway on Toronto island, from Hanlan's point to Centre island, for the carrying of passengers and light freight. The estimated cost is $25,000.

Spring Testing Machine at Grand Trunk Railway Port Huron Shops.

The accompanying illustration shows a spring testing machine as installed in the G.T.R. shops at Port Huron, Mich. Other machines of a similar construction are in use at other shops on the G.T.R., essentially the same as this one.

The whole device is carried on a heavy oak post, bedded in the ground in concrete, and is located in the blacksmith shop. Attached to the front of the post there is a lever projecting to the left front, pinned in the front of the post. A short distance out on this lever there is a short link connecting to a plunger guided in a casting on the front face of the post as indicated. At the base of the post are located a pair of air cylinders, the plungers of which operate upward on the under side of a table, which is free to rise, guided in ways on the face of the post. The lever at the top of the post projects several feet to the left, the outer end being supported by a loop from the roof beams. On the extreme outer end, a weight rod is suspended, for the carrying of weights in a manner similar to that on the usual weigh scales.



Spring Machine for Accurately Testing Capacities.

The spring to be tested is placed on the top of the rising table, and after placing introduced as in a well made scale. Fric- certain weights on the weight rod, the air is introduced into the cylinder, compressing the spring to a certain degree, and after the latter takes its final position, the weight lever rises. For each spring there are two capacities that it is required to know. The first is the light load opening of the spring, and the second, the full load opening of the spring. Between the springs on the table, it will be noticed that there is a wooden block, a gauge for the light load spring opening. The weights to correspond to the light weight are placed on the weight rod, and if the gauge block is still free between the springs when the cylinder lifts the weights, the spring has the required light load capacity. A similar course is followed with the full load capacity, a thinner block, the one on the table to the left of the spring in the illustration, is placed in the spring, and the corresponding weights loaded on the arm and the spring tested in this position.

The machine as at first made did not prove at all sensitive, as all the connections were pins. These produced a good deal of friction, which, when multiplied through the series of levers, became quite serious. In the arrangement as it stands now, this trouble has been eliminated, for at each of the pin connections knife edges have been tion is reduced to a negligible quantity, and the machine also made more sensitive, from the fact that the distance between points of support have become more positive from the use of knife edges.

Railway Bridge With Solid Plate Floor.

A standard broad gauge 100 ft. span deck girder bridge on the Bengal-Nagpur Railway, India, has two rivetted trusses 10½ ft. deep over all and 10 ft. apart on centres. They are connected just below the top chords by shallow floorbeams 10½ ft. apart carrying two lines of web-connected stringers 5½ ft. apart under the centres of the rails.

The top flanges of the rails and floorbeams are flush and are covered by a full-width continuous flat floor plate 5-16 in. thick rivetted on the longitudinal edges to the bottom flange angles of the top chords. In the axis of the bridge the floor plate is supported by a full-length line of 6 x 3 x ⅜ in. tee bars which at each panel between floorbeams has two 45 deg. bends at each end making kneebraces with vertical legs rivetted to the floorbeam webs. The tee rails in the track are spiked to wooden crossties resting on a 6 x 8 in. wooden longitudinal sleeper laid directly on the flat plates under the centre of each rail. The solid floor plate serves as a top lateral system, the bottom chords are X braced by horizontal angles between the sway bracing frames at floorbeam panel points.

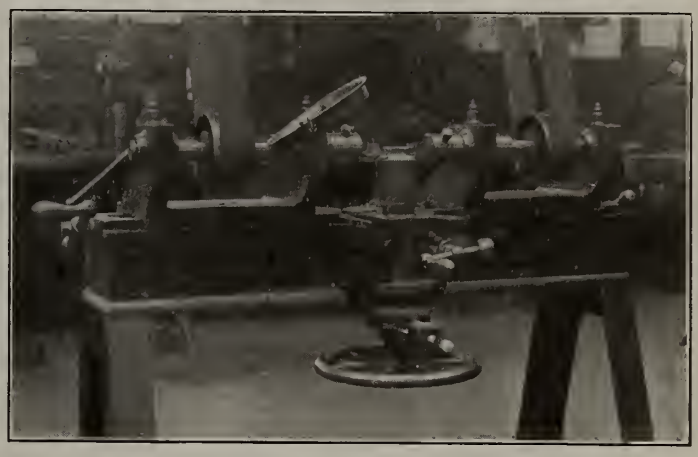
Milling Brass Nut Hexagons at Grand Trunk Railway Stratford Shops.

In the brass department of the G.T.R. Stratford, Ont., shops, there is a machine in use of a homemade design, originally designed at the Point St. Charles shops, Montreal, for milling the hexagon flats on brass nuts, performing the job two sides at a time in a very rapid manner.

As the accompanying illustration shows, the machine resembles a double ended lathe, the spindles being carried on heads that are moveable along the ways of the machine by means of the handles and adjusting screws on each end as indicated. In the chucks on the end of the spindles, are flat ended milling cutters, secured in the chuck with set screws. The flat ended milling cutters are made in the same manner as flat drills from bar stock, with the end flattened down, but not with the taper point. These cutters can be brought within any distance of each other to give the desired thickness across the flats of the nut.

The nut is screwed on the end of a corresponding screw mounted on the upper end of a stand on the cross slide corresponding to the tool post cross slide on the tool carriage of a lathe. This screw end is vertically adjustable through a screw passing up through the centre of the post, actuated by the handwheel at the bottom. Just above the handwheel there is an indexing device for turning the nut through the third of a circle at each move, and it is also possible with the same attachment to cut four and eight sides by indexing. With the hexagon, it is the practice to cut two sides with the index handle to the left, then in the centre, and finally on the right. The next nut has these steps reversed.

In the cutting, the cross slide carrying the nut is carried across through the cutters by the operator manipulating the handle in front, there being no cross feed. For the protection of the operator from the rapidly flying brass chips, the machine is provided in front with a gauge glass front, through which the operation can be observed without any danger to the eyes. This is shown swung out of the way in the off position.



Machine for Milling the Hexagons on Brass Nuts.

Superheater Switchers.—When the Lake Shore and Michigan Southern Ry. equipped a switching locomotive with a superheater in 1911, the experiment was expected by outside critics to prove a failure. Successful operation since that time has proved from test and observations on the part of the crews, that the saving in fuel and water amounts to 40%, which is greater than on road service. This reduces the time necessary to coal and water. The cylinder condensation is eliminated, removing the possibility, as in ordinary switchers, of water being thrown out of the stack, with injurious results to the clothing of bystanders. In addition, there is an almost entire absence of black smoke. Fires that formerly had to be cleaned every 12 hours, now need cleaning only half as often. Flue leakage has been materially reduced, and it is to be inferred that there will be a proportionately increased life to the boiler with decreased repairs.

Comparative Distances, Moncton to Quebec.—The distance on the National Transcontinental Ry. from Moncton, N.B., to the north end of the Quebec bridge is 460.45 miles, and the distance from Moncton to St. Jean Chrysostome, Que., south of Levis, where the N.T.R. crosses the Intercolonial Ry., is 454.75 miles. The distance from Moncton to this crossing over the Intercolonial Ry. is 487.6, or 32.85 more than by the N.T.R.

The Canadian Northern Prairie Lands Co., during July, sold 320 acres at an average of $15.25 an acre.

The Design and Construction of Locomotive Boilers.

Following is a continuation of the report of the American Railway Master Mechanics Association's standing committee's report on this subject, presented at the annual meeting in Atlantic City, N.J., recently, the first portion of the report having been published in Canadian Railway and Marine World for August:

ARCH TUBES.—Of the replies received, 15 members use 3 in. tubes, one member uses 2 in. tubes and one member uses 2¼ in. tubes. Five members do not use arch

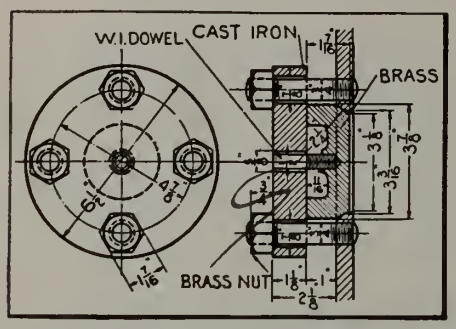


Fig. 16.—Arch Tube Hole Plate.

tubes at all. One member supports brick arches with studs fastened into the side sheet.

Thickness of tubes used: .15 in., .165 in., .18 in., .203 in., .25 in. Eight members use thickness of .18 in. Eleven members use seamless steel, one member uses charcoal iron, thickness of tube not given.

PLUGS OR PLATES FOR COVERING Arch Tube Holes in Throat Sheet and Back Head.—Twelve members use brass plugs, one member uses extra large size brass plugs for covering the holes; these plugs are drilled for 2¼ in. plug so as to avoid remov-

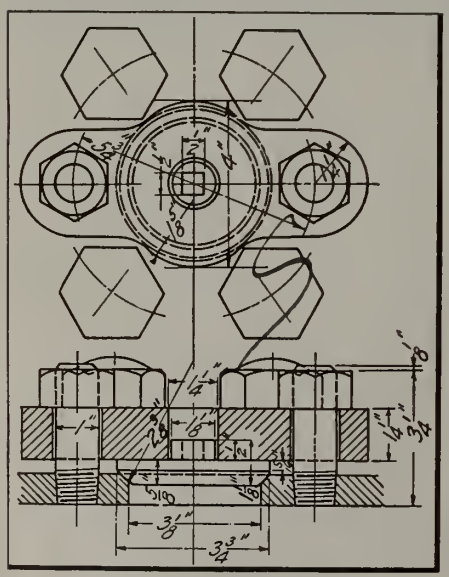


Fig. 17.—Arch Tube Hole Plate.

ing the large brass plugs when washing the tubes. Three members use plates with ball joints, as shown on figs. 16 and 17, claiming greater ease in removing and applying in close quarters.

THE SETTING OF ARCH TUBES varies. The replies received were indefinite as to just what practice they are following out. Six members did not state whether they use copper ferrules or not. Six members advise that they use copper ferrules. Three members set the arch tubes without ferrules. Three members set the tubes with a roller expander and a sectional expander to be used in the ordinary manner to set out the tube, as shown at A, fig. 18. Tubes are then beaded over with a bootleg tool, except by one member who bells out the tube on the water side to prevent the tube from pulling out of the sheet. This member does not use any ferrules. The other two members do use copper ferrules. Fig. 18 at B shows arch tube setting as used by one member.

For the information of the members you will find complete set of instructions for setting arch tubes, which is being used by several large roads with success. This covers tubes expanded and beaded on the outside as follows:

PREPARING HOLES IN FIREBOX Sheets.—Original holes in firebox sheet must be 3 3-32 in. in diameter. Worn holes must be reamed when more than 1-16 in. out of round. Sharp edges must be removed by slightly rounding with file or reamer.

in. thick seamless drawn steel. The tubes should be cut to proper length and bent to template conforming with drawings. The length can only be determined by actual measurement of the firebox and allowance

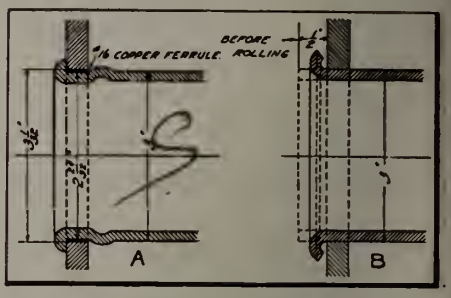


Fig. 18.—Two Methods of Setting Arch Tubes.

must be made for projection of ½ in. into water space at each end of firebox. Tubes must then be securely fastened with the roller expander. See A, fig. 19.

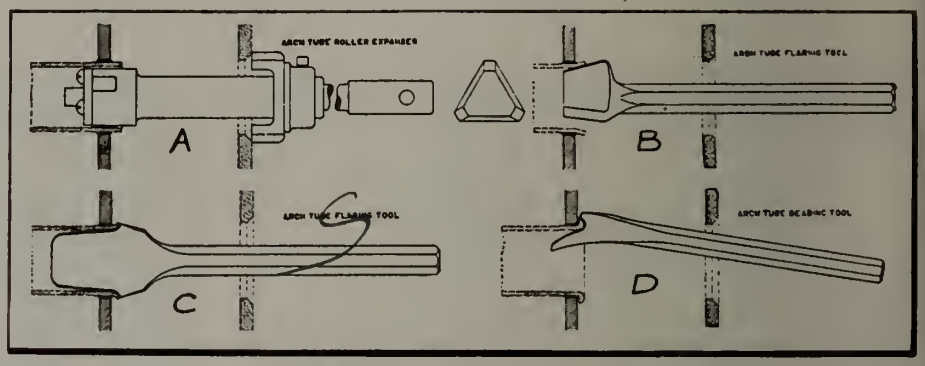


Fig. 19.—Different Tools for Beading Tube Ends.

APPLYING COPPER FERRULES.—Copper ferrules must be used at both ends of arch tubes. Ferrules should be 3 ins. outside diameter, .095 in. thick and ⅝ in. long, expanded by carefully hammering on a round mandrel to snugly fit the hole. Ferrules should be set with 1-16 in. projection on each side of sheet and secured in place with a roller expander.

PREPARING AND APPLYING TUBES. —Tubes must be 3 in. outside diameter, .18

FLARING TUBE ENDS.—After tubes have been set they must be flared at both ends with the flaring tools shown at B, fig. 19. After the tube ends have been thoroughly flared the tube ends are then ready for beading.

BEADING TUBE ENDS.—Additional flaring with tool shown at C, fig. 19, is necessary to start the bead. The bead must then be formed with special beading tool, fig. 19. Notice that it is not desired to

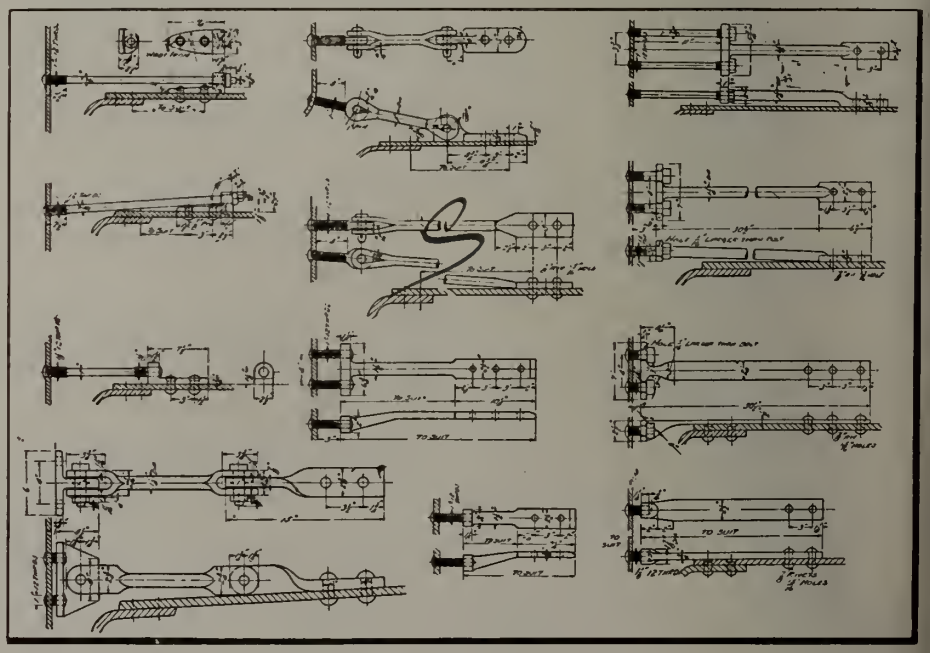


Fig. 20.—Twelve Styles of Throat Sheet Belly Brace.

form a full bead. The bottom of bead should stand 1-16 in. clear of the sheet.

MAINTENANCE OF ARCH TUBES.—Tubes should be thoroughly examined and cleaned at each washout of the boiler. At the least indication of scale formation in the tubes the pneumatic tube cleaner must be used. The tube cleaner is secured to a length of ½ in. air hose, to which is attached another ½ in. hose for supplying water while cleaning. Care must be taken so as not to break the cleaning cutters by

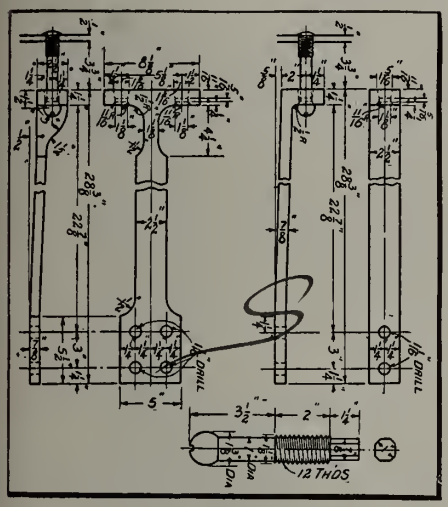


Fig. 21.—Two Methods of Throat Sheet Belly Brace.

allowing cleaner to be pushed through opposite end of tube. Stop must be provided on hose set at proper length for this purpose. Tube cleaner must be lubricated with signal oil fed through a lubricator in air supply pipe, 30 drops a minute. After cleaning, tubes must be inspected by holding a light at opposite end of tube to make sure that tubes are thoroughly cleaned and free from scale.

Leaky tubes must be stopped from leaking by rolling with expander, A, fig. 19. Before rolling tube ends must be thoroughly cleaned from scale.

Your committee has been unable to get any information in regard to which type of flue setting gives the best service, therefore are unable to make a recommendation as to which type we would recommend as standard practice.

RADIUS OF FLANGE IN BACK TUBE Sheet.—Replies received in regard to the radius in the back tube sheet where it connects to the crown sheets. Recommendations were made from ½ in. up to 2 ins. Some members had trouble with cracked sheets and leaky seams with large radius; others had trouble with the small radius. One member advises that he is now experimenting with a 4 in. radius and it seems to give good satisfaction, but it has not been in use a sufficient length of time to give a complete report. Two members increased the radius from ⅞ in. to 2 ins. and had considerable trouble with flue sheet working up and the flanges cracking. Two-inch radius has been discarded and they are now using ⅞ in., which improves the condition but does not eliminate the difficulty entirely.

DISTANCE FROM INSIDE OF FLANGE of Back Flue Sheet to Edge of Flue Holes.—Your committee recommends that the distance from the inside of the back flue sheet to the edge of the nearest flue hole be ample to prevent the flue sheet cracking through the flange. This distance will vary, depending on the radius of the flange of the tube sheet. In tube sheets with ⅞ in. radius, this distance should be at least 2 ins. at the top, ⅞ in. on the side. In sheets with 2 in. radius, the distance should be at least 2½ ins. at the top.

THROAT SHEET BRACE.—Your committee had the members submit designs of throat-sheet belly brace used and fig. 20 shows 12 styles of braces, the design of brace for this location to be such as to avoid any mud pockets and so as to allow for proper circulation of water.

METHOD OF SUPPORTING GRATE Side Frames.—Your committee recommends the grate side frames to be supported from studs in the mud ring or brackets fastened to the under side of the mud ring, the latter forming a pocket for the grate side frame to fit into.

SLOPING BACK HEADS are used by practically all of the members who replied to the circular. The slope varies from 8 to 20 degrees, making an average slope of 12 degrees. Sloping of back heads gives additional room in the cab, reduces the weight of the boiler and gives a maximum length of firebox, and still remains within a reasonable limit for hand firing.

STAYBOLTS.—Uniform spacing of all staybolts in all parts of the firebox is recommended by your committee. The majority of the members reported the use of button head crown stays for the six to nine centre rows of the crown sheet the entire length; two members use hammered heads for the first four or five rows from the flue sheet. The different forms of button heads are shown by fig. 22, on which you

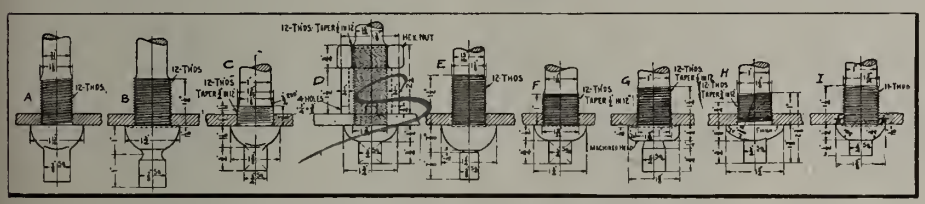


Fig. 22.—Different Styles of Buttonhead Staybolts.

will note that there are nine different designs shown. The member that uses style D advises that they are having some difficulty keeping the button heads tight.

Your committee favors the use of button heads on as many rows as the design of firebox will permit, but recommends for the consideration of members the practice of using hammered heads on the first four or five rows back from the flue sheet.

SLING STAYS.—Figs. 23 and 24 show the various types of sling stays in use by the different members and no difficulty with any of these types has been reported. Three members use a special flexible staybolt on all new equipment, as shown by fig. 25, and the use of this type of sling stay is also favored by, but not used by, another member. Sling stays are used to the extent of two, three and four rows back

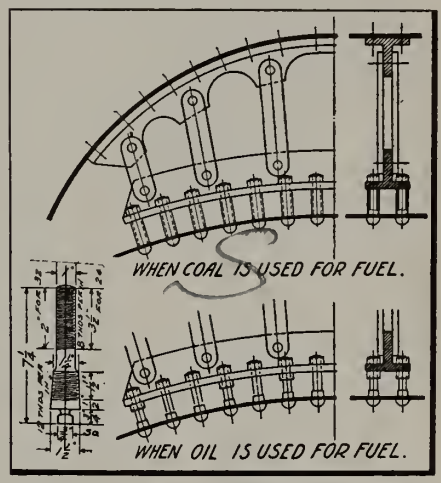


Fig. 24.—Two Types of Sling Stays.

from the tube sheet on boiler with combustion chamber.

FLEXIBLE STAYBOLTS.—Of the members who have replied, all except one member use flexible staybolts. Most of the members apply these in the breakage zone. Five members are making full installation of flexible staybolts on boilers with wide fireboxes. One member reports: "In Feb., 1907, locomotive received new firebox with full installation of flexible staybolts, with the exception of 4 bolts under the auxiliary dome and 4 under the steam turret; also 8 which go on top of same at back head. Feb., 1908, the locomotive received general repairs and firebox was in good condition. All caps were removed from flexible staybolts and they were found to be o.k. April, 1909, it was found necessary to patch the top of the back tube sheet on account of sheet cracking from the hole around the flange; this was done in the engine house. Oct., 1909, locomotive was given general repairs, and by this time the top of back tube sheet had given out in two more places, but as the sheet was in good condition otherwise it was patched. Three of the mudring corners also had to have small patches applied. After rattling scale from firebox sheets with large hammer, it was found that 40 of the flexible

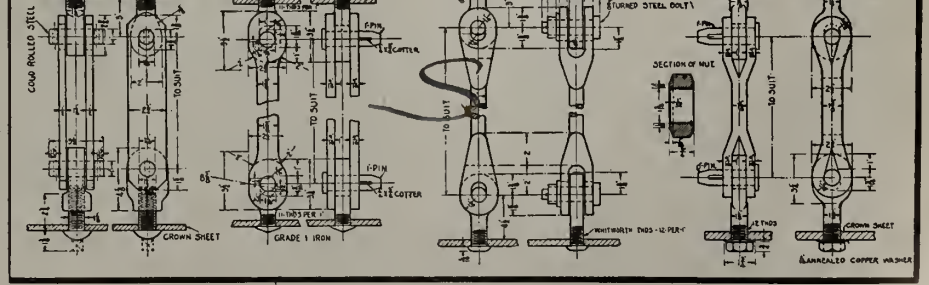


Fig. 23.—Four Types of Sling Stays.

sleeves had cracked outside of the sheet, and on being taken out they were found to be crystallized, but no broken bolts were found. In 1911 the locomotive was again in the shop for general repairs and had all

caps removed from flexible staybolts and bolts found to be o.k. A patch was applied on top flange of flue sheet, half side sheet seam in firebox in good condition. When locomotive is shopped again it will be necessary to renew back flue sheet on account of same being patched. This locomotive

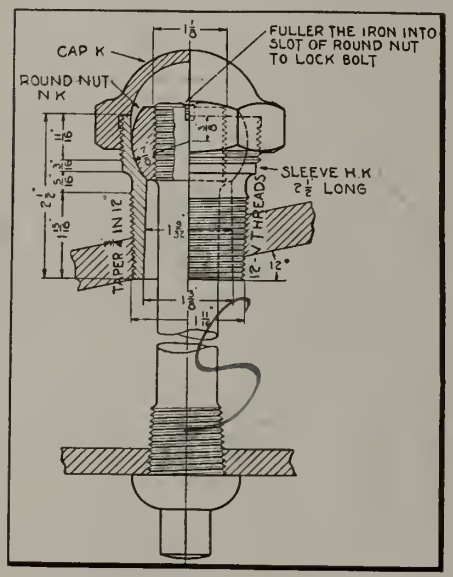


Fig. 25.—Flexible Staybolt Sling Stay.

made 319,567 miles to Nov., 1911, and lost no time due to broken staybolts."

One member advises that they have equipped some fireboxes with full installation of flexible staybolts, but can see no advantage in doing this. In their opinion the flexible staybolts are only advantageous when applied in the breakage zone, and they have discontinued making full installation and are only applying them in the breakage zone. However, a full installation of flexible staybolts in the throat sheet is being used by quite a few members with good results.

Three members advise that they allow a certain amount of slack when applying flexible staybolts. Fig. 26 shows the amount of slack and the location followed out by one of the members. It is the belief that an application of this kind will decrease the number of broken staybolts and allow for a greater expansion and contraction, which prevents the cracking of firebox sheets and increases the life of firebox correspondingly.

Your committee believes that this is a subject worthy of further consideration and would suggest that some more of the members carry on a further investigation and make a report at some future date to this Association.

(To be continued.)

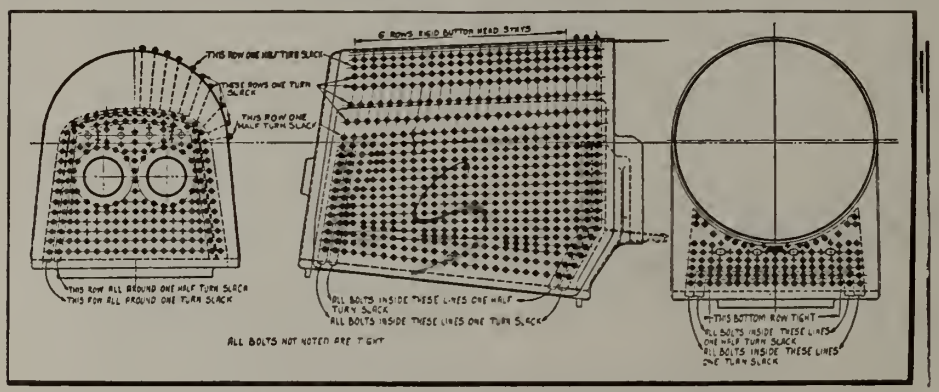


Fig. 26.—Slack Allowances and Location of Staybolts.

Suggestions and Deductions From Steel Passenger Cars.

By A. Copony, Chief Draughtsman, Car Department, G. T. R., Montreal.

It has always been the aim of railways to redesign and improve on existing passenger equipment, thus being in a position to take care of the ever increasing demands for safety, speed, and comfort of the travelling public whose wishes are becoming imperative in those sections of the country where competition amongst rival lines puts zest into the fight for supremacy in the passenger transportation business.

Several eastern and middle western roads have tried to keep up competition by means of increased speeds of trains run under a provisional guarantee, granting a refund of part of the fare in case trains are not run on time, whereas western and transcontinental lines, not able to perceptibly reduce their time of travel, on account of single tracks, are keeping up their bid for passenger traffic by means of safer cars, greater luxuries, and increased comforts, all of which items amount to astounding sums of expenses as well as profits to the railroads in question.

Since the advent of steel passenger cars the question of speed, comfort and safety has become more accentuated and the construction of these cars has become a matter of great importance, not only of the car department but of the motive power, the transportation and the maintenance of way departments, and the public in general as well, besides which there is a rational limit set to the expenses incurred for equipment, by the definite returns expected from this investment.

In order to show the interest evinced in certain performances of the cars by the different departments of railroads the following diagram will be of value in the more explicit treatment of details. The departments are indicated by following abbreviations set next to the details in question. [Editor's Note:—Owing to want of space the diagram has to be omitted.]

Car department		C
Motive power department		M
Transportation department		T
Maintenance of way department		W
Public		P
C	Construction.	
C	Constructional details.	
C	Maintenance	Protection against oxydization. Repairs.
C	Cost.	
C-M-W	Weight.	
C-M-W	Draft resistance.	
C-T-P	Insulation.	
C-T-P	Inside finish.	
C-T-P-M	Heating.	
C-T-P	Lighting.	
C-T-P	Ventilation.	
C-T-P	Sanitation.	

In the construction of steel passenger cars all the aforementioned points have to be carefully considered, besides which a host of other details have to be taken into consideration which depend on existing conditions under which a road is operating. For instance: It will be easier to build steel passenger cars operating in climates where the maximum and minimum temperatures of a year do not go to extremes, since the matter of insulation will not be so serious as in northern latitudes where the extremes are within a range of 120° or more. Cars operating in a climate of great humidity will have to be treated differently in the selection of material as well as painting; compared to cars operating in a climate of low humidity. Cars operating in mountainous sections with small curves and heavy grades will receive closer attention as to running gear than cars operating in international or transcontinental service where the percentage of total run to run under the above mentioned conditions will be comparatively small.

In order to demonstrate the merits and demerits of constructions of different types, it should be only fair to judge a car not only in regard to the dead weight per passenger seated, but the consideration of comfort and safety must not be omitted, and last, but not least, the cost and maintenance as well as draft resistance per car is of vital importance, if not to the passenger, decidedly so to the railway.

Not taking steel underframe cars with wooden superstructure into consideration and omitting the type of inside finish, we can split existing constructions into two different types, as follows: The double deck or monitor type and the single deck or turtle back car type.

THE DOUBLE DECK CAR TYPE.

This type follows in its main outlines the wooden car construction closely and has been adopted by the Pennsylvania, the New York Central, the Wabash, and the Delaware, Lackawanna & Western railroads, the Pullman Co., etc.

It consists in the main of a steel underframe composed of centre and side sills, intermediate sill being in most cases dispensed with and substituted by pressed or structural steel bridging. The centre sills are either of the fishbelly type built up of structural steel, or else consisting of heavy channels or I beams, as used by the Pennsylvania, the side sills are Z bar channel or I beams, or simple combinations of the aforementioned sections, the whole being well braced and connected with substantial steel-bolster castings, pressed or cast steel end sills and built up platforms, or designed to fit into the commonwealth type of end-framing casting, which is a combination of platform and bolster cast in one piece.

The superstructure consists of post of pressed steel or structural shapes, connected direct to the side sills, as well as indirect by means of the side sheets to the side sills. In some designs side plates are used for the top connection of the posts, but the Pennsylvania and the Pullman standard type of sleeping cars shows posts which connect in a clean sweep with the upper deck sills, thus eliminating lower deck carlins and side plates. In the first mentioned case either single, pressed steel, lower and upper deck carlins are used, but a number of constructions shows a combination of lower and upper deck carlins with deck posts, the whole being either pressed or of built up construction and applied while erecting the

framing of the car. The Pullman standard design and Pennsylvania standard of upper deck is built up on the floor as a unit and consist of pressed deck sill, upper deck carlins, posts, roofsheets, deck plates of pressed or rolled stock, the whole being applied to the posts after the lower framing is up. Side sheets, roof sheets, letter board plates, etc., are made of spliced sheets, or in one piece where convenient, the older constructions showing splices at posts with invisible joints and countersunk rivets, which have been found rather expensive in construction and weak as far as countersunk rivets in thin plates are concerned.

The permissible combined stresses for this framing, considering weight, load, and end shocks, the latter varying from 300,000 to 500,000 lbs., are usually taken within the range of 15,000 to 18,000 lbs. per square inch, but the weight of the car depends to a great extent on the selection of carrying members of the car, some designers preferring to build an underframe of which the carrying members are contained in the underframe only, as side sills and centre sills, thus keeping the centre of gravity of the carrying section within a small distance from the point where combined buffing shocks resulting from drawbar and buffing device are received.

Other designers take the construction of side plates, side sheets, belt rails and deckplates as carrying members of the cars into consideration and brace the sheets where necessary to prevent buckling. This construction has the advantage of permitting the use of a comparatively light underframe, but the centre of gravity of the whole section is thereby raised and larger bending moments resulting from buffing shocks are encountered, caused by the larger distance of centre of gravity from the centre of buffing shocks.

Roofsheets have, to my knowledge, not been considered for carrying members of this type of car, most probably on account of the comparative thinness of sheets and the minimum resistance to shear attained in the small sized rivets used for roof sheet connections, further on account of the complicated form of roof in general, although no buckling of sheets could be feared, since they are curved to fit the outline of the roof and stiff enough in most cases to resist compression stresses at the centre of the car.

The end framing of the cars is in most cases built up of heavy rolled sections, which are invariably stronger than the present day reinforced end framing of wooden cars, in order to prevent telescoping, some of the designers even using heavy platform posts back of the diaphragm as well, thus securing a double barrier against telescoping. There is no definite data as yet which would give a safe practical resistance to prevent telescoping, with the exception of the assumption of sections by the U. S. Postoffice Department, these being of a section modulus of 65 at a height of 18 ins. above the floor level.

Omitting the advantages of steel cars over wooden cars entirely there are many points which point in favor to the double deck car. The main consideration of most of the railways that has led to the adoption of the double deck steel passenger cars was their general outline, which follows the old type wooden car, so that the general appearance of a train when made up of wooden and steel cars will not be spoiled. The travelling public, used to this deck construction, looks with favor upon the inadequate but visible ventilating device maintained through the decksash opening, and overlooks the more efficient but less noticable ventilators applied to cars.

In sleeping cars the insufficient light entering the car through the deck sash is the only light besides artificial light that supplies the wants of an upper berth traveller for his early morning gymnastics called "dressing."

Not very much will be said in this place of disadvantages of the double deck type of steel passenger cars, since a comparison with the single deck type of car is inevitable.

THE SINGLE DECK TYPE.

The single deck car underframe is built up in a similar way to the underframe of double deck cars, but it is a very rare case, indeed, that calls for a fishbelly type of centre sills, a medium sized rolled shape being found to answer the purposes of construction in every way.

The superstructure up to the side plate above the posts, is the same as used with the double deck cars. A carlin connects the two side plates in a single sweep, and is in most cases made of pressed steel. The roof sheets are applied direct to the carlin, but it is quite a common practice to use tar paper at the spliced joints in order to get a water-tight connection between roof sheets. The application of tar paper for joints ought to be abandoned where roof sheets are carrying members of the car, since it is impossible to get and maintain an absolutely stiff joint in such places with this practice. The roof sheets are usually made heavier than in the double deck car type since a certain amount of deterioration is taken into consideration, so that after a series of years of oxidization the sheets are still strong enough to stand the strains they are subjected to. The carrying members of the car are as follows: The centre sills, side sills, side sheets, belt rails (if used in this construction) side plates and roof sheets.

A RAILWAY MANAGER'S TRIBUTE TO THE VALUE OF ADVERTISING.

Advertising solicitors are frequently told by manufacturers and others that railway men do not read advertisements but merely look at the reading matter pages. We have abundant evidence to the contrary, and give the following letter as an example of it:

International Railway of New Brunswick,
Campbellton, N.B., August 24, 1912.
The Publishers,
Canadian Railway and Marine World,
Toronto, Ont.

Gentlemen,

I have been a constant reader of Canadian Railway and Marine World for a number of years and wish to say that I appreciate it very much on account of the valuable information it contains, and the fact that its reading matter is so invariably correct.

Its advertising pages are also of great interest and value, and I find the Purchasing Agents' Guide, which you publish in each issue, particularly useful, and frequently refer to it for the names of manufacturers, etc., of various railway supplies.

Yours truly,
E. H. Anderson, Manager.

The centre of gravity of the carrying section of the car is naturally higher than in a double deck type, and the buffing shock lever is naturally larger, but it is in almost every case possible to have a carrying cross section weighing less per lineal foot than in a double deck type of car, since the tension and compression members are spaced a larger distance apart.

I do not know of a case where a steel platform casting has been used in this construction, since it has always been the aim of the designers to reduce the weight of this type of car as much as possible.

Fibre stresses and buffing shocks are kept within the same limits as mentioned for double deck cars.

The advantages of this type of car over the double deck type of car are numerous. First of all the single roof construction, with slightly increased thickness of sheets and a deeper curvature of roof, permits the use of the roof sheets for carrying purposes, which also permits cutting down of the side plate since a heavy side plate would not increase the section modulus of the car materially. There is no need of a special bracing of the roof sheets, because the large curvature of the roof effectively prevents buckling of sheets. I would advocate in this type of car the omission of side plate and carlins entirely and have the posts pressed in such a manner that they would substitute the carlins, this means an extension of posts same as used on lower deck of Pullman standard sleeping car, opposite posts being joined at the apex of roof by means of a splice plate and covered with the roof sheets in the conventional way. It will be harder to press these posts, but incidentally the omission of side plates and carlins means a reduction in weight and labor, both of which facts mean a cheaper car, and, furthermore, an easy regulation of width of car over posts, which is found difficult to maintain in pressed carlins, as they are very liable to warp after pressing and while cooling, thus changing the width of car unless the carlins are repressed cold in a close fitting die, which process is expensive and therefore to be avoided.

The air volume contained in single deck cars, compared to the air volume of double deck cars of the same length, is larger, at the same time the outside cooling surface of the single deck car compared to that of the double deck car is smaller, the body construction (labor and material) is cheaper than the double deck type; this can also be said of the total cost of inside finish. There are not as many bends and joints to be made when applying insulating material, which is a very important item for the successful insulation of cars. The head room of the car is generally higher in the turtle back type.

As these cars cannot be ventilated by the use of a deck sash more efficient ventilators are applied, which are either working in conjunction with the lighting fixtures or applied separately, as is the practice of the Harriman lines.

The reduction of light caused by the elimination of the upper deck sash is a matter that might be taken as a drawback, but if one takes the amount of subdued light filtering through the old type art glass deck sash into consideration coupled with the amount of soot and dirt received through the same source, this advantage is turned to a decided disadvantage. In case the turtle back car should be used for a sleeping car design, the lack of light from the deck sash could be easily remedied by the application of skylights, consisting of a cast oblong concave glass let into the roof in the centre of the car, placed so that the convex side of the glass will project above the level of the roof, which will give the collecting soot and dust a chance to be blown off the smooth surface of the glass by the action of wind and rain.

A turtle back car would, on the other hand, provide decidedly more space for headroom in the lower as well as upper berth, since the roof starts up at the posts with an abrupt rise, giving about 8 to 10 ins. more total headroom at the centreline of berth than a double deck car, which would mean an increase in headroom of from 4 to 5 ins. per berth.

Despite the increased headroom and air volume per passenger, the turtle back car is easier to be heated, since there is no draft through deck sash, permitting heated air to escape when the ventilators

are closed and further the slightly decreased total roof surface should be a great factor in keeping the car warm on a smaller steam or fuel allowance than permitted for double deck cars.

CONSTRUCTIONAL DETAILS.

Constructional details are matters that should take the whole attention of the car department of the railway and that of the contractor. The simpler details are worked out the easier it will be to replace them when in service, and although I am a firm believer in pressed pieces for car construction, I will concede that it is easier to replace standard angles or shapes than to replace the former.

The use of windows of different height and size in one type of car, as well as the use of half elliptic deck sash of art glass above the window, are features that I think objectionable from the purchaser's standpoint, since it is necessary to shape the outside steel sheets as well as the inside finish in many cases to the shape of this half elliptic sash, which is an expensive job when executed in a repair shop without the aid of dies or presses. The different sizes of windows mean a larger number and more frequent change of dies in the contract shop, which operation takes time and money, on account of the greater number of templets and dies used and the work connected with these changes, the bill of which must be footed by the purchaser, without gaining any visible advantage excepting perhaps the rather doubtful pleasure of keeping a larger number of window panes or sash in stock to suit the different sizes of windows, since the saving in glass caused by different construction is a negligible quantity.

It is, however, erroneous to suppose that it is necessary to employ large hydraulic machinery, big squaring shears or multiple punches to do the repair work, as I have seen shops that built cars commercially successful without any of the heavier type of machinery used in freight car construction.

In regard to the means of permanent connection of several units in steel passenger car construction, we have at present only two methods that are to be mentioned here and these are rivetting and spot welding. The former, most commonly used, is a source of a great deal of trouble and expense in the erection of the cars, since it means a lot of preparatory work before a rivet can be driven. All material must be centre-punched, marked, punched to different rivet sizes, which causes in many cases renandling of material on different machines, or resetting of single machines, assembling, reaming, and rivetting. Rivet holes never meet as perfectly as the drawings show them to meet, and the only means of getting the holes right is to punch them smaller and ream them to size afterwards when assembled. This is very expensive as to labor, and there is no assurance that the rivet will fill the hole after being driven. I have seen rivets driven in holes that were about ⅜ in. too large, so that the hole was covered up by the rim of the rivet instead of being filled by the rivet shaft, but I must not forget to state that this was on freight car work.

Spot welding, though at present only out of the experimental stage, promises to eliminate all this trouble. Sheets and pressings are trimmed to size, placed in jigs, representing side or end of car and welded up with a specially designed spot welding machine. These welds will stand about 30% more in shear compared to a rivet of the same size in a punched hole, and the whole structure will be stiffer than a rivetted structure of the same design, since there is no surplus space in a rivet hole that would permit the sheet to shift when under stress. These facts have been partly proven by personal experiments while connected with the American Car and Foundry Co., and further by those conducted by Chief Electrical Engineer, Mr. Osborn, of the same company. The testing of spot welded joints is as easy as the inspection of rivetted joints, but it would be advisable to have the inspectors watch the welding process, as well as inspect the weld after cooling. The former inspection will prevent a poor weld being made, by watching the flash between sheets, which is invariably a sign of perfect weld, the second inspection being confined only to rapping the weld with a hammer and judging the weld by the difference in tone to that of the unwelded portion of the sheets. Both inspection methods should supplement one another and should be especially applied to heavy welding work in carrying members of cars, since the use of spot welding in connection with steel inside finish would hardly call for more than a general inspection. There is no doubt at all that this is the future of the steel freight car, and I am certain that electrical spot welding will be successfully adopted for all steel passenger cars as well. The commercial success of this method is guaranteed, since this process will mean a considerable reduction in the price of cars, amounting to from 3 to 3½% of the price total of the car figured on a rivetted basis.

MAINTENANCE.

The maintenance of steel passenger cars is one of the most serious questions with railway companies, excepting, of course, those roads that are in a position to build their own cars and which, therefore, can take care of the repairs of their equipment with the machinery they use for the construction of new cars. Another item which was not heeded well enough in the first cars built, and which is now going to bother those members of the railway fraternity that have to keep the cars in working condition, is the question of rust protection in places not visible, between outside shell and inside finish of cars.

We know that a body kept at a certain low temperature, and afterwards transferred to a place of higher temperature with a high percentage of humidity, will sweat or condense moisture on its surface, until the body has risen in temperature to that of the surrounding air, at which point the condensed moisture will be slowly absorbed by the air. The amount of moisture taken up is largely dependent on several factors, like the ductility and temperature of the condensing surface, thickness of sheets, moisture, temperature and volume of surrounding air, etc.

In steel passenger cars the inside face of the outside steel shell is that part of the car most subject to this occurrence, and what conditions are prevalent at this particular place? The steel sheets were sandblasted, and after that given either a coat of red lead mixed with an indifferent grade of linseed oil of the quick drying "gasoline" variety, or the car was coated on the inside with two or three coats of poor varnish. On top of this was applied by means of wooden strips or o.h.s. straps a layer of ⅜ to ¾ in. hair felt insulation quilted in paper, the whole being enclosed by anything but an airtight inside finish.

In the winter the temperature in the car is kept about constant, the humidity is rising, caused by exhalation of the passengers, reduced ventilation only takes place, and the result of this is that a highly humid air current is set up in the space between outside and inside shell of car, caused by leaks in the inside finish. The outside shell is constantly cooled through the movement of the car, condensation takes place on the inside surface of the outside shell, the force and extent of which is dependent on the care and material with which the sheets have been coated. The condensation freezes between the hairfelt insulation and the outside shell. Warm weather sets in, the ice thaws, and the water settles at once in the hair felt, from which place it is hard to dislodge. Meanwhile freezing and thawing have some influence on the sheet insulation material, the coat of paint, naturally poor, has given way in the form of cracks, flaking off sets in and the moist hair felt will start rusting in a very short time.

A better system of rust protection has been introduced of late, consisting of the application of an elastic coat of varnish applied to the sand blasted inside surface of the outer shell, which is covered before setting with a blast of finely broken cork dust. This process can be repeated several times until the treated surface becomes almost non condensing, by reducing ductility through the cork layer, after this the hair felt is applied by means of nails previously welded to the inside surface of the outside shell, by means of their heads, the points projecting inwards. The hair felt or other insulation material is impaled on these nails and the latter bent over after the insulation sheets had been pushed to the outside sheets. This prevents the movement of hair felt on the surface of inside shell and consequently keeps the cork surface in good condition. I think it would be worth while to improve further on this system by means of a waterproof coating on top of the quilting and a careful pasting down of insulation joints in order to prevent every possibility of water condensing on the sheets.

In an experimental way the use of calcium chloride, applied in fixed receptacles between outside and inside shell, would be worth while trying, since the latter is a powerful moisture absorbing agent without doing any harm to steel or other metals. In all cases the inside finish ought to be applied as tight as possible and all fissures closed. The application of sheething to the outside of steel cars, in imitation of wooden cars, consisting of a series of sheets, pressed or drawn to the well known keystone shape and fastened to the carrying sheets by means of screws or rivets placed in the depressions of the sheets, which in turn are covered by keystone shaped steel troughs, fitting into the dovetails of the first applied sheething and placed in position by sliding them into place from the side sill edges of the car, after the troughs have been coated with a specially prepared varnish, has not proven very successful. The composition material smeared into the keystone openings of the later used wooden blocks, visible on the bottom edge of the cars, have dropped out in places in the course of time, moisture got in and you can imagine the result in some of the cases, after a lengthy exposure.

A handy tool for the repair of damaged steel cars and for any class of passenger car work as well, is one of the gas welding outfits with cutting attachments now so popular in the car shops of this continent. The system used is more or less dependent on the work to be done and the facilities on hand.

Oxygen hydrogen welding will be welcomed at those places where direct electrical current is obtainable at low prices and the use of a supplementary acetylene tank for the mixture of hydrogen with acetylene for welding purposes will permit the raising of welding temperatures from 3.900° for the oxygen hydrogen system to 4.900° which temperature is more than enough for any kind of work in the steel

passenger car repair shop. Oxygen acetylene, oxygen oil gas, oxygen blaugas, and oxygen coal oil vapor-gas welding outfits and the scope of their work are at present so well known that it is hardly worth while to go into details.

When looking forward to electrically welded (spot welded) steel passenger cars, the question of repairs is seen in an entirely new aspect. As long as the use of patches, as for instance in freight car service, would be permissible, the item of repairs would be easily enough answered, but I am sure that no railway company of the present day would permit the use of visible patched cars, or would even tolerate the use of rivets for the replacement of the new sheets. Joints of spot welded sheets are hard to separate, since there are no rivet heads to be cut off, which would permit the separation of a combination into its units. The cutting torch would have to be employed to cut the damaged sheets or rivets out, after which the remaining strips of material of the damaged sheets, welded to the uninjured sheets, would have to be separated by means of heating with the welding torch, rolling up of the impaired material, and cutting welds with torch or chisel.

In the construction of spot welded cars considerable care would have to be taken in designing the car, so that in case of repairs the repaired parts would be accessible with the spot welding machine, since rivet joints would be excluded from use, as they would not fit in with the design of the uninjured part of the car.

All these questions are, however, solvable, and they will be eventually simplified by the use of specially designed tools for this purpose, so that these apparent drawbacks will more than outweigh the cheaper construction and the greater rigidity of the joints.

(To be Continued.)

Canadian Northern Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those for 1911-12, from July 1, 1912:—

	Gross Earnings	Expenses	Net Earnings	Increase
July	$1,829,700	$1,335,100	$494,600	$133,000
	$1,829,799	$1,335,100	$494,600	$133,000
Incr.	$ 353,800	$ 220,800	$133,000	.....

The mileage in operation during July was 4,297, against 3,711 in July, 1911.

Approximate earnings for Aug., $1,745,800, against $1,420,600 for Aug., 1911.

Canadian Pacific Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases or decreases, compared with those for 1911-12, from July 1, 1912:—

	Gross Earnings	Expenses	Net Earnings	Increase
July	$12,052,398.58	$7,604,221.68	$4,448,176.90	$745,148.57
	$12,052,398.58	$7,604,221.68	$4,448,176.90	745,148.57
Incr.	$ 2,390,580.44	$1,645,431.87	$ 745,148.57	.....

Approximate earnings for Aug., $11,886,000, against $10,073,000 for Aug., 1911.

During August, the mileage operated was increased to 11,178.

Grand Trunk Railway Earnings, Etc.

Aggregate from July 1 to Aug. 31:—

	1912.	1911.	Increase.
G.T.R.	$7,650,473	$6,890,203	$760,270
C.A.R.	402,272	366,945	35,327
G.T.W.R.	1,168,503	1,124,775	43,728
D.G.H. & M.R.	393,618	364,120	29,498
Totals	$9,614,866	$8,746,043	$868,823

Approximate earnings for Aug., $4,966,415, against $4,502,674 for Aug., 1911.

Western Canada Railway Club.—At the monthly meeting, Sept. 9, J. E. Forslund, General Colonization Agent, C.P.R., read a paper on the relation of the company's land and immigration department to the traffic department.

Mainly About Transportation People.

SIR WM. C. VAN HORNE has been elected Chairman of the Metropolitan Parks Commission, Montreal.

SIR WILLIAM MACKENZIE returned to Toronto, Sept. 3, after a business trip to the Pacific coast.

E. J. CHAMBERLIN, President G.T.R. and G.T.P. Ry., has been elected a director of the Montreal Warehousing Co.

D'ARCY SCOTT, Assistant Chief Commissioner Board of Railway Commissioners, left Ottawa, Sept. 6, for a European trip.

J. R. LECKIE, G.T.R. locomotive foreman at Stratford, Ont., was married to Miss M. Hamilton at Palmerston, Ont., Sept. 5.

H. L. DRAYTON, K. C., took up the duties of Chief Commissioner of the Board of Railway Commissioners at Ottawa, Sept. 4.

CECIL B. SMITH, M. Can. Soc. C. E., who died in Toronto recently, left an estate valued at $126,870.90, to his widow and two sons.

J. S. W. DOUGALL, President Dougall Varnish Co., Ltd., Montreal, has been elected a Director of the Canada Accident Assurance Co.

P 298 A. Copony,
Chief Draughtsman, Car Department, Grand Trunk Railway.

G. D. PERRY, General Manager Great North Western Telegraph Co., Toronto, and Mrs. Perry, have been spending a short time at Brackley Beach, P.E.I.

C. W. RHODES, who acted as paymaster G.T.R. during construction of the Western division from 1880 onwards, died at Victoria, B.C., Sept. 4, aged 51.

MISS C. PARENT, daughter of S. N. Parent, formerly Chairman National Transcontinental Ry., was married to A. C. Major, of Ottawa, at Dorion, Que., Sept. 11.

T. CLARKE, for 30 years foreman of the G.T.R. yards at Point St. Charles, Montreal, and from which he retired in 1905, died in the Royal Victoria Hospital, Montreal, Aug. 29.

L. J. STREET, heretofore Vice President, Canadian Inspection Co., Toronto, Toronto, has been appointed as salesman on the Dominion Iron and Steel Co.'s staff at Sydney, N.S.

MRS. W. H. GRANT, wife of the Manager of Construction, Mackenzie, Mann and Co., Ltd., returned to Toronto early in September, after spending the summer in Europe.

SIR WM. C. VAN HORNE is reported to be interested in the formation of the Canadian Steel Package Co., a charter for which is being asked from the Dominion Government.

THOS. O'KEEFE, who is referred to in a press report as Assistant Roadmaster, Michigan Central Rd., Welland, Ont., died there, Sept. 23, from an affection of the bronchial tubes.

ANSON CAMPBELL, insurance broker, Montreal, who died in the Royal Victoria Hospital there, Sept. 2, aged 78, was for a number of years Assistant Treasurer of the old South Eastern Ry.

O. A. TRUDEAU, advertising clerk in the G.T.R. District Passenger Agent's office, Montreal, was married Sept. 16 to Miss S. Paquette. The office staff presented him with an easy chair.

MRS. D. B. HANNA, wife of the Third Vice-President, Canadian Northern Ry., returned to Toronto early in September, with her family, after spending several weeks at Lake St. Joseph, Que.

W. D. MATTHEWS, Director C.P.R., has been elected Vice-President Canadian General Electric Co., to fill the vacancy caused by the death of H. P. Dwight, President Great North West Telegraph Co.

JAS. DUNSMUIR, director C.P.R., with Mrs. and Miss Dunsmuir, arrived in Montreal, Sept. 15, from England, where they had been for the past year. They subsequently left for their home in Victoria, B.C.

DUNCAN MacPHERSON, Assistant to the Chairman, National Transcontinental Railway Commission, has resigned the chairmanship of the Canadian Society of Civil Engineers' committee on railway ties.

MISS M. G. NANTON, daughter of A. M. Nanton, formerly Managing Director, Alberta Ry. and Irrigation Co., was married in Winnipeg, Sept. 5, to Lorne Cameron, son of the Lieutenant-Governor of Manitoba.

The Countess Jacques de Lesseps, daughter of SIR WILLIAM MACKENZIE, with her son, returned to Europe in September, accompanied by her sister, Mrs. W. Beardmore, after having spent the summer in Canada.

The Rt. Hon. Sir Richard J. Cartwright, G.C.M.G., who died at Ottawa, Sept. 24, following an operation for strangulated hernia, was father of A. D. CARTWRIGHT, Secretary of the Board of Railway Commissioners.

D. C. McNAB has been appointed Deputy Minister of Railways, Telegraphs and Telephones for the Saskatchewan government, vice S. P. Porter, who was recently appointed Executive Agent, G.T. Pacific Ry., Regina, Sask.

SIR THOS. SKINNER, London Eng., director C.P.R., arrived in Quebec, Sept. 13, and proceeded to Winnipeg and other western points, in connection with the business of the Hudson's Bay Co., of which he is Deputy Governor.

J. J. HILL, ex Chairman of the Board, Great Northern Ry., was entertained at dinner in St. Paul, Minn., on Sept. 16, his 74th birthday, by citizens of that place and other friends throughout the northwest, about 1,200 being present.

J. W. SIFTON, who died at Winnipeg, Sept. 19, built the telegraph line from

Winnipeg to Fort Pelly in the seventies and was also a contractor on the C.P.R. when portions of it were being built by the Dominion Government.

The Canadian Ticket Agents' Association has enrolled the following new members recently:—C. R. Coleman, C.P.R., Truro, N. S.; C. E. Hardy, C.N.R., Sudbury, Ont.; W. A. Cameron, G.T.R., Durham, Ont.; W. R. Widdess, G.T.R., Lindsay, Ont.

G. E. WADLAND, who succeeded the late H. W. Mills, as Manager of the Sarnia Street Ry. recently, has also been appointed G.T.R. town ticket Agent at Sarnia, Ont., to succeed Mr. Mills, and has joined the Canadian Ticket Agents' Association.

V. A. HARSHAW, Superintendent C.P.R., Woodstock, N.B., while starting out on an inspection trip on his railway motor car, Aug. 28, collided with a team at a crossing, and was thrown out, but escaped with a bad bruising and some minor injuries.

M. FLYNN, for many years Master Mechanic Michigan Central Rd., was accidentally suffocated by coal gas in his house at St. Thomas, Ont., recently. One of his sons, W. H. Flynn, is Superintendent of Motive Power M.C.R. at Detroit, Mich.

A. D. McRAE, of Davidson and McRae, and associated with the Mackenzie, Mann and Co.'s industrial enterprises in British Columbia, will, it is said, be gazetted honorary Lieut.-Colonel of the 6th Regt., Duke of Connaught's Own Rifles, Vancouver, B.C.

J. A. THOMPSON, Dominion Inspector of Steamboats, died in the Jubilee Hospital, Victoria, B.C., Sept. 2, aged 65. He arrived in British Columbia in 1886, and after three years' service on coasting steamers was appointed Inspector of Steamboats there.

C. Le B. MILES, M. Can. Soc. C. E., who for some time past has been Division Engineer on Algoma Central and Hudson Bay Ry., construction builder at Michipicoten Harbor, Ont., has returned to Calgary, Alta., where he is going into private practice and contracting.

G. I. EVANS, who has been appointed Superintendent of Angus Locomotive Shops, C.P.R., Montreal, was born there, May, 1880, and entered C.P.R. service, April, 1900, since when he has been, to Mar., 1906, draughtsman; Mar., 1906, to July, 1910, Chief Draughtsman; July, 1910, to Aug., 1912, Mechanical Engineer.

F. G. MILLEN, who has been appointed Assistant Treasurer, C.P.R., Montreal, was born there, Feb. 21, 1875, and entered C.P.R. service, June 1, 1890, since when he has been, to Oct. 1, 1890, in Accounting Department; Oct. 1, 1890, transferred to Secretary's office, where he has served in various capacities, being, at the date of his present appointment, Aug. 30, chief clerk.

A. P. GILLIES, who attracted considerable notice in Toronto as the promoter of a plan for the building of a great central terminal station hotel and office building during the past two or three years, has been sent to jail at Tacoma, Wash., in default of finding bail for $10,000, pending an investigation of alleged fraud in connection with an industrial concern he was promoting there.

S. P. PORTER, who has been appointed Executive Agent, G.T. Pacific Ry., Regina, Sask., and whose portrait appears in this issue, was born in 1870, in Somersetshire, Eng., and came to Canada in 1886. He entered railway service in 1889, with the C.P.R., as trainman. From 1901 to 1907, he was homestead inspector for the Dominion government, and in 1908 he was appointed Deputy Minister of Railways, Telegraphs and Telephones for Saskatchewan, which position he resigned some few months ago.

SIR THOS. G. SHAUGHNESSY, President C.P.R., left Montreal, Sept. 4, on his annual trip of inspection over the company's lines west of that city. He was accompanied by Sir Edmund Osler, R. B. Angus, and W. S. Matthews, directors; F. F. Begg, London, Eng.; and Jas. Redmond, Montreal. George Bury, Vice President and General Manager, Western Lines, accompanied Sir Thomas from Fort William to the Pacific Coast and back. At different points of the trip the party was met by the general superintendents and other officers, who travelled over their respective divisions. Sir Thomas returned to Montreal Sept. 23.

M. J. POWER, whose appointment as General Purchasing Agent, C.P.R., Montreal, was announced in our last issue, was born at Montreal, June 19, 1877, and entered C.P.R. service, Mar. 16, 1891, since when he has been, to Nov., 1893, office boy, etc., General Passenger Department, Montreal; Nov., 1893, to May, 1897, stenographer, same department; May, 1897, to June, 1898, secretary to General Passenger Agent, Montreal; June, 1898, to Aug., 1901, secretary to

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S. P. Porter,
Executive Agent, Grand Trunk Pacific Railway.

Passenger Traffic Manager, Montreal; Aug., 1901, to July, 1908, secretary to the President; July, 1908, to July 29, 1912, chief clerk and private secretary to the President.

The Montreal daily press recently announced the death of ALLAN CAMERON, in London, Eng., on Sept. 12, and stated that he held the position of General Traffic Agent, C.P.R., New York, since Jan., 1909. The dispatch from London, Eng., stated that the death had occurred there of Allan Cameron, second son of the late Hon. John Hillyard Cameron, of Toronto, aged 61. Allan Cameron, of the C.P.R. service, was born at Toronto, March 14, 1864, and was, for a time General Traffic Agent, C.P.R., New York, but in February last was appointed Superintendent Land Branch, Department of Natural Resources, C.P.R., Calgary, Alta. He still occupies that position.

B. F. SHORTLEY, who has been appointed Terminal Agent, Intercolonial Ry., Bonaventure station, Montreal, was born at Montreal, June 24, 1866, and entered railway service, Sept. 27, 1887, since when he has been, to May 1, 1900, in G.T.R. service, as switchman at St. Hyacinthe, Que., telegraph operator at various points, including three years at St. Lambert, Jct., Que., and from 1893, as train dispatcher at Montreal, Belleville, Ont., and Island Pond, Vt.; May 1, 1900, to the date of his present appointment, in I.R.C. service at Bonaventure station, Montreal, as clerk, operator, assistant to Terminal Agent, and acting Terminal Agent.

The Minneapolis, St. Paul and Sault Ste. Marie Ry. report for the year ended June 30, contains a memorial notice, recording the directors' appreciation of the late W. D. WASHBURN, a former director of the company, who died recently. In part, it reads:—"In the fullness of years and achievement, the first President of this company, and one of its directors from its organization, he passed away in Minneapolis, Minn. In his death, not only has this company lost an able and loyal conservator of its interests, but the board has also parted from a personal friend, whose presence and counsel will be deeply missed after the association of so many years. He saw the incalculable benefit to his home city and the northwest, of a highway of commerce to the seaboard by way of Sault Ste. Marie, and surmounted all apparent obstacles, and with other associates, whose interest he enlisted in the enterprise, began the construction of such a highway, and to-day the Soo line exists as a monument to his enterprise and genius."

A. COPONY, an article by whom, on suggestions and deductions from steel passenger cars, appears on another page, and whose portrait also appears in this issue, is a British subject, born in Vienna, Austria, in 1880, where he was educated in the public and high schools, and the Engineering College, whence he graduated in 1901. After serving in various capacities with some English machinery manufacturers, at their branches in Vienna and Fiume, Hungary, he went to the U. S. in May, 1907, and from that date to Feb., 1910, was engaged with the Standard Steel Car Co., Butler, Pa., as draughtsman, and assistant chief draughtsman, and at the company's Hammond works, where he was Master Mechanic, Passenger Car Department. From Feb. to Oct., 1910, he was in charge of toll designing for the American Car and Foundry Co.'s new passenger car shops at St. Charles, Mo., and later on was engaged on experimental work in the company's St. Louis shops. He resigned in Oct., 1910, on his appointment as Chief Draughtsman, Car Department, G.T.R. Western Division, and was shortly after transferred to Montreal as Chief Draughtsman, Car Department, same company.

The Canadian Ticket Agents' Association's 26th annual meeting will be held in Ottawa, Oct. 9 and 10. The headquarters will be at the Chateau Laurier, where the business meeting will be held. The social features will include a visit to the Parliament buildings, a car ride around the city, a trip on the Ottawa river, theatre and other social parties. On Oct. 11 the party will leave for Montreal, and will partake of afternoon tea on the Donaldson line s.s. Saturnia. That evening they will board the White Star-Dominion line s.s. Laurentic and leave at daybreak on Oct 12 for Quebec, where they will disperse.

W. BELL, at one time President, Guelph Junction Ry. Co., and one of the founders of the Bell Piano and Organ Co., Guelph, Ont., was found dead on the G.T.R. track near that city, Sept. 26, his body having been badly mutilated by a train.

Railway Development.

Projected Lines, Surveys, Construction, Betterments, Etc.

Alberta Interurban Ry.—There has been deposited with the Secretary of State at Ottawa a mortgage deed dated April 12, between the company and the Trust and Guarantee Co., covering the company's whole undertaking, present and future.

The Board of Railway Commissioners has approved of location plans for this line from the north line of sec. 31, tp. 24, range 28 west 4th meridian to sec. 15, tp. 29, range 23 west 4th meridian, mileage 9.93 to 66.80, and has authorized it to build along highways.

Algoma Central and Hudson Bay Ry.—The Board of Railway Commissioners has authorized the opening of the line for traffic from Hawk Lake jct. to a junction with the C.P.R. transcontinental line near Hobon, Ont., 31.5 miles. Hawk Lake jct. is at mileage 164.5 on the main line from Sault Ste. Marie, and is the point where connection is made with the company's branch line to the Helen and other mines and to Michipicoten harbor.

In connection with the extension of the line from near Pangissin to Park Lake jct., T. J. Drummond, President Lake Superior Corporation, is reported as stating, Sept. 5, that it was expected to be able to put on a regular train service through from Sault Ste. Marie in November. About 25 miles of the track had to be ballasted. North of the C.P.R., 12 miles of track had been laid and it was expected that by the end of the year track would be laid for a further distance of 48 miles to the crossing of the Canadian Northern Ontario Ry. It was expected to have the line completed to a junction with the G.T. Pacific Ry. by the end of 1913. (Sept., pg. 450.)

Burrard Inlet Tunnel and Bridge Co.—The North Vancouver city council has voted an additional $50,000 in aid of the building of the projected bridge across the second narrows of Vancouver inlet. (Sept., pg. 450.)

Central Ry. of Canada.—We are officially advised that the company has ordered in the U. S., 1,500 tons of 80 lb. steel rails for prompt delivery. This is in addition to an order previously given the Algoma Steel Co. Track laying will be started as soon as grading is completed from McAlpine to the Norton river, Ont. Ties have been delivered for the first 30 miles. All the bridges and culverts are under construction, and a contract has been given the Canadian Bridge Co., Walkerville, Ont., for the steel viaduct over the Scotch river. The station yard at McAlpine has been laid out, and a station, to be used jointly with the C. P. R., is about to be built. Construction will be pushed ahead west of South Inchorn as rapidly as possible. Construction is also under way east of McAlpine, through Hawkesbury, St. Andrews, and St. Eustache, thence on to the Back river and into Montreal. F. Stuart Williamson is Chief Engineer. (Sept., pg. 450.)

Delaware and Hudson Co.—We are officially advised that there is no truth in the press report which stated that the company was securing a large area of land on the south shore, opposite Montreal, east of the Chambly road, upon which to lay out a yard and to build a roundhouse and repair shops. (July, pg. 339.)

Dominion Atlantic Ry.—Plans for the erection of additional wing walls for a bridge at Bridgetown, N.S., and for a bridge over the Avon river at Windsor, N.S., have been approved by the Board of Railway Commissioners.

The Board of Railway Commissioners has approved of revised location plans for the line across Gaspereaux river, just east of Horton Landing, N.S., and of plans for the substructure of the proposed new bridge across the Gaspereaux river.

A contract has been entered into, under the act granting subsidies to certain railways, between the company and the Department of Railways, for the building of a line, not to exceed 15 miles, from Centreville westerly to Weston, N.S. (Sept., pg. 450.)

Edmonton, Dunvegan and British Columbia Ry.—The Board of Railway Commissioners has approved of location plans from mileage 0 to 5.13, out of Edmonton, Alta.

The Minister of Railways has approved of route maps for revised location of the line north of Edmonton for 45 miles.

It is reported that grading has been practically completed from near Edmonton to Athabasca Landing, and that track laying will be started at once. A. C. Galbraith, Provincial Superintendent of Works, is reported as stating that it is expected to have the track laid to Athabasca Landing this year.

There has been filed with the Secretary of State at Ottawa a trust deed dated July 22, made between the company, the National Trust Co., and the province of Alberta, covering the company's property as security for the 30 year 4% bonds which are guaranteed by the province. (Sept., pg. 450.)

Fort George to Barkerville.—Application is being made to the British Columbia Legislature to incorporate a company to build a railway from the Nechaco river near Fort George, southeasterly to the Fraser river, along the valley of that river to Six Mile creek, then easterly and southeasterly to Willow river, then northeasterly to Bear river, and then southeasterly to Barkerville, B.C. Burns and Walkem, Vancouver, are solicitors for applicants.

Interprovincial and James Bay Ry.—The Minister of Railways has approved of route map for this projected railway for 54 miles northerly from the terminus of the C.P.R. Kipawa branch at Kipawa, Que. (May, pg. 239.)

Erie, London and Tillsonburg Ry.—We are officially advised that J. H. Teall, the original promoter of this railway, has sold the company's charter and assets to the G.T.R.; and that construction was formally started on the line a short distance north of Port Burwell, Ont., July 30. (Sept., pg. 450.)

Esquimalt and Nanaimo Ry.—R. Marpole, Vice President, and H. E. Beasley, General Superintendent, recently concluded an inspection of the extensions under construction. The grading on the extension from McBride jct. to Lake Qualicum is practically completed, with the exception of a section near Deep bay; about 75% of the Platt river section is completed; and progress has been made on the Trent river-Union bay section. The location of the branch line from Courtney to Duncan bay was also inspected. (Sept., pg. 450.)

Fredericton and Grand Lake Coal and Ry. Co.—Track laying is reported to have been started at Gibson, N.B., on the line to Minto, and it is expected that track laying will be started at the Minto end in a short time. Connection will be made with the C.P.R. by crossing the bridge at Fredericton. At Minto the line will connect up with the line of the New Brunswick Coal and Ry. Co., which took over the old Central Ry. of New Brunswick and which will be taken over from the New Brunswick Government. This line gives connection with the Intercolonial Ry. at Chipman. Press reports state that it is proposed to build a spur line eight miles from Minto to the National Transcontinental Ry.

The development of the coal areas is being carried on by the Minto Coal Corporation, organized by Sir Thos. Tait, with a capital of $400,000. A large number of coal properties have been taken over, and it is expected that the development work will have been so far advanced, that coal production can be begun in December. There are at present four producing collieries, having an output of 6,000 tons a month, giving traffic to the existing railway. It is estimated that the Minto coal field contains about 150,000,000 tons. (Sept., pg. 450.)

Ha Ha Bay Ry.—The Department of Railways has entered into a contract with the company, under the terms of the act granting aid to certain railways, for the building of the following lines: From a junction with the Quebec and Lake St. John Ry. in Jonquiers tp., to St. Mathias, Que., not exceeding 20 miles; from La Crosse jct. to the Saguenay river, northerly through Chicoutimi, Que., not exceeding five miles; from La Terriere jct., southerly via La Terriere village to Lake Kenogami, not exceeding 10 miles; from the existing line near Bagotville, Que., easterly to St. Alexis, Que., not exceeding 3 miles. (May, pg. 238.)

Intercolonial Ry.—Tenders are under consideration for the erection of an addition to the freight car repair shops at Moncton, N.B.

We are officially advised that the engineering staff is making a survey of the Cape Breton section of the line between Point Tupper and Sydney, N.S., with a view of bettering the gradients and alignment.

In an interview Sept. 12, W. F. Tye, formerly Chief Engineer, C.P.R., is reported as stating that he considered the Dominion Government should lose no time in extending the Intercolonial Ry. to Georgian Bay. A new double track, low gradient line from Montreal to Georgian Bay, is urgently needed. The traffic, he says, is already waiting for it, and the line is needed to relieve the congestion of the present railways. (Sept., pg. 450.)

Kettle Valley Lines.—Press reports state that Grant Smith and Co., Spokane, Wash., have been given a contract for building 57 miles of line from the lower end of the lake near Summerland, through Naramata to Hydraulic summit, near Kelowna, B.C. The reports also state that track has been laid to within 12 miles of Hope summit, from near which point it is said that a joint line will be built to Hope in conjunction with the Vancouver, Victoria and Eastern Ry. and Navigation Co. (Sept., pg. 450. See also under Great Northern Ry. Lines in Canada.)

Kootenay and Alberta Ry.—The Board of Railway Commissioners has authorized the opening of this line for freight traffic. The speed is not to exceed four miles an hour over trestles, and 10 miles an hour on the rest of the line, light power to be used, watchmen to be kept on each trestle, and the towers and foundations under truss spans to be inspected at least once a week.

This line is 13 miles, which has been built by the Western Coal and Coke Co., from Pinetree harbor, on the C.P.R.'s Crowsnest Pass line to the company's

coal mine at Beaver creek, Alta., was considerably delayed in construction, owing to a variety of causes, principally wet weather and sliding ground. The track laying was, however, completed to the mine on June 25, and a train was run over it. The line is of standard construction, with light gradients and easy curvature. Three miles of sidings have been built to the colliery and storage yards. There are some large timber structures, particularly over Langs coulee, at mileage 7, which is 195.5 ft. high, and at Mill creek, mileage 10, which is 159.5 ft. high. One big cut required the excavation of 149,000 cubic feet. The directors anticipate that as the line traverses an excellent agricultural district, its revenue from the carriage of farm produce will be an important addition to those derived from the transportation of coal. L. B. Merriam is Chief Engineer. (Sept., pg. 450.)

London and Port Stanley Ry.—In connection with the proposal to lease this line to the Lake Erie Coal Co., the directors ask that some new freight shed and station accommodation be provided at Port Stanley, Ont. The L.E.C. Co. proposes to expend $400,000 on electrifying the line in return for a 25 years lease. The directors have bought 22 acres of land for an extension of the freight yards at Port Stanley. It is expected that the lease will be signed at an early date. (Feb., pg. 68.)

Medicine Hat, Alta.—The plans of the building of the spur line from the Ansley colliery into Medicine Hat, Alta., have been completed, and application is being made to the Board of Railway Commissioners for their approval. The right of way is being acquired, and arrangements made for starting construction. Mr. Ansley states that he expects to have the line built this year. (July, pg. 339.)

Michigan Central Rd.—The Board of Railway Commissioners has approved of plans for the erection of a bridge across London street, Windsor, Ont. (Aug., pg. 412.)

Minneapolis, St. Paul and Sault Ste. Marie Ry.—Press reports state that a contract has been let for the building of a spur line of three miles to the mines on Cuyuna range, Minn.. F. Baxter, Superior, Wis., is the contractor. (Sept., pg. 451.)

Northern New Brunswick and Seaboard Ry.—A contract has been entered into between the company and the Department of Railways, under the act granting subsidies in aid of certain railways, for the building of 26 miles of railway from the Drummond mines at Austin Brook to the Intercolonial Ry., and thence to Alston Point, N.B. The line from Austin Brook to the Intercolonial Ry. has been built and is being operated. (Aug. pg. 412.)

Northern Pacific Ry.—President Elliott is reported as stating, Sept. 5, that the line from Seattle, Wash., to Sumas, on the International boundary, 120 miles, will be rebuilt next year, with reduced gradients and easier curves, and that it will be relaid with heavier steel.

Pacific Great Eastern Ry.—A commission has been appointed to settle the question of the route of the line in West Vancouver, B.C. The company has located its line along the waterfront for 2.5 miles, and the municipality desires that it be set back for from 100 to 250 ft. Application has been made to the Provincial Minister of Railways for the approval of the route of the line from Howe sound to Pemberton Meadow, 10 miles, but objection is made by the Howe Sound and Northern Ry., which has a line between the same points. Consideration of the matter was adjourned. The P.G.E. Ry. has power to acquire the H.S. & N. Ry., but so far they have been unable to come to terms.

Vice President D'Arcy Tate, is reported as stating, Sept. 5, that the funds necessary for construction had been provided, and that work would be gone on with as soon as the plans were approved. An additional survey party, under F. G. Ashe, has been put in the field to work from Lillooet southwesterly. (Sept., pg. 451.)

Pacific and Hudson Bay Ry.—The route of this projected railway for the section of the line from Bella Coola, to Natalkus lake, B.C., 230 miles, has been approved by the Minister of Railways. The line starts at Bella Coola, at the head of Burk channel, and follows the valleys of the Bella Coola and Athnarko rivers to Two Mile lake, thence crossing to the valley of the Salmon river, which is followed for some distance, thence to the valley of the Entico river to Natalkus lake. C. E. Cartwright, Vancouver, is Chief Engineer. (Aug., pg. 412.)

Quebec and Saguenay Ry.—A contract under the act granting subsidies to certain railways has been entered into between the company and the Department of Railways for the building of 62.8 miles of line from St. Joachim, Que., northeasterly.

Practicany all the work on the construction of the line is reported to have been suspended owing to financial troubles. Sir Rodolphe Forget, President, is quoted as stating, Sept. 2, that trouble had been going on between the shareholders for some time, before it was decided to suspend operations. It was reported from Quebec Sept. 3, that 44 actions had been entered by employes on construction, and on Sept. 7, an action was entered against the company by O'Brien and Doheny, the general contractors, to recover $381,988.42 for work done and money paid.

The annual meeting was held in Quebec, Sept. 17. The following are the directors and officers for the current year:—President, O. B. Daoust; Vice President, H. G. Matthews; other directors:—Sir Rodolphe Forget, L. G. Morin, L. E. Morin.

St. John and Quebec Ry.—The New Brunswick Government, Sept. 10, finally approved of the plans for the building of the Gagetown-Swan creek section of the line. The Government has now approved of the plans for the whole line within the province. (Sept., pg. 451.)

Timiskaming and Northern Ontario Ry.—Track laying on the Elk Lake branch of 29 miles is reported to have reached the Jean Baptiste river, 12 miles west of Earlton, Ont., and ballasting is in progress. A large timber bridge is being built across the river, and it is expected that track laying will be resumed on the 10 miles between the Jean Baptiste river and the Montreal river, by Sept. 30. This river will be crossed at the Mountain chutes, by a steel bridge, for which a contract has been let. Grading has been practically completed into Elk Lake, and it is expected that the branch will be completed by Dec. 1. (Sept., pg. 451.)

Toronto, Hamilton and Buffalo Ry.—General Superintendent Eber is reported as stating, Sept. 10, in connection with the application being made to the Board of Railway Commissioners for an order compelling the depression of tracks in the city, "We have been trying to correct the existing conditions for some time, but it is a matter demanding careful attention and the gathering of many details from different sources. We have had engineers working for some time on the idea of depressing the tracks, but I cannot say just now what they are ready to report. They have reached no definite conclusion. It is a vital question, both to the city and ourselves, and our aim is to satisfy everybody. In my opinion the outcome depends on the city's attitude." (June, pg. 302.)

Wellington Colliery Ry.—A meeting of shareholders was held in Victoria, B.C., Aug. 30, at which resolutions were considered authorizing the directors to issue debentures, subject to the approval of the Minister of Railways, and to authorize the directors to purchase such other railways as might be desirable for the carrying on of the company's colliery business. (Aug., 1908, pg. 551.)

Toronto Union Station.

The question of the Toronto union station was down on the list of matters to come before the Board of Railway Commissioners in Toronto, Sept. 26, in connection with the city council's application for the final approval of plans, and for the fixing of a definite date when work is to be started.

Speaking of the new union station, Sept. 5, Sir Thomas G. Shaughnessy, President C.P.R., is reported to have said: "Work can be started on the building immediately. All that the C.P.R. asks is that the station be known as the union station. Our road will not run into any station that bears the name of another company. The company has already commenced work on the grade separation which must be completed before the new building can be erected."

In the course of an interview, Sept. 9, E. J. Chamberlin, President G.T.R., is reported to have said he could not state when actual construction would begin. It would take three months for the architect to prepare the plans necessary before it would be possible to call for tenders. The chief engineers of the two lines were engaged on the preparation of detailed plans. The C.P.R. would occupy the new station jointly with the G.T.R.

Railway Route Maps Approved.

The Minister of Railways has approved the following route maps:—

Canadian Northern Branch Lines Co.—Aug. 30. From tp. 18, r.l., w.p.m., to tp. 26, r.l., w.p.m., 38 miles.

Canadian Northern Ontario Ry.—Sept. 10. Through Montreal Island, about 17 miles.

Canadian Pacific Ry.—Sept. 16. From Hawarden to Floral, Alta., 46.8 miles.

Edmonton, Dunvegan and British Columbia Ry.—July 26. Revision north of Edmonton, Alta., about 45 miles.

Erie, London and Tillsonburg Ry.—July 24. From Aylmer to Port Burwell, Ont., about 12 miles.

Interprovincial and James Bay Ry.—Aug. 30. From Kipawa branch, northwesterly, 54 miles.

Canadian Pacific Railway Company

North Toronto Grade Separation

NOTICE TO CONTRACTORS

Sealed proposals will be received by the undersigned, up to 12 o'clock noon on Saturday, October 5, for the construction of the substructure of the AVENUE ROAD SUBWAY, at North Toronto.

Plans and specifications can be seen at the office of the Engineer of Grade Separation, at No. 260 Avenue road.

The lowest or any tender not necessarily accepted.

P. RILEY,
Engineer Grade Separation.

Toronto, Sept. 23, 1912.

Canadian Northern Railway Consolidation Locomotives.

The Canadian Locomotive Co. is delivering to the C.N.R. 25 consolidation locomotives for freight service, equipped with the latest type of superheater. These locomotives weigh in working order 188,600 lbs., and are of the usual type of consolidation locomotives, with semi-wide firebox over frames. Three hundred and forty-eight flexible staybolts are used in the breaking zone of firebox. The ashpan is of the C.N.R. style of hopper bottom. Outside steam pipes are used, incased within an air tight jacket secured to cylinder and smoke box. This arrangement eliminates most of the obstruction in the smoke box met with when using the inside steam pipes. The Pyle National electric headlight is used. The boiler is fed from the top, through an arrangement of check valves in base of bell stand. The tender tank holds 6,000 imperial gallons of water and 12 tons of coal. The frame is built of 10 x 13 ins. steel channels. The truck is of the equalized type, with a cast steel bolster. The equipment includes Westinghouse brakes ET no. 6 type, with two 9½ in. air pumps. The following are the principal dimensions, etc.:—

Tractive effort	35,000 lbs.
Weight in working order	188,600 lbs.
Weight on drivers	163,000 lbs.
Weight of engine and tender, total	332,600 lbs.
Wheel base, rigid	15 ft. 6 ins.

Canadian Northern Railway Consolidation Locomotive.

Wheel base, engine, total	23 ft. 9 ins.
Cylinders, diar. and stroke	23 by 26 ins.
Piston valves	12 ins.
Driving wheels, diar	57 ins.
Boiler pressure	180 lbs.
Boiler, diar. at first ring	66⅜ ins.
Firebox, length and width	114 by 40¼ ins.
Tubes, no. and diar.	179—2 ins.
Flues, no. and diar.	24—5⅜ ins.
Tubes, length	14 ft.
Heating surface, tubes and flues	1,772 sq. ft.
Heating surface, firebox	179 sq. ft.
Heating surface, total	1,951 sq. ft.
Superheater heating surface, inside tubes	360 sq. ft.
Grate area	31.8 sq. ft.
Weight on drivers—tractive effort	4.7
Total weight—tractive effort	5.38
Tractive effort x diar. of drivers—heating surface	800.88
Total heating surface—grate area	78.33
Firebox heating surface—total heating surface per cent.	7.18
Weight on drivers—total heating surface	61.02
Volume equivalent cylinder, cub. ft.	12.5
Total heating surface—volume of cylinder	199.28
Grate area	2.54
Equivalent heating surface, 1,951 sq. ft. (1.5 x 360 sq. ft.)	.2491 sq. ft.

Dominion Railway Subsidy Agreements.—The Dominion Government has entered into subsidy agreements for the following construction,—with the Canadian Northern Pacific Ry., Aug. 7, for a line from the Yellowhead pass to Vancouver and the mouth of the Fraser river, 525 miles; and with the Canadian Pacific Ry., Aug. 2, as lessee of the Calgary and Edmonton Ry., for a bridge over the Saskatchewan river, connecting Strathcona and Edmonton, Alta.

Grand Trunk Railway, Betterments, Construction, Etc.

Southern New England Ry.—Press reports state that surveys are being made under the direction of G. M. Thompson, for a line from Hoylake, Mass., eastward to the Central Vermont Ry.; and through New Hampshire, towards Boston, Mass.

St. Lambert Yards, Etc.—In connection with the work now in progress at St. Lambert, Que., press reports state that the company has bought 400 acres of land, and a long strip extending almost to St. Hubert, and that in addition to laying out yards there, locomotive and other shops will be built. These will not replace the Point St. Charles shops, but will, it is said, be utilized for G.T. Pacific Ry. purposes. One report says that the new shops will be completed within five years.

Victoria Jubilee Bridge Approaches, Etc.—Plans are under consideration by the Montreal city council for the enlargement of the yards at Point St. Charles, for which purpose it is necessary to rearrange the approaches to the Victoria Jubilee bridge. The City Engineer was directed to examine the plans and report fully.

We are advised that a contract has been let to the John S. Metcalf Co., Montreal, for a freight warehouse at the corner of Wellington and Bridge streets, Point St. Charles, Montreal. It will be 1,200 by 60 ft., concrete foundations, with brick walls and steel posts, wooden doors and roof.

Prescott, Ont.—The ratepayers of Prescott, passed a bylaw, Sept. 23, conferring an agreement between the town council and the company, for the establishment of divisional terminal facilities. Under the agreement the land owned by the company will be assessed at $16,000 a year for 25 years, and the town will provide $35,000 for the settlement of land damages, etc. The company agrees within two years to lay out terminal yards, and erect a roundhouse, repair shop and other buildings at a cost of not less than $150,000.

Diversion Near Bracebridge, Ont.—The Board of Railway Commissioners has approved of revised location plans for the line in the vicinity of Moore's crossing, near Bracebridge, Ont.

King St. Subway, Toronto.—Plans are under consideration for the reconstruction of the bridge across King street west. It is proposed to remove the present stone pillars in the centre of the roadway, replacing them by steel, and to increase the headway to 14 ft. The city council has the plans under consideration, and it is suggested that the headway might be increased to 18 ft.

Hensall, Ont., Yards.—Plans have been approved by the Board of Railway Commissioners for the rearrangement of the yards, and the building of a new station.

Port Burwell to London, Ont.—Construction is in progress at Port Burwell, Ont., on a line to Aylmer, and engineers are reported to be in the field locating a route from Aylmer to London. Press reports state that construction will be pushed so as to have the line completed to London within a year. (Sept., pg. 448.)

Grand Trunk Pacific Railway Annual Meeting.

A. W. Smithers, of London, Eng., Chairman of the Board, presided at the annual meeting in Montreal, Sept. 18. Good progress was reported on the construction of the main line, as well as on branch lines, the latter comprising approximately 2,000 miles, which the company has at present under construction in Manitoba, Saskatchewan and Alberta, which make connection at many different points with the main line. Track-laying on the main line to the Pacific Coast has reached mile 1,100 west of Winnipeg and beyond the Rocky Mountains. Track laying from the Pacific Coast at Prince Rupert easterly has reached mile 176 at Hazelton, B.C. This leaves a section to be constructed of about 460 miles, which, however, is all under contract, and the work is being carried to completion as rapidly as the character of the country and the labor supply will permit.

Following is the board as constituted for the current year: President, E. J. Chamberlin; other directors, A. W. Smithers, Sir Henry M. Jackson, Sir Felix Schuster, Sir Wm. Henry White, W. Wainwright, M. M. Reynolds, E. H. Fitzhugh, W. H. Biggar, E. B. Greenshields, Hon. R. Dandurand, W. M. Macpherson, Hon. G. A. Cox, E. R. Wood and J. R. Booth.

Jules Hone is also a director, appointed by the Dominion Government under the agreement with the company respecting the construction of the eastern division. The newly elected directors are Sir Felix Schuster and Sir Wm. Henry White, who are directors of the G.T.R. Co., and serve in their turn on the G.T. Pacific board.

Ore Shipments from Fort William.—The Northern Pyrites Mining Co., which is located near Fort William, Ont., is said to be negotiating for special arrangements with the Grand Trunk Pacific Ry. for the shipment of large quantities of pyrites ore in the near future. The proposed arrangements would necessitate the construction of ore docks and other ore handling facilities at Fort William.

A Montreal press dispatch towards the end of September, stated that the C.P.R. had placed an order with the Montreal Locomotive Works, for 125 locomotives, but up to the time of going to press we were unable to obtain any confirmation of this.

Canadian Pacific Railway, Construction, Betterments, Etc.

Second Track Work at St. John's, Que.—We are officially advised that the second track work between St. John's and Highlands, Que., 22 miles, is well on to completion. The application made to the Board of Railway Commissioners was for approval of plans for a second track from mileage 17.35 Farnham subdivision, a point between St. Gregoire and Iberville jct., but the plans submitted therewith only covered the work from the eastern end of the yards at St. John's. It is likely that the second track work will be continued easterly from St. John's to Farnham, next year, but plans for this work have not yet been approved. When undertaken the work will be covered by a new application to the Board. J. M. H. Fairbairn, Assistant Chief Engineer, Montreal, has charge of the work.

The Board of Railway Commissioners has authorized the opening for traffic of the portion of the second track from L'Acadie to north of diamond crossing G.T.R. at St. John's, Que., 3.60 miles.

Campbellford, Lake Ontario and Western Ry.—The following assistant engineers have been appointed in charge of 40 mile districts under the Engineer of Construction, C. W. P. Ramsey, viz.:—C. Luseombe, Parham station; W. H. McGaan, Belleville; G. R. Balloch, Cobourg; E. Duncan, Newcastle; H. H. Charles, Agincourt.

The Board of Railway Commissioners has approved of location plan for the line from mileage 125.5 to 127.32, west of Glen Tay, and of plan for a subway on road allowance between lots 8 and 9, Scarboro tp., Ont.

The following subcontracts have been let for grading, etc., on the line:—Mileage 41 to 43, Taylor and Thom, Enterprise, Ont.; mileage 46 to 51, P. McCoy, Croydon, Ont.; mileage 51 to 56, Irvine and Morrison, Roblin, Ont.; mile 69, A. McDonald, Shannonville, Ont.; mileage 70 to 82, Mulhern and Barrett, Shannonville, Ont.; mileage 82 to 84, McRae and Campeign, Bayside, Ont.; mileage 84 to 88, F. R. Welford, Belleville, Ont.; mileage 88 to 91, Deeks and Hinds, Belleville; mileage 91 to 105, F. R. Welford; mileage 107 to 110, E. P. Creswell, Colborne, Ont.; mileage 115 to 123, Chisholm and Morley, Cobourg, Ont. The subcontract for concrete work from mileage 40 to 55, has been let to Campbell and Lathmore, Perth, Ont.; mileage 55 to 80, to the Highland Construction Co., Toronto; for all structures mileage 80 to 106, F. R. Welford, and for the Jones creek culvert, to T. Manley and Son, Belleville, Ont.

We are officially advised that the following are sub-contractors on the first 40 miles out of Glen Tay:—Mileage 0 to 6.2, P. McCoy, Kingston, Ont.; mileage 6.2 to 7.5, J. M. Foreman, Perth, Ont.; mileage 7.5 to 8.5, McMartin and Murdock, Perth; mileage 8.5 to 9.0, Shea and Huff, Perth; mileage 9.0 to 11.5, McMartin and Murdock; mileage 11.5 to 15.0, A. and W. D. Wheaton, Amherst, N.S.; mileage 15.0 to 24.8, Toronto Construction Co., general contractors, Belleville, Ont.; mileage 24.8 to 39, Johnson Bros., Belleville; mileage 39.0 to 40.0, White and Scriven, Smith's Falls, Ont.

Toronto Yards.—The retaining wall along Front street, from Bathurst street easterly to Spadina avenue, Toronto, has been finished, and the clearing away of the sloping bank is well advanced. The switch connections are being made with the various tracks, so as to connect with the track on the acquired ground leading to the new yards on the site of the old Government house.

Toronto West Second Track Work.—Work has been restarted on the second track westerly from Toronto, which now terminates west of Islington, Ont. It is said that the line will be at once extended through Cooksville, to Hurontario street—the Port Credit Collingwood road—and that the new track will be connected by a Y with the branch line to the G.T.R. at Mimico yards.

Fordwich, Ont.—The Board of Railway Commissioners has approved of location plan for some improvements at Fordwich, a station on the Teeswater line, and local reports state that surveyors have been at work in the vicinity locating lines to Listowel, and to Blyth, on the Guelph and Goderich Ry.

Chatham to Sarnia, Ont.—Press reports state that surveys have been made for a line from Chatham, via Petrolea, to Sarnia, Ont., and that its construction is under consideration.

In a recent interview the mayor of Sarnia is reported as having stated that he had had a conversation with H. D. Lumsden, M. Can. Soc. C. E., upon railway matters, and he understood that construction would be started almost immediately on a line into Sarnia. Representatives of the Sarnia board of trade have visited Montreal recently in the interests of railway extension, and the mayor added he understood that considerable property had been acquired in the vicinity for railway purposes.

Main Line Location McNab Tp.—The Board of Railway Commissioners has authorized the company to change the location of its main transcontinental line in McNab tp., Ont.

Blind River Bridge.—The Board of Railway Commissioners has authorized the company to rebuild bridge 102.55 over Blind river, Algoma subdivision, Lake Superior division.

Lake Superior Division Second Track.—Some details were given in Canadian Railway and Marine World for July, pg. 349, with reference to the second track work on this division. Considerable progress has been made with this work, which when completed will have a considerable effect in preventing congestion at divisional points, and generally along the line. The pin truss bridge across the Big Pick river, consisting of two 160-ft. spans and two central 180-ft. spans, is being replaced by a plate girder bridge. The central spans are left the same length, but the end ones are divided into two, of 80-ft. span. The Little Pick river bridge, of two 165-ft. pin trusses with shore approaches, is having the two main spans replaced with plate girders of similar span.

It is said that some consideration has been given to a plan for diverting the line from Anglin, 22 miles west of Heron Bay, to the Little Pick river bridge, and running inland along a valley, to get away from the shelve construction along the lake front. Nothing has yet been done in the way of locating a route for such a diversion.

Fort William Improvements.—It is said that a number of additional spur tracks to serve industrial concerns are to be built at once at Fort William, Ont.

Press reports state that the construction now being carried on upon Island no. 1 form part of a large plan for the development of the company's railway and steamship facilities, which is to be carried out during the next five years at a total estimated cost of $10,000,000.

Boissevain to Lauder, Man.—The Board of Railway Commissioners has approved of revised location plans for the projected line from Boissevain to Lauder for 35.29 miles. The line will have a total length of 37 miles, and will extend from Boissevain, where the Great Northern Ry. line to Brandon crosses the C.P.R. Winnipeg-Deloraine-Lyleton line, to Lauder, where a branch runs west to Alida, Sask.

Estevan to Forward, Sask.—The Board of Railway Commissioners has approved of revised location plans for the line from Estevan to Forward, 55 miles.

Hawarden to Floral, Sask.—The Minister of Railways has approved of the route map for a line from Hawarden, 22 miles southeast of Outlook, on the line northwesterly from Moose Jaw, northerly to Floral, 11 miles east of Saskatoon, Sask., 46.8 miles.

Asquith to Conquest, Sask.—The Board of Railway Commissioners has approved of location plans for a line from Asquith, Sask., 24 miles west of Saskatoon, southerly to Conquest, a few miles west of the crossing of the Saskatchewan river at Outlook on the branch northwesterly from Moose Jaw, 35 miles.

Swift Current Southeasterly.—The Board of Railway Commissioners has authorized the opening for traffic of the extension of the Swift Current southeasterly line, from Neville to Vanguard, Sask., mileage 27.5 to 43.6.

Swift Current Westerly.—The Board of Railway Commissioners has approved location of the Swift Current branch, formerly Swift Current to Brooks branch, mileage 0 to 84.98. Brooks is a station on the main transcontinental line, 66 miles west of Medicine Hat, and it is said that the line formerly projected from Swift Current to Brooks, is now to be carried to Bassano, Alta. The line is open for traffic as far as Cabri, and is under contract for 80 miles further. Press reports state that final surveys for the remaining mileage have been completed.

Suffield Southwesterly.—We are advised that this line is under construction for 55 miles in a southwesterly direction from Suffield, Alta. The original contract let to J. G. Hargrave Co., Ltd., called for the building of 30 miles, but this was extended to cover an additional 25 miles. The line traverses the Southern Alberta Land and Irrigation Co.'s lands for 3 miles, and through homestead land for the remaining two miles, terminating in sec. 9, tp. 13, range 17 west of the 4th principal meridian, at Barvey, a post office 25 miles north of Taber. The line runs through uncultivated land, but at its proposed present terminal reaches a good farming country, right through to Carmangay, in which there is considerable settlement. The general contractor has let subcontracts as follows:—Mileage 0 to 1, Morrison and Cusack, Suffield; mileage 1 to 3, C. Chapman, Suffield; mileage 3 to 9, G. H. Webster, Calgary; mileage 9 to 10, W. B. Adams, Okotoks; mileage 10 to 12, Wallace Bros., Carlstadt; mileage 12 to 13, Olson and Nelson, Suffield; mileage 13 to 14, Swanson and Anderson, Suffield; mileage 14 to 15, W. B. Acres, Suffield; mileage 15 to 16, A. Anderson, Suffield; mileage 16 to 22, Higdon and Kerr, Medicine Hat; mileage 22 to 36, E. G. Brandenburg, Suffield; mileage 36 to 38, E. Erickson & Co., Suffield; mileage 38 to 40, H. Mainland, Cayley; mileage 40 to 42, Kelly and Ferris, Taber; mileage 42 to 46, G. H. Webster, Calgary; mileage 46 to 52, F. McCleod, Calgary; mileage 52 to 55, several small pieces and the general contractor's own plant. There is approximately 1,500,000 cubic yards of earthwork in the whole. It is expected to have the work completed this year. There is one moderate sized bridge across the South Saskatchewan river.

Strathcona-Edmonton High Level Bridge.—A contract has been entered into between the C.P.R. as lessees of the Calgary and Edmonton Ry., and the Department of

Railways, under the act granting aid for the construction of certain railways and bridges, for the erection of a bridge across the Saskatchewan river, to connect the line now terminating in Strathcona, with the city of Edmonton, Alta. The construction of this bridge has been going on for some time.

Laggan to Lake Louise, B.C.—The Board of Railway Commissioners has authorized the opening for traffic of the branch line from Laggan to Lake Louise.

Galloway to Waldo Branch.—The Board of Railway Commissioners has authorized the opening for traffic of the final section of this branch, from Caithness to Waldo, B.C. This branch starts from Galloway, on the Crowsnest pass line, and runs into the coal fields at Waldo, near Elko, B.C.

Calgary to Vancouver Second Track.—Press reports have been busy for some time with regard to the surveys being made for the building of a second track from Calgary to Vancouver. The latest is that the work will include the driving of a tunnel from Bear creek, east of the Selkirk summit, to a point east of Glacier station, a distance of eight miles, at a cost of $1,500,000 a mile, and that the tunnel will have a gradient of 1% except for a short distance in the centre where the gradient will be 2%. The same report also states that plans are being prepared for a duplicate of the spiral tunnel at the big hill between Laggan and Field. These are mere rumors, as before anything is decided upon, every possible plan will be investigated.

We are officially advised that a second track is to be built from Ruby creek to Hammond, B.C., 57 miles. The contract for this work is reported to have been let to Grant Smith & Co., Seattle, Wash.

We are officially advised that the first section of the second track work east of Vancouver covers from mileage 106.8 at Hammond pit to mileage 128.7 at the eastern end of Vancouver yards, through which there is already a second track. There are no particular engineering features on this piece of work. Along Burrard inlet, between mileage 110.0 and 128.7, the line originally followed the shore. In making the second track the line has been straightened as much as posible, and the engineers have succeeded in cutting out approximately 225 degrees of curvature in 10 miles. Excavations have been hard pan and cemented gravel, slopes of which have been left practically as rock cuts. A few old slides have been struck, but by draining the land back of the railway it has been possible to stop any movements. With the exception of the bridge across the Pitt river, the bridge work on the section has been of minor importance. Grading is practically complete, steel laying is being proceeded with, and the line is being rock ballasted. It is expected that the work will be completed within three months.

Press reports state that the substructure of the Pitt river bridge is being put in, and that a contract for the superstructure has been let to the Dominion Bridge Co.

H. Vindal, Division Engineer, Vancouver, has charge of the second track construction between Ruby creek and Vancouver.

The Toronto Globe stated recently that the Canadian Northern Ry. had found the operation of the gas electric car on the Quebec & Lake St. John Ry. so satisfactory that it had ordered a number of similar cars. We are officially advised that no further orders have been placed, and it is not likely that any will be before next year, if then. It is possible that one of these cars may be put on the Central Ontario Ry. between Trenton and Picton, Ont., next summer.

Motor Car Being Tested on Schomberg and Aurora Railway.

A Galt, Ont., dispatch to Toronto papers, Sept. 19, stated that a gasoline motor car, built in the United States and imported by the Preston Car and Coach Co., has been operated between Galt, Preston and Berlin on the Galt, Preston and Hespeler Electric Ry., and added that the car had been sold to the Canadian Northern Ry. We are officially advised that the C.N.R. has not bought the car, but that arrangements were made with the Toronto and York Radial Ry. to try it on that company's line between Schomberg and Aurora, which is operated by steam.

The entrances and exits of this car are of the side centre entrance type. The car is double-ended and operated from a cab located in the corner of each end. The propulsion and regulation of the car is extremely unique and simple. The first car of this type manufactured has an engine of the four cylinder, four cycle type, cylinder dimensions 5½ x 6½, develops, approximately, 36 h.p., under 600 r.p.m., and is direct connected to a 20 k.w. compound wound differential pole generator. This combined unit is mounted on a rigid frame work of rectangular form, which is brought up from underneath the truck and mounted on a saddle or spring suspension in such a manner that the movement of the truck imparts but little strain or jar to the power plant. This method of suspension appears to be practicable, and, from an operating point of view, is satisfactory as to change or repair of equipment. The motors of this car are of the compound wound type, having a heavy series winding and are of approximately 25 h.p. each and are geared to the axle in the usual manner. These motors are so connected to the generator that it makes a very flexible unit and entirely eliminates the resistance, controller and cable methods. The connection between the generator and motors is such that as soon as the gas engine is accelerated the shunt fields of the motors are pre-energized before the armature circuits of the motors are closed. This gives a cushioning effect upon the motors without resistance, which is unattainable under the ordinary methods, and also gives a combination of units which, to a great degree, protects itself from the misuse of the operator. The later cars built, including the one being tried on the Schomberg and Aurora Ry., have 6 cylinders, 54 h.p. engine, 30 k.w. generator and two 25 h.p. motors, the selling price in the U.S. being about $11,500.

How to Analyse Railroad Reports.—A book with this title, written by J. Moody, the editor of Moody's Analysis of Railroad Investments, has been issued by the Analysis Publishing Co., 35 Nassau street, New York, at the net price of $2.50. It is written primarily from the standpoint of the investor in railway stocks, and gives in plain language the significance and meaning of every statement in the reports of railway companies, thereby enabling the investor to draw his own conclusions as to the value of the stock. The breadth of scope of the book is indicated by the fact, that after a general introduction there are chapters dealing with the physical, the income, and the capitalization factors, followed by an outline of uniform accounting requirements for operations of steam railways. The different points raised are illustrated by facts and figures gleaned from the reports of various companies, and Mr. Moody's wide experience in preparing his annual statistical analysis.

Dominion Government Railway to Hudson Bay.

Large quantities of material have been delivered at The Pas, Man., for the steel bridge which Mackenzie, Mann & Co. are building across the Saskatchewan river there for the Dominion Government railway to Hudson Bay. Tenders are being asked for the building of a freight shed at The Pas.

We are officially advised that the contract for the building of the 68 miles of line from Thicket portage to Split Lake junction, Man., has been let by the Department of Railways to J. D. McArthur, Winnipeg, who also has the contract for the building of the line from The Pas to Thicket portage, 185.5 miles.

Tenders were received to Sept. 12 for the completion of the line to Hudson Bay, either to Port Nelson, 165 miles, or to Fort Churchill, 245 miles from Split Lake junction. It is said that this contract will also be let to J. D. McArthur.

Hon. F. Cochrane, Minister of Railways, arrived in Sydney, N.S., Sept. 3, by steamship from Hudson Bay, which he reached July 28, having travelled by canoe from The Pas. At Port Nelson and Fort Churchill, he inspected the harbor facilities. We were officially advised, Sept. 18, that the press report that Port Nelson has been selected as the terminal was premature. "It may be," we are informed, "that Nelson will be selected," but no announcement had been made to Sept. 18.

Fifteen buoys and other equipment for aiding navigation at Port Nelson were shipped from Montreal by the s.s. Beothic, Sept. 7.

The Dominion Government has published a sessional return giving copies of all reports, surveys, etc., in connection with the railway to Hudson Bay, the suggested ports at Nelson or Churchill, and the navigation of Hudson straits. These give details of the navigation of the straits and bay, as prevailing during the season of 1911 and recorded by F. Anderson, during the voyages of the straits, and the schooners Clarissa C. Thorney and Burleigh; a report on the harbors at Port Nelson and Fort Churchill, prepared by A. G. Bachand and C. Savery, and H. S. Parizeau and R. Fraser respectively; and three reports by J. Armstrong, Chief Engineer of the railway. Neither of the reports gives any definite opinion as to the length of the navigation season, but they deal generally with the conditions as observed in the straits and bay, and in and around the two harbors. These reports confirm in many respects the observations of previous years as to the varying quantities of ice to be met with, and the difficulties of coming at any certain conclusions as to the period during which navigation may safely be carried on. That these conditions are more favorable some years than others is evidenced by the fact that preliminary reports from the investigating parties taking observations during the present season, indicate unusually bad ice conditions in the straits and bay. It may be gathered from all the reports at present received that the outlook for building up an ocean-carrying trade in and out of the bay, as the result of the building of the railway, is not very encouraging.

The three reports made by Mr. Armstrong set out an alternative plan by which the railway will be rendered a profitable proposition, the country through which it passes developed, and existing ports in Canada benefited. The first is a preliminary report; the second makes a comparison between the cost of building the

line to the two ports, in which it is shown that not only is the Port Nelson route the shorter by 80 miles, but that the country through which it passes is more capable of development, and that one line can be more economically operated. In the third report Mr. Armstrong shows how by linking up Hannah bay on the Quebec side of Hudson bay, by rail with Quebec, a combined rail and water route could be provided which would be shorter than the existing rail and water route via Fort William and the great lakes. At Fort Churchill there is a natural breakwater, but the navigable season is only from four to five months as compared with seven to eight months at Port Nelson. The initial development at Fort Churchill might be less difficult than at Port Nelson, but the latter place offers the best advantages for a development capable of handling from 50,000,000 to 60,000,000 bushels of grain. He concludes by recommending the development of Port Nelson.

In connection with this matter it may be noted that the Dominion Parliament and the Quebec Legislature have granted aid towards the building of a railway from Montreal to the mouth of the Nottaway river, in Hannah bay, and that the North Ry., of which F. H. Clergue is a leading promoter, is making surveys, with a view of starting construction in the spring. The Canadian Northern Ry. interests, through the charter of the James Bay and Eastern Ry. has under construction a line from Roberval, the terminus of the Quebec and Lake St. John Ry., to the mouth of the Nottaway river. It is also intended to extend the Ontario Government line—the Timiskaming and Northern Ontario Ry.—from its present terminus at Cochrane to Port Nelson, for which purpose a 10 mile strip of the territory recently given to Manitoba, with water frontage at Port Nelson, has been reserved to Ontario. This strip is now being selected by J. B. Tyrrell, who was at Port Nelson during the visit there of the Minister of Railways. (Sept., pg. 466.)

C.P.R. Orders for Rails and Fastenings.—During this year the C.P.R. has bought 185,300 tons of steel rails, which, with the fastenings, 14,347 tons, and the tie plates, 6,500 tons, make a total of 206,147 tons. These new rails are chiefly of Canadian make—being the output of the Sault Ste. Marie and the Sydney mills, but small quantities were necessarily bought in the United States. They are nearly all 85 lb. rails, and the average cost is $33 a ton, the whole order aggregating about $7,000,000. When laid, these rails will extend 1,440 miles—practically from Montreal half-way across the continent, or would reach from St. John, N.B., to within a few miles of Port Arthur. To carry them to where they will be needed would require 137 trains—averaging 50 cars to the train—and this line of trains would, if placed one after the other, extend for 50 miles. The new rails will be utilized in the various new lines and extensions of existing ones that the company is building, and in replacing old rails where needed, which in turn will be used for sidings or sent to the scrap heap.

The Union Terminals Co., Winnipeg, has built a dock track for the Lake Superior Shipping Co. there. This is the first track of the kind built in the prairie provinces, and it is expected that others will be added before long.

D. E. Brown and Macaulay, Ltd., have been appointed ticket agents for the Oregon-Washington Rd. and Navigation Co. at Vancouver, B.C. D. E. Brown was formerly General Superintendent, C.P. Trans-Pacific steamship service, there.

National Transcontinental Railway Construction.

The intention, it appears, is to have the steel laid complete from Cochrane, Ont., to Winnipeg this season. R. W. Leonard, Commissioner, is reported as stating that there is an 80 mile gap between these two points. While it is expected to have the steel laid by the end of the season, it is considered doubtful whether one line can be got into such a condition that it will be possible to operate grain carrying trains over it.

The yards at Transcona, Man., have a capacity of 5,000 cars, and this can be increased as occasion requires. The finishing touches are being put to the yards by the J. D. McArthur Co., which has the contract.

Tenders are under consideration for piping systems, pipe tunnels, pipe coverings and wiring ducts required for the car shop plant at the Transcona shops. (Sept., pg. 465.)

Grand Trunk Pacific Railway Construction.

A. W. Smithers, Chairman of the Board, G.T.R., and E. J. Chamberlin, President G.T.R. and G.T.R. Ry., returned to Montreal, Sept. 9, after a trip of inspection over the G.T. Pacific Ry. In an interview Mr. Smithers is reported to have said, that as representing the British investors he was entirely satisfied with the manner in which progress had been made. The great difficulty in connection with the construction was the scarcity of men. The contractors could find work for from 4,000 to 5,000 more than were available. There was ample construction equipment on the ground, and if the men were available there was no doubt that the line through to the coast could be completed by the end of 1913. He was confident, however, that trains would be running through from Montreal to Prince Rupert by the end of 1914.

E. J. Chamberlin is reported to have stated that the line was inspected to the track end at Tete Jaune Cache, and the construction work inspected for some distance beyond. West of Tete Jaune Cache to Fort George, there were 25 steam shovels, 40 locomotives and other necessary equipment in operation. The party then returned to Edmonton, and went to Vancouver via the C.P.R., and on to Prince Rupert by steamship, thence they proceeded by train to the end of steel, 176 miles east of Prince Rupert. The work was so far advanced that it was expected to have the track laid further east to Aldermere, early in December, and to Bulkeley summit before work would be closed down for the season.

Edmonton press dispatches state that the Canadian Stewart Co., Montreal, is preparing to sublet portions of the work on the hotel at Edmonton, which is estimated to cost $1,500,000. The specifications call for 12,000 barrels of cement, 6,000 yards of sand, 10,000 yards of gravel, and 1,500,000 bricks.

Reports from Edmonton, Alta., state that the following sub-contractors are at work between Tete Jaune Cache and Fort George:—Carlton and Co., 25 miles; Griffin and Co., 43 miles; Spend and Co., 25 miles; Simmons and Co., 50 miles. These four contractors are operating 22 steam shovels. Thirty-two large and small steel bridges will be constructed between Resplendant and Fort George. After leaving Tete Jaune Cache the road will cross the Fraser river four times before reaching the fort. The first of these bridges is 47 miles below the present railhead. At the canyon, 65 miles farther west, the survey crosses the river twice within a few miles, recrossing it at the canyon. There is also a bridge at Resplendant, making five spans over the Fraser river. A long bridge will cross the Shuswap river and one must be built over the Ghost river before trains are run into Fort George. Reports from Fort George state that a contract has been let for the clearing of 50 acres on the Nechaco river, Fort George, for yard purposes, and that work was started thereon, Sept. 5.

W. C. C. Mehan, General Superintendent at Prince Rupert, reports that all station buildings on the main line east of that city are completed as far as Van Arsdol. These are at Kaien, Phelan, Sock Eye, Tyee, Manu, Kwinitsa, Salvus, Exsrew, Shames, Amsbury, and Terrace, respectively. A 50,000 gallon permanent water tank has been located at Kwinitsa, at mileage 46, and one at Van Arsdol. New stations are in course of construction at Usk, Pitman, Hallwood and new water tanks at Nichol and Kitwanger. Stations are going up at all permanent sidings and water tanks wherever necessary. Station facilities will be complete to Hazelton shortly after the steel reaches that point. Permanent steel bridges are also complete at mileage 55, Kaitsik river, mileage 92, and Kitsumkalum river. Those still under construction are at mileage 60, Exchomsiks, mileage 87, and Zimquad river.

The Board of Railway Commissioners has authorized the opening of the line for traffic from mileage 100 to 164 east of Prince Rupert, and a later report states that owing to the low level of the water in the Skeena river, special permission has been given to operate trains as far as mileage 176, the Sceley gulch crossing. It is expected that the line will be completed into Haslemere early in October.

GRAND TRUNK PACIFIC RAILWAY BRANCH LINES.

The Board of Railway Commissioners has approved of revised location plans from mileage 12.71 to 18.48, and location plans from mileage 18.48 to 21.86, of the branch line from Harte to Brandon, Man.

The line from Regina to the International boundary near Portal, Sask., 134 miles, has been completed so far as the grading and building of structures is concerned. It was reported that 33 miles of steel had been laid to Aug. 30, and it is expected to have the whole mileage laid and ballasted by Dec. 1. At the International boundary the line will connect with a line of 22 miles, being built northerly from Niobe, N.D., by the Great Northern Ry. It is said that the G.T. Pacific Ry. trains will run through over the G.N. Ry. and its connections to Chicago, Ill., where the G.T.R. will take over the traffic.

The Board of Railway Commissioners has approved of location plans for the branch line from Regina to Moose Jaw, Sask., between mileage 40.01 and 47.74. The Mayor of Moose Jaw was advised by M. Donaldson, Vice President and General Manager, Sept. 3, that the right of way through Moose Jaw was being purchased, and when this had been arranged construction would be continued. The route has been approved by the Board of Railway Commissioners.

The Board of Railway Commissioners has authorized the opening for traffic of a further section of the Young-Prince Albert branch, between mileage 45.5 and 67. This extension carries the branch to Wakaw, Sask., and the remaining 57 miles are under construction.

Plans for the entrance of the branch line from Oban into Battleford, Sask., have been approved by the council. A yard is to be laid out, and the buildings will include a

three-stall engine house, station and freight-shed. An industrial spur track will be laid along the lane between 18th and 19th streets to 2nd avenue.

It is reported that on the branch from Battleford into the Cutknife district considerable progress has been made with grading, and that it is expected to have several miles of steel laid this season.

The Board of Railway Commissioners has approved of location plans for the line in Alberta, between mileage 27.67, at the north line of sec. 8, tp. 20, range 28, west of the 4th meridian, to mileage 111.29, at the west line of the northwest quarter of section 34, tp. 11, range 23, west of the 4th meridian. We are officially advised that the contract for the building of this line—a branch from Calgary to Lethbridge—has not yet been let. (Sept., pg. 465.)

Railway Finance, Meetings, Etc.

Alberta Ry. and Irrigation Co.—A duplicate original mortgage made between the A. Ry. and I. Co., the C.P.R. and the Royal Trust Co., securing an issue of bonds by the first named company, has been deposited with the Secretary of State at Ottawa.

Canadian Northern Ry.—There has been deposited with the Secretary of State at Ottawa an indenture dated June 20, made by the C.N.R. Co. to the National Trust Co. and the British Empire Trust Co. as trustees, and the Province of Alberta, being the first supplementary instrument in respect of an additional line of railway, supplementary to the indenture of June 10, 1909, securing 4% stock and bonds guaranteed by the Province of Alberta.

Canadian Northern Ontario Ry.—The name of the James Bay Ry. Co. has now been dropped, and the property incorporated with that of the C.N.O. Ry. The officers and directors for the current year are:—President, Sir William Mackenzie; Vice President, Sir Donald Mann; Third Vice President, D. B. Hanna; Secretary, W. H. Moore; Treasurer, L. W. Mitchell; other directors, Z. A. Lash, F. Nicholls, R. M. Horne-Payne; Assistant Secretary, R. P. Ormsby.

Duluth, South Shore and Atlantic Ry.—The report for the year ended June 30, shows revenue from transportation, $3,125,853.22; from other than transportation, $26,621.81; total operating revenue, $3,152,475.03; operating expenses, $2,395,160.78; net operating revenue, $757,314.25; net revenue from outside operations, $3,358.32; net revenue, $760,672.57; less taxes accrued, $217,417.86; operating income, $543,254.71; other income, $38,763.99; gross income, $582,018.70; less interest, etc., $943,565.71, thus showing a net loss of $361,547.01. The expenditures on additions and betterments during the year, were $91,528.14.

Massawippi Valley Ry.—The annual meeting was held Sept. 4. The following officers and directors were elected for the current year: President, J. G. Foster, Ottawa, Ont.; Vice President, C. W. Cate, Sherbrooke, Que.; other directors, C. D. White, F. N. McCrea, E. O. Grundy, Sherbrooke, Que.; C. H. Kathan, Rock Island, Que.; J. W. Dunklee, Boston, Mass.; J. H. Williams, Bellows Falls, Vt.; H. E. Folsom, Lyndonville, Vt.

Pere Marquette Rd.—S. M. Felton, Chicago, Ill., has been appointed a receiver, in succession to N. Erb, resigned.

Quebec and Saguenay Ry.—The annual meeting was held at Quebec, Sept. 17, when nothing but routine business was done. Following are the directors and officers for the current year:—President, O. B. Daoust; Vice President, H. G. Matthews, Manager Quebec Ry. Light and Power Co; other directors, Sir Rodolphe Forget, L. G. Morin and L. E. Morin.

Quebec Central Ry.—Gross earnings for June, $153,030.78; expenses, $117,419.85; net earnings, $35,610.93, against $129,359.06 gross earnings; $84,228.34 expenses, $45,130.72 net earnings, for June, 1911. Aggregate gross earnings for 12 months ended June 30, $1,354,811.41; expenses, $943,976.36; net earnings, $410,835.05, against $1,208,948.88 aggregate gross earnings; $820,803.12 expenses; $388,145.76 net earnings for same period 1910-11.

St. Marys and Western Ontario Ry.—The first lease under which this line was operated by the C.P.R. Co., was only a tentative one, on a percentage basis. This has been superseded by a lease for 999 years at a rental equal to the interest on the bonds which have been issued.

Temiscouata Ry.—Profit on operation for June, $8,057.

White Pass and Yukon Route.—W. B. Close, Chicago, Ill., of Close Bros. & Co., who represents the British shareholder, is reported as stating at Vancouver, B.C., Sept. 16, that the company proposes extending its steamboat service down the Yukon river to Fairbanks, Alaska, about 600 miles, and to establish a chain of hotels along the river. He is also reported to have said that there is no truth in the press reports, originating in Alaska, that the company had sold its railway, etc., to the Grand Trunk Pacific Ry. Co.

Wisconsin and Michigan Ry.—The Minneapolis, St. Paul and Sault Ste. Marie Ry. has not, as press reports state, acquired this railway. The line was originally built by J. R. Walsh, passed into the hands of receivers, and was purchased at a mortgage sale some months ago by John Marsh. The W. & M. Ry. operates over 135.7 miles, connecting up Iron Mountain, Peshtigo harbor and other points, and connects with the M. St.P. & S.S.M. Ry. at Peshtigo jct., Mich. It owns nine locomotives, 8 passenger cars, 303 flat cars, 37 box cars and 10 refrigerator cars.

Maintenance of Way by Contract.

Contracting maintenance of way work on railroads is being taken up on a constantly broadening scale by a number of engineering departments in the United States, and is a practice which offers many advantages to the railways and opens an attractive field for contractors. Most new lines are now built under the contract system, and it is being found that the economy of that plan does not necessarily end with the completed roadway, but that much of the annual routine work of upkeep may also be included. Ballasting has been extensively carried out in this way, tie renewals are being taken up, painting of structures has been found to work out favorably, and moving of right of way and work of like character offer further applications of the plan. Such items as these lend themselves readily to performance by contract forces under a railway inspector, who in many cases may be one of the foremen. The experience and records of every railway furnish a basis for specifications and estimates for the work, which should insure not only the desired results for the company, but such favorable working conditions for the contractors as to invite a satisfactory number of bids. With the actual conduct of the work in the hands of contractors, the work of the engineering department is considerably simplified. The organization and maintenance of large temporary forces alone is a considerable tax on that department and is something for which the contractor is often better equipped. The latter must always necessarily have a number of sources of supply developed, and also usually has a fixed following of greater or less extent. The work presents inducements to the contractor because of the absence of elements of great risk which attend much new construction, and also on account of its regularity and the possibility of taking it along with other contracts to balance the year's operations and to keep up the central organization. A consideration from the point of view of the railway, in connection with work done by local contractors, is that a large proportion of the money expended remains in the railway territory to develop it, instead of being carried out to other sections or sent abroad.

Great Northern Railway Lines in Canada.

United States Connections.—We are officially advised that the G.N. Ry. is building a line from Niobe, N.D., for 21 miles to the International boundary, near Minot, where it will connect with the line under construction by the G.T. Pacific Ry. from Regina, Sask. It is expected to have the line completed by Oct. 31. J. J. Hill is reported as having stated in New York that the G.T.P. Ry. will run its own trains to Minot, whence they will be hauled by the G.N. Ry. to Minneapolis and St. Paul, Minn., and thence to Chicago, Ill., by the Chicago, Burlington and Quincy Rd., controlled by the G.N. Ry. and Northern Pacific Ry. The trains will be delivered over to the G.T.R. at Chicago. The line from Niobe to the boundary is being built by A. A. Guthrie & Co.

Vancouver, Victoria and Eastern Ry. and Navigation Co.—The spur line to the cement works at East Princeton, B.C., has been completed, and is in operation.

Tenders are under consideration for the building of 40 miles of line from Coalmount to Coquihalla summit in the Hope mountains. The estimated cost of this piece of line is $1,500,000, and the contract will call for its completion by July, 1913. From near the summit a joint line is to be built to Hope, in conjunction with the Kettle Valley Ry. It has not been arranged which company is to build the line, but whichever it is the other is to have equal operating rights.

The Board of Railway Commissioners has authorized the company to open its line for traffic from Abbotsford easterly to Kilgard.

Considerable trouble is being experienced with a sink hole near Ardley, about five miles east of Vancouver. The trouble was believed to have been remedied, when, on Sept. 4, owing to heavy rains, the track sank about 5 ft. for 300 yards. It is intended to drive piles down to the rock, and to erect a large timber trestle over the soft place.

A proposition is under consideration for building a second track on the line from Vancouver to New Westminster. (Aug., pg. 414.)

The Fort William Dock Co. has completed the erection of another large steel coal handling tower at its dock on the Mission river, Fort William, Ont. The new structure will be able to unload 3,000 tons of coal a day from boats, and is operated by electricity. This addition, which cost $125,000, gives the company a total unloading capacity of 6,000 tons a day.

The C.P.R. has ordered 1,500 standard 40-ton steel frame box cars, from the National Steel Car Co.

Transportation Appointments Throughout Canada.

The information under this head, which is almost entirely gathered from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who may notice any error in our announcements will confer a favor by advising us.

Algoma Central and Hudson Bay Ry.—W. M. HUGILL, heretofore Chief Dispatcher, has been appointed acting Trainmaster and Car Accountant, vice J. W. Herrold, resigned. Office, Tagona, Ont.

E. P. SUGAR, heretofore dispatcher, has been appointed Chief Dispatcher, vice W. M. Hugill, promoted. Office, Sault Ste. Marie, Ont.

W. GOTRO has been appointed dispatcher at Sault Ste. Marie, Ont., vice E. P. Sugar, promoted.

Canadian Northern Ry.—ALAN FRASER, B.A. Sc., has been appointed an assistant engineer on Mackenzie, Mann and Co.'s Toronto staff, his principal work being the design of masonry and steel bridges.

Canadian Pacific Ry.—F. G. MILLEN, heretofore chief clerk, Secretary's office, has been appointed Assistant Treasurer, vice E. Alexander, appointed Assistant Secretary, as announced in our last issue. Office, Montreal.

G. I. EVANS, heretofore Mechanical Engineer, Angus locomotive shops, has been appointed Superintendent of Angus locomotive shops, Montreal, vice H. Osborne, recently appointed Assistant Superintendent of Motive Power.

W. H. WINTERROWD has been appointed Mechanical Engineer, Angus shops, Montreal, vice G. I. Evans, promoted.

A. RUTLEDGE, heretofore Superintendent, Sleeping, Dining and Parlor Cars and News Service, district 1, lines east of Toronto and Sudbury, Ont., has been appoinfed Assistant to General Superintendent, same department. Office, Montreal.

J. B. GRAY, heretofore Assistant Superintendent, Sleeping, Dining and Parlor Cars and News Service, district 1, east of Toronto and Sudbury, Ont., has been appointed Superintendent, same district, vice A. Rutledge, promoted. Office, Glen Yard, Montreal.

F. M. BREEN has been appointed Assistant Superintendent, Sleeping, Dining and Parlor Cars and News Service, district 1, lines east of Toronto and Sudbury, Ont., vice J. B. Gray, promoted. Office, Glen Yard, Montreal.

J. H. HUGHES, heretofore Superintendent, District 3, Lake Superior division, Schreiber, Ont., has been appointed Assistant Superintendent, District 2, Eastern division, vice C. W. Lott, transferred. Office, Smiths Falls, Ont.

L. O. TREMBLAY has been appointed Travelling Passenger Agent, North Bay, Ont., vice J. J. Anderson.

C. W. LOTT, heretofore Chief Dispatcher, district 2, Eastern division, Montreal, has been appointed Assistant Superintendent, district 2, Lake Superior division, Chapleau, Ont., vice E. J. Brien, transferred.

J. H. BROOKS, heretofore acting District Master Mechanic, North Bay, Ont., has been appointed District Master Mechanic, district 2, Lake Superior division, White River, Ont.

A. BROWN has been appointed Locomotive Foreman at Fort William, Ont., vice —. McArthur, transferred.

W. PIMLOTT has been appointed Storekeeper at Fort William, Ont., vice W. Colbourne, resigned.

W. J. FIDLER, heretofore clerk, has been appointed Storekeeper at Kenora, Ont., vice D. S. Schofield, transferred.

P. F. WEISBROD, heretofore Superintendent, district 2, Saskatchewan division, Moose Jaw, has been appointed Trainmaster, district 2, Manitoba division, Winnipeg, vice J. M. McKay, transferred.

J. B. McTAGGART, heretofore Bridge and Building Master, Moose Jaw, Sask., has been appointed Superintendent, district 2, Saskatchewan division, vice P. F. Weisbrod, appointed Trainmaster at Winnipeg. Office, Moose Jaw.

J. BAIRD, heretofore Foreman, Bridge and Building Department, Moose Jaw, Sask., has been appointed Bridge and Building Master there, vice J. B. McTaggart, promoted.

R. COOPER, heretofore Assistant Car Foreman, Moose Jaw, has been appointed Car Foreman there, vice J. B. Shelton, resigned.

A. J. IRONSIDES, heretofore locomotive driver, Saskatoon, Sask., has been appointed District Master Mechanic, district 4, Saskatchewan division, Saskatoon. This is a new position on account of the opening of an additional district.

A. C. HARSHAW, heretofore Trainmaster, Macleod, Alta., has been appointed Superintendent, Calgary Terminals.

W. J. UREN, heretofore Superintendent, district 3, Alberta division, Cranbrook, B.C., has been appointed Superintendent, district 2, Alberta division, vice C. S. Maharg, on leave of absence. Office, Calgary. On Mr. Maharg's return he will be appointed Superintendent, Calgary Terminals, vice A. C. Harshaw, who will take a vacation, after which he will receive another appointment.

G. GLASFORD, heretofore Road Foreman, Calgary, Alta., has been appointed District Master Mechanic, district 2, Alberta division. Office, Calgary.

J. M. McKAY, heretofore Trainmaster, Winnipeg, has been appointed Trainmaster, district 1, British Columbia division, vice H. W. McLeod. Office, Revelstoke.

D. S. SCHOFIELD, heretofore storekeepr at Kenora, Ont., has been appointed storekeeper at Nelson, B.C.

Dominion Atlantic Ry.—J. H. YOULD, heretofore Foreman of Shops, has been appointed Superintendent of Motive Power, vice W. Yould, retired from the service. Office, Kentville, N.S.

Duluth, South Shore and Atlantic Ry.—J. C. BEBB, formerly of the Michigan Central Rd. engineering department, Bay City, Mich., has been appointed office engineer in the bridge department, D.S.S. & A.R., Duluth, Minn., and not Assistant to Chief Engineer, vice N. Cadarette, according to the report mentioned in our last issue.

G. MERCER has been appointed Superintendent of Bridges and Buildings, vice W. M. Noon, resigned. Office, Duluth, Minn.

Grand Trunk Pacific Ry.—S. P. PORTER, formerly Deputy Minister of Railways, Telegraphs and Telephones for Saskatchewan, has been appointed Executive Agent, G.T.P.R. He will make land purchases, do other special work in Saskatchewan, and carry out other duties that may be assigned to him by the Vice President and General Manager. Office, Regina, Sask.

J. ASHCROFT has been appointed Road Foreman, Transcona to Melville and Yorkton branch.

W. E. MOHER bas been appointed Road Foreman, Regina branch and district 3, Melville to Watrous, Sask.

C. D. SMITH has been appointed Road Foreman, from Watrous to Biggar, including Oban-Battleford and Biggar-Calgary branches, reporting to Road Foreman of Locomotives, Wainwright, Alta.

The following agents have been appointed:—G.T.P. Junction, Man., C. W. Jaminette; Kelliher, Sask., H. H. Lyle; Mirror, Alta., J. H. Holman; and stations have been opened, with agents, as follows:—Edenwold, Sask., J. J. Burns; Otthon, Sask., L. Mullins; Bruce, Alta., P. L. Harper; Tete Jaune, B.C., L. C. Pearson.

Grand Trunk Ry.—The following agents have been appointed:—Campbellford, Ont., R. C. Johnston; Bethany, Ont., M. M. Wier; Stoney Point, Ont., J. W. LeGallais; Goldstone, Ont., R. D. Ranney; Noyan Jct., Que., J. S. Chenail; outside agency closed at Arthabaska, Que.

Grand Trunk Ry., Grand Trunk Pacific Ry.—F. W. BERGMAN has been appointed Manager of Hotels, G.T.R. and G.T.P.R., with headquarters for the present at Ottawa. He was on Nov. 15, 1910, appointed Manager of the Chateau Laurier, Ottawa, and in March, 1912, was appointed Manager-in-Chief of Hotels. The present appointment appears therefore to be merely a change of title.

Hudson Bay Ry.—J. V. DILLABOUGH, heretofore office engineer, district F, National Transcontinental Ry., has been appointed office engineer of the Dominion Government railway to Hudson Bay, Winnipeg.

Intercolonial Ry.—B. F. SHORTLEY, heretofore operator and assistant to Terminal Agent, at Montreal, has been appointed Terminal Agent there, vice H. B. Sample, deceased.

Michigan Central Rd.—E. A. WIGREN, heretofore Auditor of Disbursements, has been appointed Assistant Auditor, vice N. B. Ackley, resigned to engage in other business. Office, Detroit, Mich.

R. R. RICHARDS has been appointed Auditor of Disbursements, vice E. A. Wigren, promoted. Office, Detroit, Mich.

F. W. SPARLING has been appointed Assistant Auditor of Disbursements. Office, Detroit, Mich.

Minneapolis, St. Paul and Sault Ste. Marie Ry.—H. B. DIKE, General Solicitor, is reported to have been appointed Assistant to the President, with office at Minneapolis, Minn.

B. NOBLE has been appointed Travelling Passenger Agent, New York City.

H. C. BURNETT, Jr., has been appointed Travelling Freight and Passenger Agent, Edmonton, Alta., vice C. H. Dodd.

National Transcontinental Ry.—W. B. CRONK, formerly Superintendent, G.T. Pacific Ry., Regina, Sask., has been appointed Superintendent of Transportation, National Transcontinental Ry., his immediate jurisdiction being over the Transcona-Superior Jct. section, and it will probably be extended to include other portions of the line as they are put in operation. He will report to the Assistant to the Chairman of the N.T.R. Commission. Office, Winnipeg.

Pere Marquette Rd.—E. N. WELLER has been appointed acting Treasurer for the Receivers, vice J. E. Howard, Secretary and Treasurer, deceased. Office, Detroit, Mich.

Toronto, Hamilton and Buffalo Ry.—H. J. VAN VLECK has been appointed Assistant Auditor, vice N. B. Ackley, resigned to engage in other business. Office, Detroit, Mich.

R. R. RICHARDS has been appointed Auditor of Disbursements, vice E. A. Wigren, appointed Assistant Auditor, Michigan Central Rd. Office, Detroit, Mich.

Wabash Rd.—G. R. LAYHER has been appointed Superintendent of Weighing and Handling of Freight. He will have supervision over the weighing and handling of all freight and will take proper action to enforce the rules relating therto. Superintendents, trainmasters, agents, yardmasters and others are directed to co-operate with him for the purpose of having the rules properly observed. Office, St. Louis, Mo.

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TORONTO, CANADA, OCTOBER, 1912.

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Among the Express Companies.

The Canadian Northern Ex. Co. has opened offices at Fiske, and Blaine Lake, Sask.

J. Richardson has been appointed line auditor, Dominion Ex. Co.'s eastern lines, with territory east of Port Arthur, Ont. Office, Toronto.

M. W. Hastie, heretofore route agent, Dominion Ex. Co., Calgary, Alta., has been appointed superintendent there, with supervision of the offices in Alherta.

L. D. Oakley has been appointed line auditor in charge of the Dominion Ex. Co.'s western lines, covering territory west of and including Port Arthur, Ont. Office, Winnipeg.

The Canadian Northern Ex. Co. has issued its transfer tariff covering points in Ontario, the rates shown on which must be used to compute the through charges on shipments destined to offices of other companies to which through rates have not been furnished, applying only from its offices. Shipments originating at the company's offices must be waybilled through to destination, and routed through the transfer point nearest to, but short of destination, and charges computed in accordance with the rules of Official Express Classification 21.

The express business in the United States has been the subject of a thorough investigation by the Interstate Commerce Commission, and the report of the Commission recently filed will result in marked reductions in express rates and notable changes in methods of conducting business, unless at the hearings, which commence Oct. 9, the express companies are able to show cause why the orders should not go into effect. The rates proposed by the Commission are based on a block or zone system, each block being about 50 miles square and the U. S. containing altogether 950 blocks. The rates are made for packages weighing from 1 to 100 lbs. between each zone and every other zone or block, the rate being the same for all cities within a block. The express companies will be required to publish a directory of express stations, showing the number of the block in which each station is located, and at every station there must be filed a single sheet tariff giving the rates from that station to every one of the 949 other blocks. The sheet must also state the local free delivery limits. For light-weight parcels the proposed reductions are considerable. The Commission will also insist on the most direct routings.

NEW METHOD OF HANDLING PREPAID PARCELS.

The Canadian Ex. Co. has recently adopted throughout its entire system of railway and steamship lines a plan having for its object the prevention of double collection of charges at destination when shipments have already been prepaid, the prevention of overcharges and undercharges, and the elimination of the occurrence of packages going astray or being found over without mark, resulting in delay in delivery and inconvenience and loss to the public. The foundation of this new plan for the correct receiving, billing and handling of shipments is the fact that waybills and package labels of distinctive colors are used. For example, all packages, the charges on which are to be prepaid, will bear a label printed on golden red paper. This served as a warning to all employes that charges are not to be again collected. Where charges are to be collected at destination a white paper label is used; for c.o.d. shipments green paper, and for shipments in bond pink paper labels. Waybills printed on paper of corresponding colors will also similarly distinguish the one class of business from the other. A waybill is made in triplicate for every consignment, one copy which contains full particulars of consignee, address, weight and charges, being pasted on the package; one copy being handed to the train messenger in whose custody the package is forwarded, and one copy retained for office use. For mutual convenience special arrangements are made with large or regular shippers to supply them with labels to be attached to shipments in advance of the call of the driver. Where a consignment consists of a number of packages a special "lot shipment" label is placed upon each package, which gives reference to the entire consignment. This it is expected will prevent packages which are a part of a consignment from going astray, and will go a long way towards removing the difficulty which the public have heretofore experienced. A similar system was put in force by all the express companies in the United States on Sept. 1, but we are officially advised that the Dominion Ex. Co. and the Canadian Northern Ex. Co. have decided not to adopt it at present.

The plan which has been adopted by the companies in the United States is in accordance with an order by the Interstate Commerce Committee, and while the Canadian Ex. Co. is following the same plan the Dominion and Canadian Northern Ex. Co.'s managements are of opinion that it will be subject to some, if not many changes, before it is perfected. In the meantime they prefer not to introduce it, but will promptly adopt any good features that may be developed after it has been tried.

Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time, we wish our readers to distinctly understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

The Brown Hoisting Machinery Co., Cleveland, Ohio, has issued its catalog E, describing and illustrating the Brownhoist grab, slag contractors' grab, drag line and shovel buckets, and various kinds of tubs, showing the various manners in which they are utilized in steam and electric railway, and general contracting work, coaling and other similar plants.

The Detroit Lubricator Co., Detroit, Mich., and Windsor, Ont., has issued a general catalogue of 232 pages, which deals, among many other things, with new locomotive lubricators, with oil control valve, air cylinder lubricators, boiler valves, throttle valves, etc. Complete repair part lists are given for all the company's locomotive lubricators, with instructions for installation, operation and care. While this catalogue is complete in some respects as regards locomotive lubrication, it was impossible, owing to lack of space, to include all the information contained in the company's Bullseye Locomotive Lubricator Catalogue, a new edition of which is on the press.

Anticosti Island Ry.—This line, which runs from Ellis bay for 15 miles into the interior of Anticosti island, Que., has been built by the owner of the island, Henri Menier, of Paris, France, for logging purposes. It is standard gauge and has 4 locomotives, 1 passenger car, 20 dump cars, and 1 steam shovel.

Canadian Northern Railway, Construction, Betterments, Etc.

James Bay and Eastern Ry.—The Board of Railway Commissioners has approved of location plans for a further section of this line, now under construction from Roberval, Que., at the terminus of the Quebec and Lake St. John Ry., between mileage 30.7 and 31.4.

Canadian Northern Quebec Ry.—Application is being made to the Board of Railway Commissioners for approval of location plans for a line from Rawdon to St. Donat, Montcalm county, about 40 miles. Surveys are reported to have been completed for the line from Rawdon through Chertsey, Ste. Emilie and Notre Dame de Mercie.

Montreal Tunnel and Terminal Co.—It was expected, Sept. 12, that the negotiations between the company and the city authorities with respect to the lines between the tunnel portal and the water front would result in an arrangement being arrived at by the end of the month. It is said that the plan will provide for an overhead line from the station at Lagauchetiere street to the water front, as proposed by the company, to be built of steel and concrete, and that the track will be laid in a material which is calculated to reduce the noise of the traffic to a minimum. The overhead construction of the line to the water front, the company's representatives informed the board of control, is an essential part of the plans, as it is intended to carry the line across the river to the south shore at some future time.

It was reported Sept. 19 that boring of the tunnel was progressing at the rate of 20 ft. a day at the back of the mountain and 15 ft. a day on the city side. A 240 ft. shaft is being driven in the vicinity of Maplewood Ave., Westmount, and as soon as this has reached the level it will be possible to have four gangs at work driving the tunnel. It is expected that 20 ft. a day will be driven by each gang.

Montreal-Ottawa-Port Arthur Line.—The Minister of Railways has approved general route map for the C.N. Ontario Ry. lines on Montreal Island, 17 miles in length. These lines will form part of the through line, the Montreal-Hawkesbury section of which is under construction.

The taxpayers of Pembroke, Ont., have passed a bylaw granting $25,000 cash bonus, free water and exemption from certain taxes, in return for which the town will be made a divisional point on the line.

The Board of Railway Commissioners has approved of revised location plans for the line through Westmeath and Pembroke tps.; through White, Fitzgerald, Deacon, Lister and Boyd tps., mileage 265.34 to 285.53 from Montreal; through Boyd and Pentland tps; southerly from Capreol Jct.; through Alice and Fraser tps.; through unsurveyed territory Algoma district, mileage 268.03 to 269.3, and mileage 271.53 to 274.16 from Port Arthur.

Canadian Northern Ontario Ry.—The Board of Railway Commissioners has approved of revised location of the line in Camden tp., and has authorized the operation of traffic between mileage 145.83 and 149 and between mileage 152.13 and 152.72.

Plans have been filed with the Toronto city authorities showing how it is proposed to connect the Toronto-Ottawa line and the Toronto-Sudbury line with the new union station in North Toronto. The plans include provision for a new joint station about 2.5 miles east of Leaside Junction, and a steel girder bridge which will carry the Ottawa-Toronto line connection over the Don river.

The C.N.O.R. and the C.P.R. trains will run east together from North Toronto station as far as the west Don river, which will be crossed by means of the present bridge, which is to be double-tracked. Immediately east of this the C.N.O. Ry. will deviate, and its own tracks will branch out, that to the north passing under the C.P.R. tracks about 200 yards to the west of the C.P.R. Don bridge, and then connect with the existing line where it emerges over the Don valley, while the Ottawa-Toronto line will run easterly, crossing the Don river on a steel girder bridge about 500 yards farther down the river than that of the C.P.R., after which the line will run out towards the present line, connecting with it in close proximity to the G.T.R. Scarboro Junction station.

In connection with the line west of Toronto it is reported that contracts will be let for the section from Toronto to Hamilton at an early date, and that grading will be completed this year from Poplar Plains road, North Toronto, to the west side of the Humber river at Lambton. The final questions in connection with the route to and through Hamilton are being rapidly settled, and there is little doubt, Hamilton city officials state, that contracts will shortly be let for the work. As to the company's construction intentions from the Niagara peninsula westerly to Windsor and Sarnia, there are numerous rumors. While the company has engineers in the field looking over routes, nothing definite has been decided as to what lines to build or what places they will serve, except that a line will be built from the vicinity of Hamilton via Brantford and London. Sir Wm. Mackenzie is reported as stating that the Toronto-Hamilton line will be started soon, and that it will be pushed forward towards Niagara Falls in the spring, that the surveys have all been completed and that construction will be rushed. He added that the company has not been purchasing land at Windsor for terminal purposes, as the question of extending the lines to Detroit is a question for the future and has not yet been given consideration.

Canadian Northern Ry.—Speaking of the plans for the cut-off across Winnipeg, to which considerable opposition has developed, Sir Wm. Mackenzie is reported to have stated, Sept. 5, that the route proposed is the best that can be adopted from a railway point of view, and that the company is not considering any alternative route.

Satisfactory progress is reported to have been made with construction on the line alone the east shore of Lake Winnipeg. A train service has been put on the line as far as Inwood, on the western side of the lake, about 45 miles from Grose Isle, Man. This line, it is reported, is to be extended at an early date for a further distance of 45 miles. Press reports state that the lines on both sides of the lake are to be continued until they effect a junction at the head of the lake, when it will be decided whether an extension to Hudson bay is desirable or not.

Plans are reported to have been prepared showing considerable alterations and improvements to the station and freight sheds at Brandon, Man.

General Manager and Chief Engineer M. H. MacLeod has informed the mayor of Moose Jaw, Sask., that instructions have been given to have the line completed into that place as soon as possible.

The Board of Railway Commissioners has approved of location plans for the C.N.R. through tps. 22-19, range 29-28, west of the 4th meridian, mileage 13.21 to mileage 31.40; and through tps. 19-15, range 29-26, west of the 4th meridian, mileage 31.40 to 65.05.

Sir Wm. Mackenzie is reported to have stated in Calgary, Alta., Sept. 3, that he expected track would be laid into that city by Nov. 15. The grading was completed right into the city, and the track-laying gang had got to within 57 miles of the city. The line is coming in on the Second street west side of the south end. Sir William added that a large dead-end station would be built.

The Board of Railway Commissioners has approved of the station site and track layout at Calgary. Plans of the several buildings proposed to be erected have been submitted to the Calgary city council. Press reports state that a contract has been let to John Gunn and Sons, Winnipeg, for the building of the superstructure of a bridge across the Bow river in Calgary.

We are officially advised that a contract has been let to the Northern Construction Co. for the building of the Calgary-Macleod branch. The Board of Railway Commissioners has approved location plans for the line through Macleod, mileage 102.05 to 104.26.

Grading is being proceeded with on the line from Oliver to St. Paul de Metis, about 11 miles being practically ready for the track. It is expected to have 20 miles graded by the end of the season.

Another branch line out of Edmonton, on which grading is being done, starts from Onoway in the direction of the Peace river. The right of way is cleared to the crossing of the Athabasca river, and it is expected to have track laid to Whitecourt, 32 miles from Onoway, by the end of the year.

The Board of Railway Commissioners has authorized the opening for traffic of the line from Morinville to Athabasca Landing, Alta., 72 miles, and a train service was put in operation Sept. 2.

West of Edmonton to the British Columbia boundary, grading has been completed to Hinton, 175 miles west of Edmonton, and track has been laid to Entwistle. The superstructure of the high level bridge across the Pembina river is expected to be completed early in October, when the bridge building gang will move on to the McLeod river crossing. It is expected that steel will be laid to that point by the end of the year. Two-thirds of the grading has been done between Hinton and Fiddle creek, 40 miles, and work is in progress on the 50 miles from Fiddle creek to the summit. It is expected that track will be laid to the summit by May, 1913.

Canadian Northern Pacific Ry.—A contract has been entered into between the company and the Department of Railways, under the act passed last session of the Dominion Parliament, granting aid for the construction of a line from the Yellowhead pass to the mouth of the Fraser river, B.C., 525 miles.

C. V. Cummings, Secretary-Treasurer, Northern Construction Co., is reported as stating in Edmonton, Alta., Sept. 10, that all contracts had been awarded in connection with the building of the main line between Edmonton and the Pacific coast. Grading is expected to be completed as far west as Kamloops by the end of 1913.

Among the contractors reported to be at work on sections of the line, under the general contractors, are:—Phelan and Shirley, Palmer Bros., and Henning, Vancouver; J. Hogan, Edmonton, Alta.; Twohy Bros., McDonald Bros., Boyd and Craig, Murdoch and Co.

We are officially advised that the surveys for the location of the branch line from near Kamloops to the Okanagan valley are being rapidly pushed forward, and it is expected to have the route settled at an early date. Contractors have been looking over the approximate route with a view to tendering.

Rapid progress is being made with construction in Yale district. The 2,108 ft. tunnel near Yale is expected to be completed early in October. The contract for eight bridges and trestles, east of Yale, Rigby and Marsden, Vancouver, has been cancelled, and the work entrusted to Boyles and Co., Vancouver. It is expected that the steel will be laid to Yale by the end of the year.

There have been considerable negotiations between the company's officials and the Vancouver city council as to the location of terminals there. At a meeting of the city council, Aug. 29, a letter was read from A. D. Davidson, Land Commissioner, in which the city was asked to transfer in fee simple the balance of the False creek flats and the lots in connection with which a bylaw was passed, for $600,000; the company to reimburse the city for the amount spent in connection with the site, this not to exceed $600,000; also to fill in the flats; build a seawall on the west side of Main street bridge; waive to the city a strip of land 1,600 ft. from north to south, and 150 ft. from east to west, east of Main street bridge; give the city three streets 100 ft. each in width through the property; spend a minimum of $4,000,000 on the property; erect a union station at a cost of $1,500,000; begin work within 90 days of consent and complete it within five years; grant permission to other railways to use the station on a 5% car basis; build a double track tunnel about four miles long under the city, at a cost of about $1,000,000 a mile, the same to be operated by electricity; use electricity for operating the yards, and give a suburban service between Vancouver, New Westminster and Port Mann. The proposed agreement has been discussed at length, and several alterations made, and it was reported, Sept. 17, that terms have been all but definitely settled. Vancouver is to be the passenger terminal of the line, with local freight yards, the available room in the False creek bed being 120 acres, and Port Mann will be the freight terminal. Vancouver is to be the location of private industries, while the repair shops, roundhouses, etc., will be at Port Mann. The Vancouver city terminal is to be reached by a tunnel. The estimated cost of the various works in Vancouver is put at $10,000,000, and it is said it is to be completed in three years, instead of five, as originally proposed.

Vancouver Island Lines.—We are officially advised that a contract has been let to the Northern Construction Co. for the building of a 40 mile section of the line on Vancouver Island, starting about five miles east of Cowichan lake, mileage 100, and extending to about two miles south of Port Alberni, mileage 140. The route crosses the divide west of Cowichan lake, and descends to Nitinat river, crossing that river about three miles north of Nitinat Lake. It then runs up the Little Nitinat river, and along the Francis and Darlington lakes, then down Coleman Creek to about three miles from the Alberni canal, from which it swings easterly and descends on a maximum gradient of 1.5% to the canal, which is followed past Franklin and China creeks to mileage 140, about two miles south of Port Alberni. The character of the country is generally very rough and expensive for railway construction. The maximum gradient is 1.5%, and the maximum curvature 12 degrees. There will be no bridges of importance, except those at the crossings of the Nitinat river, Franklin and China creeks, not yet decided upon. S. O. Lewis, Victoria, B.C., is District Engineer.

The location surveys for the extension of the line from near Alberni, across the summit to the Campbell river district, have, we are officially advised, been completed. The route is subject to alteration on revision. Engineering parties are in the field looking for a satisfactory route to the upper end of Vancouver island.

Canadian North Eastern Ry.—J. F. Ross and H. Hornberg, recently arrived in Stewart, B.C., and are engaged in making a topographical survey of the country from the present end of steel of the C.N.E. Ry. through the Groundhog coal district to Redcliff and the Dominion Government telegraph line, with a view of deciding upon a route for the extension of the line.

Railway Rolling Stock Notes.

The International Ry. of New Brunswick has ordered 20 logging cars from the Canadian Car and Foundry Co.

The G.T.R. has ordered 2,000 box cars from the Pressed Steel Car Co., and 50 tank cars from the American Car and Foundry Co., for use on the Grand Trunk Western Ry., west of the St. Clair and Detroit rivers.

The G.T. Pacific Ry. has received seven ballast cars, nos. 392993 to 392999, from the Canadian Car and Foundry Co., Montreal; and two flat cars, nos. 361898 to 361899, from the American Car and Foundry Co., thus completing both orders for ballast cars and flat cars, respectively.

The G.T.R. has ordered 25 superheater mikado freight locomotives from the American Locomotive Co., to be built at Schenectady, N.Y. These will be of the 2-8-2 S. type, with cylinders 27 ins. diar. by 30 ins. stroke; driving wheels 63 ins. diar., and total weight in working order, 276,000 lbs.

The Intercolonial Ry. has ordered four switching and five consolidation locomotives from the Canadian Locomotive Co., and five consolidated locomotives from the Montreal Locomotive Works; and has received 20 flat cars from the Nova Scotia Car Works, Halifax, N.S., and two box cars from the Rathbun Co.

It is reported that the Montreal Harbor Commissioners will shortly place orders for 12 electric motors and a large quantity of rolling stock for the harbor railway system, which, it is said, is to be electrified. We are officially advised that no such orders have been placed, nor is it likely they will be placed in the immediate future; also that though electrification may take place, nothing is, at present, in contemplation.

The Central Ontario Ry. has received 25 ore cars; the Canadian Northern Ontario Ry., 50 coal cars; the Halifax and South Western Ry., 6 excursion cars; the Niagara, St. Catharines and Toronto Ry., 10 coal cars; the Canadian Northern Quebec Ry., 50 coal cars, 50 flat cars and 6 excursion cars, and the Brockville, Westport and North Western Ry., 2 first class cars and 1 combination car, from J. T. Gardner, Chicago, Ill.

The Canadian Northern Ry., between Aug. 15 and Sept. 15, ordered the following rolling stock:—5 first class cars, from the Canadian Car and Foundry Co., Montreal; 25 consolidation locomotives, and 20 switching locomotives, from the Canadian Locomotive Co., Kingston, Ont.; 25 cabooses, from its Winnipeg shops; 2 mogul locomotives, from J. T. Gardner, Chicago, Ill.; and 10 tank cars and two 60 ton wrecking cranes in the U.S.

The G.T.R. has made the following additions to rolling stock:—three baggage cars, from its Montreal shops, making 13 out of 20 ordered Mar. 31, 1911; 45 refrigerator cars, and 124 box cars, from the Canadian Car and Foundry Co.; 93 automobile cars, completing order for 250, Jan. 23, and 50 tank cars, from the American Car and Foundry Co., 341 box cars, from the Western Steel Car and Foundry Co.; and 512 steel coal cars, from the Pressed Steel Car Co.

E. J. Chamberlin, President, G.T.R. and G.T.P.R., while in Vancouver, recently, is reported to have stated that it had been definitely decided to use oil fuel on the locomotives on the Mountain section, not only because it was safer, but because it was cheaper, the company being in possession of large areas of oil lands, which would give it a perpetual supply. We are officially advised that though no arrangements have been made for using oil on the Mountain division, the matter is under consideration.

The C.P.R., between Aug. 15 and Sept. 15, received the following additions to rolling stock:—18 freight refrigerator cars, 64 vans, 627 wooden box cars, 209 steel frame box cars, 1 pile driver, 2 ballast spreaders, 8 locomotives, class P.1, 1 colonist car, 6 baggage and express cars, 4 mail and express cars, 1 box baggage car, 1 baggage and smoking car, from its Angus shops, Montreal; 339 steel frame box cars, 250 ballast cars, from the Canadian Car and Foundry Co.; 15 locomotives, class D.10, from the Montreal Locomotive Works; 12 stone cars, from the Nova Scotia Car Works; and 48 steel frame box cars from the U.S.

The Canadian Northern Ry., between Aug. 15 and Sept. 15, received the following additions to rolling stock:—154 box cars, 1 first class car, 1 second class car, 1 dining car and 5 baggage cars, from the Canadian Car and Foundry Co.; 2 passenger and mail cars, and 1 combination car, from the Preston Car and Coach Co.; 2 cafe-parlor cars, from J. T. Gardner, Chicago, Ill.; 65 box cars and 4 baggage and mail cars, from the Crossen Car Co.; 57 box cars, from the Nova Scotia Car Works; 2 consolidation locomotives from the Canada Foundry Co.; 8 consolidation locomotives from the Canadian Locomotive Co.; and 60 flat cars from the Rathbun Co.

The two dining cars, which the C.P.R. is building at its Angus shops, Montreal, will be of an entirely new floor plan. The dining room will be 38 ft. 4 ins. long, and will contain 6 tables with a seating capacity of 24, and 6 tables with seating capacity of 12. The larger tables will be 4 ft. wide and the space over the seats will be 6 ft. 4 ins., except the two end tables, where it will be 6½ ft. in each case. The smaller tables will be 2 ft. 9 ins. wide, and the aisle 2 ft. 2 ins. wide. The lighting will be by three 5-cluster lights down the centre, and 12 single globes down each side. The kitchen and pantry, etc., will occupy 33 ft. 9 ins., the refrigerator being at the rear, and arranged to be filled from the roof.

The C.P.R., between Aug. 15 and Sept. 15, ordered the following rolling stock:—1 stores supply car, 25 vans, 5 push snow ploughs, 13 flangers, 2 dining cars, 8 buffet-parlor cars, 2 compartment sleeping cars, 12 observation cars, 10 second class cars, 4 first class smoking cars, 4 first class and smoking cars, 62 suburban cars, 7 mail and express cars, 50 box baggage cars, 14 first class cars, 40 baggage and express cars, 22 tourist cars, 14 sleeping cars, 1,000 steel frame box cars, 2,000 wooden box cars, 2 locomotives, class E.2, 30 locomotives, class U.3, 5 locomotives, class D.4, from its Angus shops, Montreal; 1 steel snow plough, 5,900 steel frame box cars and 100 automobile cars, from the Canadian Car and Foundry Co.; 25 locomotives, class D.10, from the Canadian Locomotive Co.; 500 steel frame box cars, from the Nova Scotia Car Works;

and 1,500 steel frame box cars, from the National Steel Car Co.

Following are chief details of the five consolidation superheater locomotives which the Intercolonial Ry. has ordered from the Montreal Locomotive Works:—

Cylinders, diar. and stroke	22 by 28 ins.
Driving wheels, diar.	56 ins.
Wbeel base, rigid	15 ft. 10 ins.
Wheel base, engine, total	24 ft. 4½ ins.
Wheel base, engine and tender, total	56 ft. 6½ ins.
Weight of engine in working order	200,000 lbs.
Weight on driving wheels	175,000 lbs.
Weight of tender	150,000 lbs.
Boiler, type	Extended wagon top
Boiler, outside diar. front end	70½ ins.
Boiler pressure	200 lbs.
Tubes, no. and diar.	242—2 ins.
Flues, no. and diar.	24—5 ins.
Tubes, length	14 ft. 2½ ins.
Superheater, type	Schmidt
Tank capacity, water	6,500 imp. gals.
Tank capacity, coal	12 tons
Maximum tractive power	41,100 lbs.

The 25 consolidation locomotives which the Canadian Northern Ry. is having built by the Canada Foundry Co., Toronto, as announced in our last issue, will be of the same general type as those previously built by the same company, of which we have already given details in previous issues. Following are the main details:—

Cylinders, diar. and stroke	24 by 32 ins.
Driving wheels, diar.	63 ins.
Boiler pressure	180 lbs.
Tractive effort, maximum	45,000 lbs.
Firebox, length and width	110 by 64 ins.
Grate area	49 sq. ft.
Tubes, no. and diar.	272—2 ins.
Flues, no. and diar.	30—5 ins.
Boiler, diar.	72 and 79 ins.
Heating surface, total	2,811 sq. ft.
Weight on drivers	206,000 lbs.
Weight of engine, total	236,000 lbs.
Height, top of rail to top of stack	15 ft., 3 ins.
Driving wheel base	16 ft., 6 ins.
Tender, type	Eight wheel
Capacity, water	6,000 imp. gals.
Capacity, coal	10 tons

Following are chief details of the 4 six consolidation freight locomotives which the Intercolonial Ry. is having built by the Canadian Locomotive Co.:—

Weight in working order on drivers,	175,000 lbs.
Weight in working order, total	200,000 lbs.
Wheel base of engine, rigid	15 ft. 10 ins.
Wheel base of engine, total	24 ft. 4½ ins.
Heating surface, firebox	161 sq. ft.
Heating surface, tubes	2,122 sq. ft.
Heating surface, total	2,283 sq. ft.
Driving wheels, diar.	56 ins.
Driving wheel centres	Cast steel
Driving journals	9½ and 9 by 12 ins.
Cylinders, diar. and stroke	22 by 28 ins.
Boiler, type	Radial stayed
Boiler pressure	200 lbs.
Tubes, no. and diar.	206—2 ins.; 28—5⅜ ins.
Tubes, length	14 ft. 2 ins.
Brakes	Westinghouse, American
Superheater	Schmidt type A
Weight of tender, loaded	150,000 lbs.
Capacity, water	6,500 imp. gals.
Capacity, coal	12 tons
Tank, type	Water bottom
Truck, type	Outside equalized
Wheels, diar.	34 ins.
Wheel, type	Wrought iron, steel tired
Journals	5½ by 19 ins.
Brake beams	Simplex high speed

Following are chief details of the 25 consolidation superheater locomotives which the Canadian Northern Ry. is having built by the Canadian Locomotive Co:—

Weight on drivers	163,000 lbs.
Weight of engine, total	188,000 lbs.
Wheel base, rigid	15 ft. 6 ins.
Wheel base of engine, total	23 ft. 9 ins.
Heating surface, firebox	179 sq. ft.
Heating surface, tubes	1,772 sq. ft.
Heating snrface, total	1,921 sq. ft.
Driving wheels, diar.	57 ins.
Driving wbeel centres	Cast steel
Driving journals	9½ and 9 by 12 ins.
Cylinders, diar. and stroke	23 by 26 ins.
Boiler, type	Radial stayed
Boiler, pressure	170 lbs.
Tubes, no. and diar.	179—2 ins.; 24—5⅜ ins.
Tubes, length	14 ft.
Injectors	Obio
Brakes	Westinghouse American
Superbeater	Schmidt type A
Weight of tender, loaded	144,000 lbs.
Capacity, water	6,000 imp. gals.
Capacity, coal	12 tons
Tank, type	Water bottom
Truck, type	Four wheel equalized
Wheel, diar. and type	33 ins. steel tired
Journals	5½ by 10 ins.
Brake beams	Simplex

Following are chief details of the 20 six wheel switching locomotives which the Canadian Northern Ry. is having built by the Canadian Locomotive Co.:—

Weight, total	123,000 lbs.
Wheel base of engine	11 ft.
Wheel base, engine and tender	39 ft. 1 in.
Heating surface, firebox	131 sq. ft.
Heating surface, tubes	1,206 sq. ft.
Heating surface, total	1,337 sq. ft.
Driving wheels, diar.	50 ins.
Driving wheel centres	Cast iron
Driving journals	8½ by 10 ins.
Cylinders, diar. and stroke	19 by 26 ins.
Boiler, type	Radial stayed
Boiler pressure	180 lbs.
Tubes, no. and diar.	223—2 ins.
Tubes, length	10 ft. 5 ins.
Brakes	Westinghouse American
Weight of tender, loaded	86,000 lbs.
Capacity, water	3,500 imp. gals.
Capacity, coal	5 tons
Tank, type	Sloping back
Truck, type	Arch bar with steel bolsters
Wheels, diar.	33 ins.
Wheels, type	Wrought iron, steel tired
Journals	4¼ by 8 ins.
Brake beams	Steel trussed

Following are chief details of the six coupled switching locomotives which the Intercolonial Ry. is having built by the Canadian Locomotive Co.:—

Weight, total	138,000 lbs.
Wheel base of engine	12 ft.
Wheel base, engine and tender	40 ft. 5¼ ins.
Heating surface, firebox	132 sq. ft.
Heating surface, tubes	1,935 sq. ft.
Heating surface, total	2,067 sq. ft.
Grate area	27.5 sq. ft.
Driving wheels, diar.	51 ins.
Driving wheel centres	Cast iron
Driving journals	8½ by 11 ins.
Cylinders, diar. and stroke	20 by 26 ins.
Boiler, type	Straight top, radial stayed
Boiler pressure	200 lbs.
Tubes, no. and diar.	300—2 ins.
Tubes, length	12 ft. 6 ins.
Brakes	Westinghouse American
Length over all, engine and tender	55 ft. 4 ins.
Width over all	10 ft.
Height over all	15 ft. 3 ins.
Weight of tender, loaded	90,000 lbs.
Capacity, water	3,800 imp. gals.
Capacity, coal	6 tons
Tank, type	Hopper with sloping back
Truck, type	Four wheel
Wheels, diar.	33 ins.
Wbeels, type	Wrought iron, steel tired
Journals	M.C.B. 4¼ by 8 ins.

Following are chief details of the 25 ten wheel locomotives, class D.10G., which the C.P.R. is having built by the Canadian Locomotive Co.:—

Weight on drivers	141,000 lbs.
Weight, total	190,000 lbs.
Wheel base of engine, rigid	14 ft. 10 ins.
Wheel base of engine, total	26 ft. 1 in.
Wheel base, engine and tender	54 ft. 10¼ ins.
Heating surface, firebox	180 sq. ft.
Heating surface, tubes	2,238 sq. ft.
Heating surface, total	2,418 sq. ft.
Driving wheels, diar.	63 ins.
Driving wheel centres	Cast steel
Driving journals	9½ and 9 by 12 ins.
Cylinders, diar. and stroke	21 by 28 ins.
Boiler, type	Extended wagon top
Boiler pressure	200 lbs.
Tubes, no. and diar.	240—2 ins.; 24—5 ins.
Tubes, lengtb	14 ft. 4 ins.
Brakes	Westinghouse, E.T. 6
Superheater	Vaughan and Horsey
Grate area	49 sq. ft.
Superheater beating surface	408 sq. ft.
Width over all, engine and tender	10 ft.
Height over all	15 ft. 2 ins.
Lengtb over all	65 ft. 9 ins.
Weight of tender, loaded	134,000 lbs.
Capacity, water	5,000 imp. gals.
Capacity, coal	12 tons
Tank, type	Water bottom
Truck, type	Outside equalized
Wheels, diar.	36¼ ins.
Wbeel, type	Cast steel centre witb retaining rings
Brake beams	Simplex

Following are chief details of tbe four Pacific type locomotives, which the Canadian Northern Ry. is having built by the Montreal Locomotive Works, as mentioned in our last issue:—

Weigbt on drivers	136,000 lbs.
Weight of engine, total	213,000 lbs.
Weight of tender	145,000 lbs.
Wheel base, driving	13 ft.
Wheel base, total engine	33 ft., 7 ins.
Wheel base, total engine and tender	68 ft., 5 ins.
Tractive power, maximum	31,100 lbs.
Factor of adhesion	4.37
Cylinders, diar. and stroke	23 by 28 ins.
Valve gear	Walschaert
Valves, diar.	14 ins.
Driving wheels, diar.	69 ins.
Driving journals	9½ and 9 by 12 ins.
Engine truck, type	Four wheel with swing centre
Engine truck journals	5½ by 12 ins.
Engine truck wheels, diar.	33 ins.
Trailing truck, type	Four wheel radial
Trailing truck journals	8 by 14 ins.
Trailing truck wheels	45 ins.
Boiler, type	Extended wagon top, radial stay.
Boiler, outside diar. front end	62 ins.
Boiler, outside largest course	70 ins.
Boiler pressure	170 lbs.
Firebox, length and width	108⅛ by 64¼ ins.
Tubes, no. and diar.	162—2 ins.
Tubes, length	20 ft.
Flues, no. and diar.	24—5 ins.
Heating surface, tubes	2,358 sq. ft.
Heating surface, firebox	160 sq. ft.
Heating surface, total	2,518 sq. ft.
Grate area	48.2 sq. ft.
Tender wheels, diar.	33 ins.
Tender journals	5½ by 10 ins.
Tender truck, type	Four wheel pedestal
Tank, type	Water bottom
Capacity, water	6,000 imp. gals.
Capacity, coal	12 tons.

Minneapolis, St. Paul and Sault Ste. Marie Railway.

The report for the year ended June 30, states that the extension from Frederic to Duluth was completed during the year and traffic is now being handled between the twin cities and Duluth. The line in North Dakota between Drake and Fordville, 130 miles, the construction of which was commenced in 1910 and temporarily discontinued on account of crop failures, was expected to be ready for traffic by Oct. 1. In connection with the new terminals at Chicago, land has been acquired, one block wide on the west side of the Chicago river between Canal and Clinton streets, and extending from 12th street to West 15th place. Contracts have been let for the construction of concrete freight houses. The property is made available by a contract with the Baltimore and Ohio Chicago Terminal Rd., for the use of that company's tracks to a connection with tbe M.St.P. & S.S.M.R. Chicago division. A strip of land one block wide, from Canal to Halstead streets, has been acquired for a connection between the two forementioned tracks, and considerable land has also been acquired at 50th street for yards, etc. The finance report shows gross earnings (including the Cbicago division, formerly Wisconsin Central Ry.), $26,684,240.93; expenses, $16,223,291.02; net earnings, $10,460,949.91; income from other sources, $1,099,019.53; total income, $11,559,969.44, less fixed charges, taxes, etc., $6,831,030.02; surplus income. $4,728,939.42. The average mileage operated was 3,773.37, an increase of 49.03 miles. In connection witb the provision of terminals at Chicago, the company and the Central Terminal Ry. Co. have executed a joint mortgage covering the property and its improvements, providing for a possible issue of $20,000,000 4% gold bonds, of which $6,000,000 have been sold, the proceeds being sufficient to complete the terminals as now planned. To provide funds for the building of the Frederic extension to Duluth, Minn., temporary advances for which had been made from the company's surplus account, $1,520,000 of M.St.P. & S.S.M.R. first mortgage consolidated gold bonds bave been issued, and $1.020,000 of the company's equipment trust notes have also been issued in connection with additional equipment contracted for delivery prior to Sept. 1. To provide for temporary advances made for revision work on the Chicago division, for payment of car trust obligations and retirement of maturing bonds of underlying mortgages of the Wisconsin Central Ry., $3,500,000 of W.C.R. first and refunding mortgage bonds were issued.

Orders by the Board of Railway Commissioners.

Beginning with June, 1904, Canadian Railway and Marine World has published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed our paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates given of orders, immediately following the numbers, are those on which the orders took place, and not those on which the orders were issued. In many cases orders are not issued for a considerable time after the dates assigned to them.

17155. July 31.—Authorizing Esquimalt and Nanaimo Ry. to build bridge 5.2 over Burnside road, near Victoria, B.C.

17156. June 24.—Authorizing C.P.R. to build spur for Jamieson Lime Co., Sand Point, Ont.

17157. July 27.—Authorizing Kettle Valley Ry. to build bridge over Okanagan river at Penticton, B.C.

17158. Aug. 1.—Authorizing Canadian Northern Ry. to cross 68 highways with its Goose Lake extension, Alta.

17159. July 31.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to cross five highways between mileage 126.60 and 155.70, Ont.

17160. July 31. Authorizing G.T.R. to build spur for Dominion Canners, Ltd., Aylmer, Ont.

17161. Aug. 1.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to cross nine highways between mileage 177.86 and 183.45.

17162. Aug. 1.—Authorizing C.P.R. to build spur for Golden West Brewing Co., Titian, Alta.

17163. Aug. 1.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to cross four highways between mileage 121.87 and 124.83, Ont.

17164, 17165. Aug. 1.—Authorizing C.P.R. to build spur for Stag Creek Lumber Co. on its Maniwaki subdivision, Que., and for Carter Mather Lumber and Supply Co., Calgary, Alta.

17166. Aug. 1.—Approving C.N. Ontario Ry. station site at Torbolton.

17167. Aug. 2.—Authorizing Medonte tp., Ont., to build highway crossing over C.P.R. Sudbury-Kleinburg branch.

17168. Aug. 1.—Approving drain plans for Woodworth award drain under G.T.R. in Malahide tp., Ont.

17169. Aug. 2.—Authorizing C.N. Branch Lines Co. to connect its Canora-Sturgis branch with C.N.R. main line at Canora, Sask.

17170. Aug. 1.—Authorizing C.N. Quebec Ry. to build across public road in St. Augustin parish.

17171. Aug. 7.—Approving Canadian Northern Ry. location through tps. 19-15, r. 29-26, w. 4 m., mileage 31.40 to 65.05, Alta.

17172. Aug. 6.—Authorizing C.N. Ontario Ry. to cross two highways on its Ottawa-Capreol line, in Field tp.

17173. Aug. 3.—Authorizing C.P.R. to build spur to its freight sheds at New Westminster, B.C.

17174, 17175. Aug. 6.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to cross forced road from Crow Lake to Sharbot Lake, Ont., and highway in Hamilton tp., Ont.

17176. Aug. 6.—Authorizing G.T. Pacific Branch Lines Co. to build spur for Pacific Pass Coal Fields, Ltd., North Alberta district.

17177, 17178. Aug. 3.—Authorizing G.T.R. to build siding into W. S. Cook & Son's premises, Belleville, Ont., and for Canadian Northern Montreal Land Co., St. Laurent parish, Quebec.

17179, 17180. Aug. 3.—Approving plans of Dominion Atlantic Ry. for additional wing walls for bridges at Bridgetown, and over Avon river, at Windsor, N.S.

17181. Aug. 6.—Authorizing Kettle Valley Ry. to cross highway northwest of Penticton, B.C.

17182. Aug. 3.—Authorizing Essex Terminal Ry. and Michigan Central Rd. to operate over crossing in Windsor, Ont., and rescinding order 16638, May 29, in same connection.

17183. Aug. 6.—Authorizing G.T. Pacific Branch Lines Co. to cross 12 highways on its Cutknife branch, Sask.

17184. Aug. 7.—Authorizing G.T. Pacific Ry. to carry traffic from mileage 100 to 164, east of Prince Rupert, B.C.

17185. Aug. 13.—Authorizing C.P.R. to build spur for G. F. Stephens & Co., Calgary, Alta.

17186. Aug. 7.—Approving Michigan Central Rd. plan for new bridge over London St., Windsor, Ont.

17187. Aug. 7.—Authorizing Dominion Atlantic Ry. to reconstruct Smiths Cove trestle, at mileage 144.1 from Halifax, N.S.

17188. Aug. 3.—Authorizing G.T. Pacific Branch Lines Co. to open for traffic its Young to Prince Albert branch, mileage 45.5 to Wakaw at mileage 67.

17189, 17190. Aug. 9, 8.—Authorizing C.P.R. to take lands in Montreal for railway purposes and for its Windsor St. station and terminals.

17191. Aug. 12.—Directing examination under oath at Toronto, of A. L. Hertzberg, Division Engineer, Ontario Division, C.P.R., re C.P.R. diverting course of Coldwater river in Medonte tp., Ont.

17192. Aug. 8.—Authorizing Canadian Northern Ry. to open for traffic its line between Morinville and Athabasca Landing, Alta., 72 miles, speed of trains not to exceed 15 miles an hour.

17193. Aug. 7.—Authorizing C.P.R. to build industrial spur across Park, Elizabeth and James streets, St. Marys, Ont.

17194. Aug. 8.—Approving C.N. Ontario Ry. stress sheets for bridge over Oavase river and C.P.R. mileage 224.2 from Ottawa.

17195. July 25.—Ordering Canadian Northern Ry., by Aug. 1, to install agent and provide temporary shelter at Briercrest, Sask., and to build station before Dec. 1.

17196. July 29.—Ordering Canadian Northern Ry., by Oct. 1, to build station and appoint agent at Ardath, Sask.

17197. Aug. 1.—Authorizing Mount McKay and Kakabeka Falls Ry. to cross Canadian Northern Ry. by temporary subway at Neebing Ave., Fort William, Ont.

17198, 17199. Aug. 12.—Authorizing C.N. Ontario Ry. to cross public roads in Bristol tp., Que., and March tp., Ont.

17200. Aug. 13.—Approving location of Canadian Northern Ry. station and freight shed at Dauphin, Man.

17201. July 25.—Authorizing Canadian Northern Ry. to build across road allowance between secs. 20-29, tp. 16, r. 26, w. 2 m.

17202. Aug. 12.—Authorizing British Columbia Southern Ry. (C.P.R.) to close crossing between 5th and 6th Aves., and open crossing at 7th Ave., Hosmer, B.C.

17203. Jnly 31.—Authorizing C.P.R. to cross road allowance in East Flamboro tp., Ont., mileage 11.27.

17204. Aug. 9.—Authorizing C.P.R. to build seven spurs at Magog, Que.

17205. Aug. 12.—Authorizing city of Vancouver, B.C., to cross C.P.R. with Clark drive.

17206. July 25.—Authorizing C.P.R. to build bridge over its tracks at Thunder creek, Sask, 20% to be paid from railway grade crossing fund, $5,000 by the city of Moose Jaw, and remainder by C.P.R.; city to maintain road and sidewalk on bridge.

17207. Aug. 12.—Dismissing application of Fullerton Lumber and Shingle Co., Vancouver, B.C., re overcharges on lumber alleged against C.P.R. and G.N.R.

17208. July 30.—Ordering G.T.R. to protect Wellington St. crossing, Hamilton, Ont., by watchman between 9 p.m. and 7 a.m.

17209. Aug. 13.—Ordering Vancouver, Westminster and Yukon Ry. to build siding for Bradford and Taylor, Vancouver, B.C.

17210. Aug. 7.—Authorizing Brandon Electric Light Co., and owners of other warehouses at Brandon, Man., to unload cars from Canadian Northern Ry. on lane between Lorne and Princess Aves., the Electric Light Co. to maintain roadway 16 ft. wide alongside cars.

17211. July 24.—General order putting into force uniform rules governing determination of visional acuity, color perception, and hearing of railway employes on steam railways.

17212. July 31.—Authorizing Georgian Bay and Seaboard Ry. (C.P.R.) to build drain through F. Walden's lands and to take certain lands in Ops tp., Ont.

17213. Aug. 15.—Approving location of G.T. Pacific Branch Lines Co.'s Regina-Moose Jaw branch, mileage 40.01 to 47.74, Moose Jaw district, Sask.

17214. Aug. 13.—Authorizing G.T.R. to build temporary track across Montreal, Park and Island Ry., and two tracks across Upper Lachine road, Montreal.

17215. Aug. 3.—Authorizing G.T.R. to build spur for Canada Iron Corporation, near Longford station, Ont.

17216. Aug. 15.—Authorizing G.T. Pacific Branch Lines Co. to cross C.P.R. with its Harte-Brandon branch, Man.

17217. Aug. 15.—Rescinding order 16723, June 11, approving plan of interlocker by Georgian Bay and Seaboard Ry. (C.P.R.), and approving plan for signals at Atherley swing bridge, at mileage 44, over Trent canal, Ont.

17218, 17219. Aug. 9, 7.—Authorizing C.P.R. to build spurs for J. Pepin, St. Therese de Balinville parish, Que., and Harris Tie and Timber Co., Algoma district, Ont.

17220. Aug. 8.—Authorizing C.P.R. to change its main line location in McNab tp., Ont.

17221. Aug. 13.—Authorizing corporation of North Cowichan, B.C., to build two roads across Esquimalt and Nanaimo Ry.

17222. July 29.—Authorizing Canadian Northern Ry. to build crossing opposite Andrews St., Tisdale, Sask.

17223. July 29.—Ordering Canadian Northern Ry. to install temporary agent at Waseca, Sask., by Sept. 15.

17224. Aug. 14.—Approving C.N. Ontario Ry. plans for Duchesnay creek.

17225. Aug. 14.—Authorizing C.P.R. to build spur for Alberta Box Co., Calgary Jct., Alta.

17226. Aug. 15.—Extending to Sept 30, time for completion by C.P.R. of branch line into Union Stockyards, Toronto, authorized by order 15768, Jan. 11.

17227. Aug. 14.—Authorizing C.P.R. to build spur for Calgary Grain and Seed Co., Titian, Alta.

17228. Aug. 15.—Extending to Sept. 30, time for completion by C.P.R. of spur into Union Stockyards, Toronto, authorized by order 15733, Jan. 4.

17229. July 29.—Ordering C.P.R. within 60 days to build transfer track connecting with Canadian Northern Ry. at Midale, Sask.

17230, 17231. Aug. 14.—Authorizing Mount McKay and Kakabeka Falls Ry. to cross C.P.R. and G.T. Pacific Ry. at Neebing Ave., Fort William, Ont., half interlockers to be installed.

17232. Aug. 14.—Authorizing Bell Telephone Co. to erect poles and wires on certain streets in Montreal.

17233. Aug. 12.—Approving G.T. Pacific Ry. station site at Loverna, Alta.

17234. Aug. 15.—Ordering that 20% of cost of gates at King and Sherbrooke Sts., Peterboro, Ont., be paid out of railway grade crossing fund, balance by G.T.R.; city to contribute 10% of cost of installing and maintaining gates at Sherbrooke St., and 15% at King St.

17235. Aug. 16.—Rescinding order 16795, June 19, appointing arbitrators of claim of L. J. Riopel against Quebec Oriental Ry., and appointing new arbitrators.

17236. Aug. 14.—Authorizing C.P.R. to take lands for enlargement of its Glen yard, Montreal.

17237. July 18.—Authorizing C.N. Quebec Ry. to cross public road in St. Jerome parish.

17238. Aug. 17.—Slightly amending order 17019, July 16, re G.T. Pacific Ry. spur to Macleon Collieries, Ltd.

17239, 17240. Aug. 16, 17.—Authorizing C.N. Ontario R. to cross public roads in Gibbons and Field tps.

17241. Aug. 16.—Ordering Canadian Northern Ry. to maintain level crossing at 24th St., Saskatoon, Sask.

17242. Aug. 16.—Authorizing C.P.R. to build spur for Wood, Vallance, and Adams, Calgary, Alta.

17243. Aug. 16.—Approving plans of C.N.R. standard 40,000 gallon tank.

17244. Aug. 15.—Approving supplement 1 to C.N.R. standard passenger tariff 285.

17245. Aug. 15.—Approving revised location of G.T. Pacific Branch Lines Co.'s Brandon branch, mileage 12.71 to 18.48, Man.

17246. Aug. 16.—Authorizing G.T.R. to rebuild 14 bridges on its Northern and Middle divisions, Ont.

17247. Aug. 14.—Approving G.T.R. revised location over Moores crossing, near Bracebridge, Ont.

17248. Aug. 17.—Approving British Columbia Electric Ry. bylaw for appointment of officers to issue tariffs of tolls.

17249. Aug. 19.—Approving Vancouver, Victoria and Eastern Ry. standard freight tariff C.R.C. 893.

17250. Aug. 14.—Ordering Canadian Northern Ry., within 30 days to file plans of subway at Victoria St., North Battleford, Sask.; 20% to be paid from railway grade crossing fund, 70% of remainder by C.N.R., and 30% by the town, work to be finished by Jan. 1, 1913.

17251. Aug. 19.—Extending to Sept. 15, time for completion by Hamilton Radial Ry. of gravel crossings at Burlington Beach, Ont., as required by order 17132, July 29.

17252. Aug. 20.—Amending order 15766, Dec. 13, 1911, by ordering that G.T.R. maintain switch to Hay Bros' elevator at Stoney Point, Ont., police trustees of village to pay $200 towards cost of maintenance.

17253. Aug. 20.—Ordering G.T. Pacific Ry. to furnish accommodation for receiving and loading of all traffic offered at Haysport, B.C.

17254. Aug. 22.—Authorizing Central Ry. of Canada to cross 11 highways in Caledonia and South Plantagenet tps., Ont.

17255. Aug. 14.—Amending order 16653, May 31, re carrying of Birch Ave. under G.T.R., by city of Hamilton, Ont.

17256. Aug. 22.—Authorizing G.T.R. to cross road allowance between lots 22 and 23, for relocation of siding at Vineland, Ont., as directed by order 16722, June 24.

17257. Aug. 21.—Approving supplement 11 to Express Classification for Canada 2.

17258. Aug. 16.—Authorizing Ontario Hydro-Electric Power Commission to erect wires across G.T.R. at lots 5 and 6, con. 9, Yarmouth tp.

17259. Aug. 21.—Authorizing C.P.R. to build spur for General Fire Extinguisher Co., Dundas St., Toronto.

17260. Aug. 16.—Approving proposed location of C.P.R. station at Cooksville, Ont.

17261, 17262. Aug. 20.—Relieving C.P.R. from further protecting crossings at Dundas St., Cooksville, and at mileage 79, Windsor subdivision, near Tilbury station, Ont.

17263. Aug. 20.—Rescinding order 15466, Nov. 22, 1911, re provision of undercrossing by Atlantic, Quebec and Western Ry. at Breche a Manon, Que.

17264, 17265. Aug. 21.—Authorizing C.P.R. to build spur into Sims ballast pit, Sask., and for Price Bros., St. Francois Xavier de Batiscan parish, Que.

17266. Aug. 21.—Authorizing St. Marys and

Western Ontario Ry. (C.P.R.) to cross 14 highways near St. Marys, Ont.

17267, 17268. Aug. 21, 20.—Authorizing C.P.R. to build spur for Joliette Steel and Iron Foundry, Joliette, Que., and extension to spur for A. B. Cushing Lumber Co., Calgary, Alta.

17269. Aug. 19.—Ordering C.P.R. to operate trains over Main St., Minnedosa, Man., not exceeding 6 miles an hour.

17270. Aug. 23.—Temporarily approving C.P.R. standard freight mileage tariff C.R.C. no. W.1758.

17271. Aug. 23.—Authorizing C.N. Ontario Ry. to build bridge across main channel of Riviere des Prairies, mileage 40 from Hawkesbury, Que.

17272. Aug. 21.—Authorizing Canadian Northern Ry. to operate spur to Gervais coal mine, Alta.

17273. Aug. 23.—Approving plans of Canadian Northern Ry. standard no. 7 station for Eastern lines.

17274. Aug. 21.—Approving revised location G.T. Pacific Branch Lines Co.'s station site at Sander, Sask.

17275. Aug. 20.—Approving location of G.T. Pacific Branch Lines Co.'s Brandon branch, mileage 18.48 to 21.86, Man.

17276. Aug. 20.—Authorizing G.T. Pacific Branch Lines Co. to carry traffic over its Young to Prince Albert branch, between mileage 45.5, and Wakaw, 21.5 miles, and rescinding order 17188, Aug. 3, 1912, authorizing similarly.

17277. Aug. 16.—Amending order 16053, Mar. 1, re G.T.R. crossings at Tavistock, Ont.

17278. Aug. 21.—Relieving Windsor, Essex and Lake Shore Rapid Ry. from further protecting crossing 4½ miles south of Windsor, Ont.

17279. Aug. 22.—Authorizing branch to Steel Co. of Canada and Brown Boogs Co., Hamilton, Ont., to be used jointly by Toronto, Hamilton and Buffalo Ry. and G.T.R.

17280. Aug. 21.—Authorizing G.T.R. to rebuild draw span at bridge 138, District 32, Rose Point, Ont.

17281. Aug. 31.—Authorizing C.P.R. to build spur to industrial plants east of Neebing Ave., Fort William, Ont., also to cross under C.N.R.

17282. Aug. 22.—Authorizing C.P.R. to cross 34 highways on its Crowsnest Pass branch between Seven Persons and Grassy Lake, and approving revised location.

17283. Aug. 23.—Authorizing C.P.R. to connect with G.T.R. spur for D. Maxwell & Son, St. Marys, Ont.

17284. Aug. 22.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to cross and divert two highways, South Sherbrooke tp., Ont.

17285. Aug. 23.—Authorizing Canadian Northern Ry. to cross six highways on its Vonda northerly line.

17286. Aug. 23.—Authorizing C. N. Ontario Ry. to build bridge across Pike river, Field tp.

17287. Aug. 23.—Authorizing Great Northern Ry. to build crossing over highway near Fruitvale station, B.C.; station to be kept clean and heated during winter; and dismissing Fruitvale Trading Co.'s application for removal of station.

17288. Aug. 23.—Authorizing Surrey municipality, B.C., to build highway crossings across G.N.R. and Victoria Terminal and Ferry Co.'s tracks, near Cloverdale, B.C.

17289. Aug. 22.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to cross Anderson and Brock streets, Whitby, Ont.

17290. Aug. 29.—Approving Pacific and Arctic Ry. and Navigation Co., British Columbia Ry., and British Yukon Ry. joint standard passenger tariff, C.R.C. 6.

17291. Aug. 27.—Authorizing G.T.R. to build siding for Harris Abattoir Co., West Toronto, Ont.

17292. Aug. 24.—Authorizing C.P.R. to open for traffic its Galloway to Waldo branch, from Caithness to Waldo.

17293. Aug. 24.—Approving location of C.P.R. Asquith to Conquest branch, mileage 0 to 35, and authorizing 18 highway crossings.

17294. Aug. 27.—Approving C.N. Ontario Ry. revised location through White, Fitzgerald, Deacon, Lister, and Boyd tps., Nipissing district, mileage 265.34 to 285.53 from Montreal.

17295. Aug. 27.—Approving revised location of C.P.R. Boissevain to Lander branch, Man., for 35.29 miles.

17296. Aug. 26.—Authorizing C.P.R. to build two spurs along harbor quay, Goderich, Ont.

17297. Aug. 27.—Approving revised location of C.P.R. Estevan to Forward branch, mileage 0 to 55.0, Sask.

17298. Aug. 26.—Approving Georgian Bay and Seaboard Ry. (C.P.R.) plan for arrangement of signals at swing bridge over Trent canal at mileage 44.

17299. Aug. 26.—Authorizing C.P.R. to build four bridges on its White River and Chapleau subdivisions, Lake Superior division.

17300. Aug. 27.—Authorizing C.P.R. to build second track across seven streets in Vancouver, B.C.

17301. Aug. 24.—Approving location of C.P.R. Swift Current branch, mileage 0 to 84.98, Sask.

17302. Aug. 24.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build bridge 180.02.

17303. Aug. 24.—Authorizing Esquimalt and Nanaimo Ry. to build spur for Canadian Pacific Lumber Co., Port Alberni, B.C.

17304. Aug. 26.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build bridge at mileage 113.95.

17305. Aug. 27.—Authorizing town of Brampton, Ont., to build highway over C.P.R. at Joseph St.

17306. Aug. 27.—Ordering C.P.R. to build station at Salmon Arm, B.C.

17307. Aug. 27.—Amending order 14877, Sept. 4, 1911, re subway under C.P.R. at Columbia Ave., Vancouver, B.C.

17308. Aug. 26.—Authorizing Canadian Northern Ry. to cross 12 highways with its Calgary southerly branch, Alta.

17309 to 17311. Aug. 27, 26.—Approving C.N. Ontario Ry. revised location through Westmeath and Pembroke tps.; southward from Capreol Jct., and through Boyd and Pentland tps.

17312. Aug. 26.—Authorizing C.N. Ontario Ry. to cross and divert public road on lot 11, cons. 2 and 3, Gibbons tp.

17313. Aug. 26.—Authorizing C.N. Ontario Ry. to build spur for Provincial Steel Co., Cobourg, Ont.

17314. Aug. 24.—Approving C.N. Ontario Ry. revised location in Camden tp.

17315, 17316. Aug. 24, 27.—Authorizing G.T.R. to build extension of siding for Lake Simcoe Ice Supply Co., Florence St., North Parkdale, Toronto, and spur for Shale Products, Ltd., Caledon tp., Ont.

17317 Aug. 24.—Approving detail plans of bridge carrying Queen St. across G.T.R. at Sunnyside, Toronto.

17318. Aug. 27.—Authorizing G.T.R. to build spur for Hall Foundry Co., Hespeler, Ont.

17319, 17320. Aug. 26.—Authorizing Toronto Eastern Ry. to cross two highways in Whitby tp., and public roads in Pickering and Whitby tps., Ont.

17321. Aug. 27.—Approving plan of Edmonton, Dunvegan and British Columbia Ry. for standard overhead crossing.

17322. Aug. 26.—Authorizing Page-Hersey Iron Tube and Lead Co., to operate travelling crane over G.T.R. Lachine canal branch, Montreal.

17323. Aug. 22.—Authorizing Canadian Northern Ry. to build ditch upon M. Wallace's property, Ochre River, Man.

17324. Aug. 27.—Approving Niagara, Welland and Lake Erie Ry. location in Welland, Ont., and authorizing crossing of Michigan Central Rd., and G.T.R.

17325. Aug. 27.—Authorizing Vancouver and Lulu Island Ry. to build second track across 22 streets and avenues in Vancouver, B.C.

17326. Aug. 27.—Ordering G.T.R. to install warning gong at Notre Dame and St. Ferdinand streets, St. Henri, Montreal.

17327. Aug. 24.—Authorizing Midland Ry., of Manitoba (G.N.R.) and G.T. Pacific Ry. to operate trains without stopping over crossing by interlocker in St. Boniface parish, Man.

17328. Aug. 29.—Recommending to Governor in Council for approval, lease between C.P.R. and Esquimalt and Nanaimo Ry.

17329. Aug. 28.—Authorizing Kings County municipality, N.S., to build crossing over Dominion Atlantic Ry.

17330, 17331. Aug. 2, 29.—Approving location of Campbellford, Lake Ontario and Western Ry. (C.P.R.) from mileage 125.5 to 127.32, and slightly amending order 16978, July 11, re crossing of Oshawa Ry.

17332, 17333. Aug. 28.—Approving Canadian Northern Ry. location through Macleod, Alta., mileage 102.05 to 104.26; and authorizing it to cross public road with its Calgary southerly line.

17334. Aug. 28.—Authorizing C.N. Ontario Ry. to cross public road in Clarendon tp.

17335. Aug. 28.—Authorizing G.T.R. to build spur for Massey-Harris Co., Toronto.

17336, 17337. Aug. 28.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build bridge 27.28 over Fish creek, and to cross road allowance at mileage 47.45, Camden tp., Ont.

17338. Aug. 28.—Authorizing Toronto Eastern Ry. to cross public road in Whitby East tp., Ont.

17339. Aug. 28.—Rescinding order 14440, July 28, 1911, and ordering Canadian Northern Ry. to build subway across road allowance, sec. 10-15, tp. 65, r. 22, w. 4 m., Alta.

17340. Aug. 28.—Authorizing Bell Telephone Co. to maintain poles and wires on certain streets in Montreal.

17341, 17342. Aug. 29, 27.—Authorizing C.N. Ontario Ry. to cross two highways in Field tp., and approving location of station grounds at mileage 22 from Ottawa.

17343. Aug. 31.—Authorizing Canadian Northern Ry. to build its Calgary southerly line across four streets and road allowance at High River, Alta.

17344. Aug. 31.—Approving C.N. Ontario Ry. revised location through Alice and Fraser tps.

17345. Aug. 29.—Authorizing C.N. Ontario Ry. to cross C.P.R. Stobie branch in McKim tp.

17346. Aug. 30.—Authorizing Canadian Northern Ry. to cross 11 highways on its Alsask southeasterly branch.

17347. Aug. 30.—Relieving C.P.R. from further protecting crossing 2,950 ft. west of mileage 1, Sault branch, Ont.

17348, 17349. Aug. 29.—Authorizing C.P.R. to build bridges 0.4 and 126.5 on its White River and Nipigon subdivisions, Lake Superior division, Ont.

17350. Aug. 31.—Authorizing Drury, Denison and Graham tps. to extend public road across C.P.R. at Worthington station, Ont.

17351. Aug. 30.—Amending order 16961, July 4, re appropriation of lands for C.P.R. Windsor St. terminal, Montreal.

17352, 17353. Aug. 31.—Authorizing C.P.R. to build its double track across 13 highways, mileage 94.33 to 105.59, Moose Jaw subdivision; and across 26 highways on its Swift Current subdivision, mileage 23.29 to 41.99, Sask.

17354. Aug. 31.—Authorizing Canadian Northern Ry. to cross public road on its Alsask southeasterly line.

17355, 17356. Aug. 28.—Approving location of C.P.R. stations, on lot 14, con. 10, Vespra tp., and at Straffordville, Ont.

17357. Aug. 29.—Authorizing C.P.R. to build spur for W. H. Hunter, Regina, Sask.

17358. Aug. 27.—Relieving C.P.R. from erecting fences on certain portions of its Cascade, Nicola, Westminster, Mission and Thompson subdivisions, B.C.

17359. Aug. 28.—Approving C.P.R. proposed location at Fordwich, Ont.

17360 to 17364. Aug. 30, 29, 28.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to take portion of G.T.R. land at mileage 97.5; to cross 18 highways, mileage 40.47 to 114.57; approving location from mileage 174 to 176 from Glen Tay, and from mileage 121 to 124.83, and authorizing it to build bridge 178.55 over Little Rouge river, Ont.

17365. Aug. 30.—Approving G.T. Pacific Branch Lines Co.'s station site in Prairiedale, Alta.

17366. Aug. 29.—Authorizing G.T.R. to build extension of siding for Canadian National Carbon Co., Toronto.

17367. Aug. 29.—Approving plans of G.T.R. interlocking plant to protect bridge across Welland canal and railway crossing at Port Colborne, Ont.

17368. Aug. 29.—Authorizing G.T.R. to build spur for H. M. Lickey, Ltd., Gravenhurst, Ont.

17369. Aug. 30.—Ordering that crossing of Plains road, Nelson tp., Ont., by G.T.R. be protected by subway.

17370. Aug. 29.—Approving G.T.R. plans for new station and rearrangement of yard at Hensall, Ont.

17371. Aug. 31.—Amending order 17034, July 18, re new union station at Toronto, by adding that the approval granted by this order shall not be taken as authorizing G.T.R. to take C.P.R. lands.

17372. Aug. 30.—Authorizing C.P.R. to continue use of Bay of Quinte Ry. spur, Tweed, Ont., on payment of $1 a loaded car, movements of empties in opposite direction to be free.

17373. Aug. 29.—Approving location of Nipissing Central Ry. extension from Haileybury to New Liskeard, Ont.

17374. Aug. 31.—Approving Edmonton, Dunvegan and British Columbia Ry. location from mileage 0 to 5.13.

17375. Aug. 29.—Authorizing Toronto, Hamilton and Buffalo Ry. to build spur to serve Dominion Steel Castings Co., Hamilton, Ont.

17376. Aug. 29.—Approving Windsor, Essex and Lake Shore Rapid Ry. bylaw 10, authorizing E. S. Hughes, Traffic Manager, to prepare tariffs.

17377. Aug. 28.—Authorizing G.T.R. to rebuild five bridges on its Northern division, and nine bridges on its Middle division, Ont.

17378, 17379. Aug. 31, 30.—Approving G.T. Pacific Branch Lines Co. station sites at Adine, Alta., and Cedoux, Sask.

17380. Aug. 31.—Authorizing C.P.R. to build spur for Grant Smith & Co. and McDonnell, Ltd., Southesk, Alta.

17381. Aug. 30. — Authorizing Winnipeg Electric Ry. to cross Canadian Northern Ry. spur on Rue de Meuron, St. Boniface, Man.

17382. Aug. 31.—Ordering Brockville, Westport and North Western Ry. to build cattle pass for W. McLean, Elizabethtown, Ont.

17383. Sept. 3.—Extending to Nov. 1, time for completion by C.N. Ontario Ry. of interlocker crossing C.P.R. at Chaudiere Jct.

17384. Sept. 4.—Naming tariff for shipment of cream for express companies subject to Board's jurisdiction, applying west of Port Arthur, Ont., covered by Express Classification for Canada 2.

17385. Aug. 26.—Approving Niagara, St. Catharines and Toronto Ry. location from crossing of Welland canal, in St. Catharines, at mileage 0.75, to mileage 11 at Niagara-on-the-Lake, Ont.

17386. Aug. 28.—Approving G.T.R. plans for new station at St. Gregoire, Que.

17387. Sept 3.—Ordering G.T.R., within 30 days, to file plans showing adequate accommodation for handling freight traffic at Quebec, Que.

17388. Sept. 3.—Approving Canadian Northern Ry. station location and building at Fort Frances, Ont.

17389. Aug. 31.—Removing speed limitation on trains on C.P.R. Weyburn-Lethbridge branch, provided by order 15696, Dec. 27, 1911.

17390. Aug. 31.—Amending order 16843, June 25, re Yonge street and Avenue road subways, Toronto; land damages to be paid by city.

17391. Aug. 30.—Authorizing C.P.R. to lay sewer and water pipes across Birds Hill road, near Winnipeg.

17392, 17393. Aug. 30.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to take G.T.R. lands for right of way; and to build three bridges at mileage 143.46, 135.75 and 134.42, Ont.

17394. Aug. 28.—Approving Canadian Northern Ry. location through tps. 22-19, r. 29-28, w. 4 m., mileage 13.21 to 31.40.

17395. Sept. 4.—Authorizing Edmonton, Dunvegan and British Columbia Ry. to cross six highways, mileage 1.2 to 4.7, Alta.

17396. Aug. 16.—Authorizing G.T. Pacific Branch Lines Co. to cross road at mileage 31.7, Sask., with its Regina-Moose Jaw branch.

17397. Sept. 5.—Authorizing C.P.R. to build three additional tracks across Canadian Northern Ry. Birds Hill branch near Woods, Man., interlocking plant to be installed.

17398. Aug. 30.—Authorizing C.P.R. to build spur from Princess St. to Winnipeg Steam Heating Co., Winnipeg.

17399. Sept. 4.—Authorizing Kootenay Central Ry. (C.P.R.) to cross highways from mileage 3.37 to 45.34, northerly from Colvilli, B.C.

17400. August 30.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to take certain G.T.R. lands for right of way.

17401. Sept. 4.—Ordering Canadian Northern Ry. to build spur for Pintsch Compressing Co., Edmonton, Alta.

17402. 17403. Sept. 3.—Authorizing C.N. Ontario Ry. to build over Mississippi river and Marlborough creek, Carleton county, Ont.

17404. Sept. 4.—Authorizing British Columbia Electric Ry. to cross C.P.R. at 12th St., New Westminster.

17405. Sept. 4.—Authorizing British Columbia Electric Ry. to cross Vancouver, Fraser Valley and Southern Ry. on Nanaimo St. at 1st Ave., Vancouver.

17406. Sept. 4.—Authorizing Niagara, St. Catharines and Toronto Ry. to build spur for Canadian Warren Axe and Tool Co., St. Catharines, Ont.

17407. Sept. 4.—Authorizing city of Hamilton, Ont., to extend Birmingham St. across Hamilton Radial Ry.

17408. Sept. 5.—Authorizing G.T. Pacific Ry. to appeal to Supreme Court of Canada from order 16701, June 4, re crossing by Edmonton Radial Ry., at 21st street, Edmonton, Alta., upon certain questions of law.

17409. Sept. 7.—Authorizing C.P.R. to open for freight traffic its branch from Laggan to Lake Louise, Alta., 3.55 miles.

17410. Sept. 9.—Authorizing C.P.R. to open for traffic that portion of its Swift Current southeasterly branch from Neville to Vanguard, Sask., mileage 27.5 to 43.6.

17411. Sept. 7.—Amending orders 13509, 13582, and 13610 which authorized Canadian Northern Ry. to take certain C.P.R. lands, by providing that compensation and damages be settled by three arbitrators.

17412. Sept. 6.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build across road allowance between cons. 7 and 8, Hinchinbrooke tp., Ont.

17413. Sept. 9.—Authorizing Canadian Northern Ry. to build across public road between secs. 25 and 26, tp. 27, r. 11, w. 3 m.

17414. Sept. 7.—Authorizing Canadian Northern Montreal Tunnel and Terminal Co. to build across public road between lot 359, Cote St. Laurent Sud, and lot 622, Cote St. Laurent Nord, subject to undertaking to keep men from tops of cars when operating this section.

17415. Sept. 6.—Authorizing G.T.R. to operate crossing of Toronto Suburban Ry. on Keele St., Toronto.

17416. Sept. 4.—Authorizing British Columbia Electric Ry. to connect with C.P.R. in Vancouver.

17417. Sept. 6.—Authorizing rural municipality 351, Progress, Sask., to build highway over C.P.R. between secs. 4 and 9, tp. 36, r. 24, w. 3 m.

17418. Sept. 5.—Authorizing Canadian Northern Ry. to build across and divert public roads between secs. 11 and 14, and secs. 10 and 15, tp. 16, r. 27, w. 4 m.

17419. Sept. 5.—Authorizing Canadian Northern Ry. to build across 30 highways on its Calgary-Macleod branch, Alta.

17420. Sept. 5.—Authorizing C.N. Ontario Ry. to build across Riviere des Prairies west channel, Ste. Dorothee parish, Que., mileage 39.6, east of Hawkesbury.

17421, 17422. Sept. 6.—Authorizing C.N. Ontario Ry. to build across public road at station 142.70, between Bristol and Clarendon tps., Que., by overhead structure, and to build bridge across creek at station 754.15, Ferris tp., mileage 223 from Ottawa.

17423. Sept. 4.—Authorizing Canadian Northern Branch Lines Co. to build across 14 highways on its Canora-Sturgis branch, Sask.

17424. Sept. 6.—Authorizing James Bay and Eastern Ry. (C.N.R.) to build bridge over and divert stream and farm road, at station 48.50, Demeules tp., Que., mileage 18.55 from Roberval.

17425. Sept. 7.—Authorizing G.T. Pacific Branch Lines Co. to build its Regina-Moose Jaw branch across four highways between mileage 40.01 and 47.74, Sask.

17426. Sept. 6.—Authorizing C.P.R. to use bridge 68 on its Muskoka subdivision, Ontario division.

17427. Sept. 3.—Authorizing C.P.R. to rebuild bridge 102.55 over Blind river, Algoma subdivision, Lake Superior division, Ont.

17428. Sept. 6.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build across three highways from mileage 157.47 to 157.98, Ont.

17429. Sept. 7.—Authorizing Algoma Central and Hudson Bay Ry. to open for traffic its line between Hawk Lake Jct. and Hobon, Ont., mileage 164½ to 195, connecting with C.P.R.

17430. Sept. 6.—Authorizing G.T.R. to build spur for Standard White Lime Co., near Beachville, Ont.

17431. Sept. 5.—Authorizing G.T. Pacific Branch Lines Co. to build across and divert highway on its Melville-Regina branch in n.w. ¼ sec. 12, tp. 20, r. 15, w. 2 m., mileage 57, Assiniboia district, Sask.

17432. Sept. 9.—Authorizing Canadian Northern Ry. to build bridge over Assiniboine river, Winnipeg, Man.

17433. Sept. 10.—Authorizing C.N. Ontario Ry. to build across Brule creek, Springer tp., mileage 250.6 from Ottawa.

17434. Sept. 11.—Authorizing C.P.R. to build across G.T.R. at grade one mile north of St. Johns, Que.

17435. Sept. 10.—Authorizing C.P.R. to build extension to spur for W. J. Riley, at mileage 20.1, Lac du Bonnet subdivision, near Molson, Man.

17436. Sept. 4.—Extending to Oct. 30, time within which Walkerton and Lucknow Ry. (C.P.R.) may build spur for National Portland Cement Co., Brant tp., Ont.

17437. Sept. 11.—Authorizing C.P.R. to build across G.T.R. at Delson Jct.

17438, 17439. Sept. 10.—Authorizing Campbellford, Lake Ontario & Western Ry. (C.P.R.) to build across four highways from mileage 66.18 to 68.62, from Glen Tay, Ont., and to build bridge 111.

17440. Sept. 11.—Authorizing Kootenay and Alberta Ry. (C.P.R.) to open for freight traffic, speed over all trestles not to exceed four miles an hour, over rest of line 10 miles an hour; light power to be used; watchman to be kept on each trestle, and towers and foundations under Howe truss spans to be inspected at least once a week.

17441. Sept. 9.—Authorizing town of Paris, Ont., to cross G.T.R. with overhead bridge, easterly from Paris Jct.

17442. Sept. 9.—Authorizing C.P.R. to build spur for Eddy Bros. & Co., Blind River, Ont.

17443 to 17449. Sept. 10.—Authorizing C.P.R. to build spurs for Northern Aluminum Co., Parkdale, Ont. (2); E. W. Gillett Co., Toronto (2); to Pontypool ballast pit, Manvers tp., Ont.; for Dominion Government at Kipawa, Ont. (2); to build Y in old ballast pit at Algoma, Long tp., Ont.; and spurs for Gus Pech Foundry & Mfg. Co., Regina, Sask., and Taylor Forbes Co., Guelph, Ont.

17450. Sept. 10.—Authorizing G.T.R. to build siding for Breakwater Co., in Bertie tp., Ont.

17451. Sept. 7.—Authorizing C.N. Ontario Ry. to cross Nosbonsing and Nipissing Ry. with overhead bridge in Ferris tp., mileage 217.9 from Ottawa.

17452. Sept. 10.—Approving location of C.N. Quebec Ry. station grounds at Portage du Fort.

17453, 17454. Sept. 12.—Approving revised location C.N. Ontario Ry. Sudbury-Port Arthur line through unsurveyed territory in Algoma district, mileage 271.53 to 274.16, and in Thunder Bay district, mileage 268.03 to 269.3, from Port Arthur.

17455. Sept. 12.—Authorizing James Bay and Eastern Ry. (C.N.R.) to build across two highways in Ouiatchouan tp., Que.

17456. Sept. 12.—Approving Campbellford, Lake Ontario & Western Ry. (C.P.R.) plan of subway on road allowance between lots 8 and 9, con. 4, Scarboro tp., Ont.

17457. Sept. 13.—Amending order 17190, re C.P.R., expropriating lands for its Windsor street station, Montreal.

17458. Sept. 12.—Approving Canadian Northern Branch Lines Co.'s location through tps. 19 to 24, r. 1 and 2, w.p.m., mileage 36.58 to 74.47.

17459, 17460. Sept. 12.—Authorizing C.N. Ontario Ry., to open for traffic its line, in Camden tp., mileage 152.13 to 152.72, and mileage 145.83 to 149, from Toronto.

17461. Sept. 12.—Approving James Bay and Eastern Ry. (C.N.R.) extension from Roberval, Que., mileage 30.7 to 31.4.

17462, 17463. Sept. 12.—Approving Alberta Interurban Ry. location, from north line of sec. 31, tp. 24, r. 28, to east line of tps. 27-28, r. 27, w. 4 m., mileage 9.93 to 38.36, and from the latter point to sec. 15, tp. 29, r. 23, w. 4 m., from mileage 38.36 to 66.80; and authorizing to build along highways.

17464, 17465. Sept. 13.—Approving Dominion Atlantic Ry., plans showing substructure of bridge over Gaspereaux river, at Horton Landing, N.S., and approving revised location across Gaspereaux river, just east of Horton Landing.

17466. Sept. 10.—Approving G.T. Pacific Branch Lines Co. location from north line of sec. 8, tp. 20, r. 28, w. 4 m., mileage 27.67, to west line of n.w. ¼ sec. 34, tp. 11, r. 23, w. 4 m., mileage 111.29.

17467. Sept. 10.—Authorizing G.T. Pacific Branch Lines Co., to build across 10 highways on its Calgary-Boundary branch, mileage 36.2 to 111.1, Alta.

17468, 17469. Sept. 13.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build four bridges, and to build across Kingston road, or road allowance between cons. 1 and 2, Clarke tp., Ont., by means of an arch, at mileage 142.35, from Glen Tay.

17470. Sept. 13.—Approving Canadian Northern Ry., station site and track layout at Calgary, Alta.

17471. Sept. 14.—Approving city of Toronto's plan changing grade of Coxwell avenue subway.

17472. Sept. 13.—Authorizing Toronto Suburban Ry. to cross under G.T.R., at Weston road, Weston, Ont.

17473. Sept. 14.—Authorizing Vancouver and Lulu Island Ry. to open for traffic its second track from Twenty-fourth avenue, Point Grey, to Eburne, B.C., 4½ miles.

17474. Sept. 13.—Authorizing C.N. Ontario Ry, to cross C.P.R. overhead, near Pembroke.

17475. Sept. 11.—Authorizing G.T.R. to rebuild bridge at mileage 171.07, near Arnprior, Ont.

17476. Sept. 14.—Approving revised location of G.T. Pacific Branch Lines Co., Cutknife branch, through s.e. ¼ sec. 36, tp. 43, r. 18, w. 3 m., mileage 9, West Saskatchewan district.

17477. Sept. 12.—Ordering C.P.R. to divert Toronto and Sydenham road, northerly to Fifty side road, crossing railway at right angles, 1¼ miles north of Berkley station.

17478. Sept. 12.—Ordering C.P.R. to install gates and keep day and night watchman at King street crossing, Woodstock, N.B.

17479. Sept. 14.—Authorizing C.P.R. to build bridge at mileage 10.4, Farnham subdivision, Eastern division.

17480. Sept. 14.—Approving C.P.R. standard timber overhead crossing plan.

17481, 17482. Sept. 12, 16.—Authorizing C.P.R. to lay new track across public road south of cadastral lot 125, change location of present track, build additional track across the public road south of cadastral lot 191, change location of its station at St. Hyacinthe, Que., and to build spur for L. Villeneuve & Co. on Maude St., Montreal.

17483. Sept. 14.—Authorizing Canadian Northern Ry. to build its Goose Lake extension across public roads between secs. 7 and 8, tp. 31, r. 14, w. 4 m.

17484 to 17486. Sept. 17.—Authorizing Alberta Interurban Ry. to cross G.T. Pacific Ry., in secs. 10-11, tp. 24, r. 29, w. 4 m., approving location from mileage 0 to 5.49, and from fifth meridian east to north line of sec. 31, tp. 24, r. 28, w. 4 m., mileage 2.28 to 9.93.

17487. Sept. 14.—Authorizing G.T. Pacific Ry. to build its Calgary-Boundary branch across 52 highways, from mileage 27.67 to 111.29, South Alberta district.

17488. Sept. 16.—Authorizing Michigan Central Rd. to build two passing tracks between cons. 6 and 7, Crowland tp., Ont.

17489. Sept. 16.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build across four highways in Sidney tp., Ont.

17490. Sept. 17.—Extending to Oct. 15, time for Canadian Northern Ry. to complete fencing, cattle guards, crossing signs, etc., from Grosse Isle, Man., to end of track, 31 miles.

17491. Sept. 16.—Amending order 15449, Sept. 15, 1911, to provide half interlocking plant instead of full interlocking plant, where Winnipeg Electric Ry. crosses C.P.R. Selkirk branch, on Selkirk avenue, and McPhillips street.

17492. Sept. 16.—Amending order 17384, Sept. 4, re express charges on cream, to make it apply between all points west of and including Port Arthur, in Ontario, Manitoba, Saskatchewan, and Alberta, instead of between all points west of Port Arthur.

17493. Sept. 16.—Suspending supplement 10, to M.C.R. local and joint commodity tariff, C.R.C. 1743, pending hearing by Board.

17494. Sept. 16.—Authorizing National Transcontinental Ry. Commissioners to operate over crossing of C.P.R., near St. Leonards, N.B.

17495. Sept. 17.—Approving C.P.R. plan of covered platform at Windsor, Ont.

17496. Sept. 17.—Approving Michigan Central Rd. plan of culvert on west town line road, Maidstone tp., Ont.

17497. Sept. 17.—Authorizing G.T.R. to build siding and spur for Knechtel Furniture Co., Hanover, Ont.

17498. Sept. 17.—Extending to Sept 30, the time for Dominion Atlantic Ry. to install electric bell at crossing east of Berwick station, N.S.

17499. Sept. 17.—Authorizing C.P.R. to

build spur for Canadian Western Lumber Co., at Fraser Mills, B.C.

17500. Sept. 16.—Approving location of C.P.R. station at Twin Butte, B.C.

17501. Sept. 17.—Authorizing C.P.R. to build bridge 86.16, over Woman river, Lake Superior division, Ont.

17502. Sept. 17.—Authorizing Kootenay Central Ry. (C.P.R.) to open for traffic portion of its line from Colvalli, to Fort Steele, B.C., mileage 0 to 23.06.

17503, 17504. Sept. 17, 16.—Approving G.T. Pacific Ry. revised location from lot 4077 to sec. 22, tp. 15, mileage 347.5 to 372.4, and from lot 880 to Sa-La-Quo Indian reserve, mileage 449.18 to 452.94, east of Prince Rupert, B.C.

17505, 17506. Sept. 17.—Authorizing C.P.R. to build spurs for N. Blue, at Pilot Butte, Sask., and for city of Moose Jaw, Sask.

17507. Sept. 18.—Authorizing Saskatchewan government to build highway across Canadian Northern Ry., north of sec. 14, tp. 43, r. 20, w. 2 m.

17508. Sept. 18.—Authorizing G.T. Pacific Branch Lines Co. to build its Melville-Regina branch across highway, and divert road in Pasquah Indian reserve, mileage 52.7, Assiniboia district, Sask.

17509. Sept. 17.—Approving Canadian Northern Ry. revised location through tps. 43 and 44, r. 4, w. 3 m., mileage 28.18 to 37.96, Sask.

17510. Sept. 18.—Approving C.N. Ontario Ry. plan of abutments for bridge over Wistiwasing river, Chisholm tp., mileage 214.65, west of Ottawa.

17511. Sept. 16.—Authorizing Shepard council no. 12 Z 4, Alta., to build highway across C.P.R., between sec. 23, tp. 23, r. 27, and sec. 18, tp. 23, r. 28, w. 4 m.

17512 to 17515. Sept. 17, 18.—Approving Campbellford, Lake Ontario and Western Ry. (C.P.R.) plan of 20 ft. double plate girder span on concrete abutments for bridge 158; and authorizing it to build across road allowance between cons. 4 and 5, Hinchinbrooke tp., Ont., mileage 29.2, from Glen Tay, and to divert portion across its line; to build bridge 146.16, and to cross road allowance between lots 16 and 17, con. 1, Darlington tp., by a bridge, at mileage 150.37 from Glen Tay.

17516. Sept. 10.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to cross G.T.R. overhead, in lot 23, con. A, Hamilton tp., mileage 121.52, from Glen Tay, Ont.

17517. Sept. 17.—Ordering G.T.R. to protect William street crossing, London, Ont., by day watchman.

17518. Sept. 18.—Authorizing G.T. Pacific Branch Lines Co. to build between its Battleford and Cutknife branches, to cross highways and establish terminals at Battleford, Sask.

17519, 17520. Sept. 18.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build across road allowance between lots 2 and 3, con. 1, Hope tp., mileage 125.36, and across 10 highways, from mileage 110.96 to 121.26, and 156.74 to 156.84, from Glen Tay, Ont.

17521. Sept. 17.—Authorizing C.N. Ontario Ry. to build bridge across Ottawa river, at Portage du Fort, mileage 59.8 from Ottawa.

17522. Sept. 18.—Amending order 17221, Aug. 13, re building of two roads across Esquimalt and Nanaimo Ry., at North Couripan, B.C.

17523. Sept. 19.—Authorizing C.P.R. to build 500 ft. siding near Bryce avenue, Toronto.

17524. Sept. 18.—Authorizing C.N. Ontario Ry. to cross C.P.R. overhead, on lot 6, con. 4, McKim tp., Ont.

17525. Sept. 18.—Approving location of C.P.R. station at Jeannette, Ont.

17526. Sept. 19.—Relieving C.P.R. from further protecting crossing 2½ miles west of Arthur, Ont.

17527. Sept. 18.—Authorizing C.P.R. to build spur for Milverton Furniture Co., Milverton, Ont.

17528. Sept. 18.—Approving change in location of C.P.R. station at Batiscan, Que.

17529. Sept. 18.—Authorizing G.T.R. to build two additional tracks across Cote St. Paul road, Montreal.

17530, 17531. Sept. 18.—Approving G.T. Pacific Ry. revised location through Noon-La Indian reserve, mileage 395, east of Prince Rupert, and from lot 478 to n.w. ¼ lot 6028, mileage 49.26 to 58.17, Fort George district, B.C.

17532. Sept. 20.—Authorizing C.P.R. to open for traffic its double track from L'Acadie to north of G.T.R. diamond crossing at St. Johns, Que., about 3.60 miles.

17533. Sept. 21.—Extending for 60 days time within which G.T.R. may complete new station and rearrange yard at Hensall, Ont., as ordered by order 17370.

17534. Sept. 19.—Authorizing C.N. Ontario Ry. to build across public road overhead, on lot 18, between r. A and 1, Westmeath tp., Ont.

17535. Sept. 19—Authorizing Canadian Northern Ry. to build its Goose lake extension

17536. Sept. 19.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build bridge 62.8.

17537 to 17541. Sept. 21.—Authorizing C.N. Ontario Ry. to build across public road on lot 275, St. Benoit parish, Que.; road between cons. 16 and 17, Chisholm tp., mileage 213.46; across Twelve Mile creek, Trafalgar tp., mileage 27.64 west from Toronto; across Winter road, lot 27, con. 7, Ferris tp., mileage 219.09, and across Credit river, mileage 15.19 west of Toronto.

17542. Sept. 18.—Approving revised location of C.P.R. Swift Current northwesterly branch, Sask., from mileage 93, to 111.9; and authorizing crossing of 25 highways.

17543. Sept. 21.—Authorizing C.P.R. to build additional track, north of main line, across public road west of Cache Bay station, Springer tp.

17544. Sept. 21.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to cross Turlow Ry., or Canada Cement Co.'s spur by a bridge in Thurlow tp., Ont., mileage 72.14.

17545. Sept. 20.—Relieving Michigan Central rd. from providing day and night watchman at crossing one mile west of Forks creek, Ont.

17546. Sept. 21.—Authorizing G.T.R. to build additional track across Wharf road, Bowmanville tp., Ont.

17547. Sept. 20.—Authorizing C. N. Pacific Ry. to build across C.P.R., near Lytton, B.C.

17548. Sept. 19.—Ordering G.T.R. to build station at Whitehall, Ont.

17549. Sept. 21.—Rescinding order 16460, which authorized C.P.R. to build spur for Inland Coal and Coke Co. at Merritt, B.C.

17550. Sept. 20.—Authorizing Progress rural municipality 351, Sask., to build highway over C.P.R. Macklin-Kerrobert line, between secs. 18 and 19, tp. 35, p. 23, w. 3 m.

17551. Sept. 20.—Authorizing city of Edmonton, Alta., to open Eighth street east, across Edmonton, Yukon and Pacific Ry.

17552. Sept. 21.—Ordering G.T.R. to restore joint rate per ton on brick from Bradford, Pa., to Windsor, Ont., in force prior to Apr. 20.

Birthdays of Transportation Men in October.

Many happy returns of the day to:—

R. A. Burford, cashier, C.P.R. ticket office, New York City, born at Brooklyn, N.Y., Oct 4, 1878.

T. C. Burgess, Commercial Agent, G.T.R., Minneapolis, Minn., born at New York City, Oct. 2, 1853.

G. E. Burns, Freight Claims Agent, Eastern Lines, C.P.R., Montreal, born at St. Thomas, Ont., Oct. 6, 1863.

K. J. Burns, Assistant General Freight Agent, Great Northern Ry., Vancouver, B.C., born at Rochester, Eng., Oct. 11, 1878.

F. F. Busteed, C.E., Engineer in charge of C.P.R. revision and tracking, west of Calgary, Kamloops, B.C., born at Battery Point, Que., Oct. 10, 1858.

C. E. Cartwright, M. Can. Soc. C.E., ex-Division Engineer, C.P.R., Vancouver, B.C., born at Toronto, Ont., Oct. 13, 1864.

G. S. Cooke, Superintendent, Grand Trunk Pacific Ry., Melville, Sask., born at Montreal, Oct. 27, 1875.

L. V. Druce, Commercial Agent, G.T.R. and G.T.P.R., Vancouver, B.C., born at London, Eng., Oct. 20, 1873.

C. E. Dewey, General Freight Agent, Grand Trunk Pacific Ry., Winnipeg, born at Cheshunt, Eng., Oct. 2, 1873.

J. Earls, ex-Secretary and Treasurer, Canadian Freight Association at Toronto, born in Ireland, Oct. 30, 1838.

C. E. Friend, General Auditor, Canadian Northern Ry., Winnipeg, born at Brighton, Eng., Oct. 12, 1871.

W. P. Fitzsimmons, Commissioner of Industries, G.T.R., Montreal, born at Detroit, Mich., Oct. 27, 1868.

A. H. Harris, Special Traffic Representative, C.P.R., Montreal, Que., born in Devonshire, Eng., Oct. 15, 1855.

G. Hodge, General Superintendent, Eastern Division, C.P.R., Montreal, born there Oct. 2, 1874.

J. H. Hughes, Assistant Superintendent, District 2, Eastern Division, Smith Falls, Ont., born at Charlottetown, P.E.I., Oct. 7, 1865.

J. W. N. Johnstone, General Passenger Agent. Reid Newfoundland Co., St. John's. Nfld., born at Campobello, N.B., Oct. 4, 1878.

S. Way Kent, Ticket Agent, C.P.R., Paris, Ont., born in Brant County, Ont., Oct. 23, 1879.

W. M. Kirkpatrick, Assistant Freight Traffic Manager, Eastern Lines, C.P.R., Montreal, born at Kingston, Ont., Oct. 8, 1874.

W. B. Lanigan, Assistant Freight Traffic Manager, Western Lines, C.P.R., Winnipeg, born at Three Rivers, Que., Oct. 12, 1861.

J. W. Leonard, Assistant to Vice-President, C.P.R., Montreal, born at Epsom, Ont., Oct., 1858.

C. F. Lunan, Assistant Commissary Agent, C.P.R., Calgary, Alta., born at Sorel, Que., Oct. 2, 1879.

Sir William Mackenzie, President, Canadian Northern Ry., Toronto, born at Kirkfield, Ont., Oct. 30, 1849.

W. T. Marlow, Import Freight Agent, C.P.R., Montreal, born at Limerick, Ireland, Oct. 25, 1872.

R. Marpole, General Executive Assistant, C.P.R., Vancouver, B.C., born in Montgomeryshire, Wales, Oct. 9, 1850.

H. Paton, President, Shedden Forwarding Co., Montreal, born at Johnstone, Renfrew, Scotland, Oct. 5, 1852.

D. Pottinger, I.S.O., Assistant Chairman, Government Railways Managing Board, Moncton, N.B., born at Pictou, N.S., Oct. 7, 1843.

H. G. Reid, Master Mechanic, C.P.R., North Bay, Ont., born at Pembroke, Ont., Oct. 27, 1863.

W. S. Rollo, joint agent, G.T.R., and Central Vermont Ry., St. John's, Que., born at Dundee, Scotland, Oct. 8, 1852.

J. K. Savage, Superintendent, District 1, Saskatchewan Division, C.P.R., Regina, born at Forreston, Ill., Oct. 5, 1876.

Sir Thomas G. Shaughnessy, K.C.V.O., President, C.P.R., Montreal, born at Milwaukee, Wis., Oct. 6, 1853.

T. Duff Smith, Fuel Agent, Grand Trunk Pacific Ry., Winnipeg, Man., born at Barking, Essex, Eng., Oct. 2, 1868.

A. B. Spence, Travelling Auditor, Reid Newfoundland Co., St. John's, Nfld., born at Harbor Grace, Nfld., Oct. 21, 1882.

E. Sterling, Superintendent, Districts 2 and 3, British Columbia Electric Ry., New Westminster, born at Thornbury, Ont., Oct. 3, 1875.

W. S. Taylor, ex-Treasurer, C.P.R., Montreal, born at Dornoch, Sutherlandshire, Scotland, Oct. 18, 1839.

E. N. Todd, Division Freight Agent, Eastern Division, C.P.R., Montreal, born at Huntington, Que., Oct. 17, 1879.

A. W. Wheatley, Manager, Canadian Locomotive Co., Ltd., Kingston, Ont., born at Ashford, Kent., Eng., Oct. 12, 1870.

L. H. Wheaton, Resident Engineer, Dartmouth branch, Intercolonial Ry., Dartmouth, N.S., born at Sackville, N.B., Oct. 5, 1866.

G. B. Wyllie, Travelling Passenger Agent, Illinois Central Rd., Buffalo, N.Y., born at Toronto, Ont., Oct. 15, 1855.

Railway Lands Patented.—Letters patent were issued during JJuly, covering railway lands in Manitoba, Saskatchewan, Alberta and British Columbia, as follows:

Canadian Northern Ry.	1,070.88
Canadian Pacific Ry. roadbed and station grants	203.62
Kootenay Central Ry.	4.25
Qu'Appelle, Long Lake and Saskatchewan Rd. and Steamboat Co.	2,736.37
Total	4,015.12

A press report from Calgary, Alta., states that the elevators owned by the Alberta Pacific Elevator Co., the West Coast Grain Co., and the Globe Elevator Co., have been sold to an English syndicate, headed by Sir Max Aitken. The total elevator capacity is given as 3,000,000 bush., the largest elevator included in the transaction being the last mentioned company's terminal at Calgary with a capacity of 400,000 bush.

Electric Railway Department.

Street Railway Construction on Granville Street, Vancouver.

By C. B. Vorce, Construction Engineer, British Columbia Electric Railway.

Granville street, Vancouver, B.C., is a principal business street, over which six car lines or about 150 cars an hour pass. The tracks on this street between Robson and Drake streets, half a mile, were riding so badly that their reconstruction was imperative. It was not advisable to rebuild during operation, and as there is a double track car line only two blocks away, the

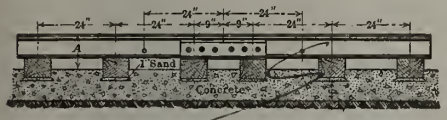


Fig. 1.—Longitudinal Section of Track.

Board of Public Works granted the company permission to abandon traffic during construction, providing it was restored in 24 days.

The street was paved with wood blocks laid on 6 ins. of concrete, and each rail of the double track was carried on a concrete girder 2 ft. wide and 15 ins. deep. Owing to the nature of the foundation these girders were not heavy enough to carry the weight imposed upon them and on account of this the company adopted the type of construction shown by figs. 1 & 2. This construction consists of a 6 in. concrete slab which is laid over the entire track allowance, 18½ ft. wide, upon which 91 lb. T rails 7 ins. high are laid on 6 x 8 in. by 8 ft. ties spaced 2 ft. centre to centre. The track was then surfaced to grade on a sand cushion averaging 1 in. deep and the concrete was brought up to the under side of the pavement. By referring to the standard cross-section, fig. 2, it will be seen that the bottom of the concrete slab is 20 ins. below the rail grade.

The reconstruction of the tracks called for taking out and replacing the following quantities: 5,100 sq. yds. of wood block paving, 10,200 lin. ft. of rail or 5,100 lin. ft. of single track, 1,800 cu. yds. or 5,100 sq. yds. of concrete, 600 cu. yds. of earth and the laying of 2,400 cu. yds. of concrete, one-half mile of double track, 850 sq. yds. of granite flangeway blocks and 4,250 sq. yds. of wood blocks.

As the concrete had to set 10 days before traffic could be turned back on the street, this necessitated the completion of the work above outline, except the paving, in 12 days, and not 14 days, as two Sundays intervened. The work was carried on day and night, and a schedule, fig. 3, was prepared showing the rate of progress which must be made on each of the operations in order that the work should be completed within the time limit. This schedule was so closely followed that all the work, except the paving, was finished one hour before the time called for by the schedule, and during the 10 days the concrete was setting the street was repaved so that when traffic was restored all the work was completed. The company has a large construction force, which does the greater portion of its work, so it was certain of the speed with which the various operations, with the exception of breaking up the concrete, could be accomplished.

The company had just built a piece of new track which called for the removal of about 300 sq. yds. of concrete of a similar nature, which had been laid by the same contractors. This piece of concrete was removed by hand and it took 15 men 6 days to do the work. As the schedule called for the removal of about 32 sq. yds. of concrete an hour, it was seen that some mechanical means must be used, and the following scheme was adopted:

The dipper arm was taken off the company's electrically driven automatic shovel and the pile driver leads, about 20 ft. long, were hung from the end of the boom, being held in position by two braces running back to the main frame of the shovel. A hammer weighing 2,600 lbs., with a wedge shaped cutting edge about 8 ins. deep running parallel to the track, was specially cast. The cutting edge was placed this way in order not to injure the remaining concrete in the street. This scheme worked excellently and no trouble whatever was found in breaking up the concrete as rapidly as it could be taken away.

The concrete breaker, which could swing through 350°, was placed on one track and on the other track the derrick car was

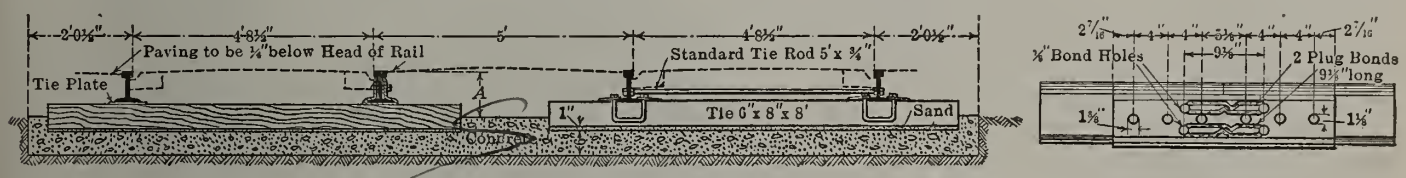


Fig. 2.—Cross Section of Track and Details of Bond Drilling.

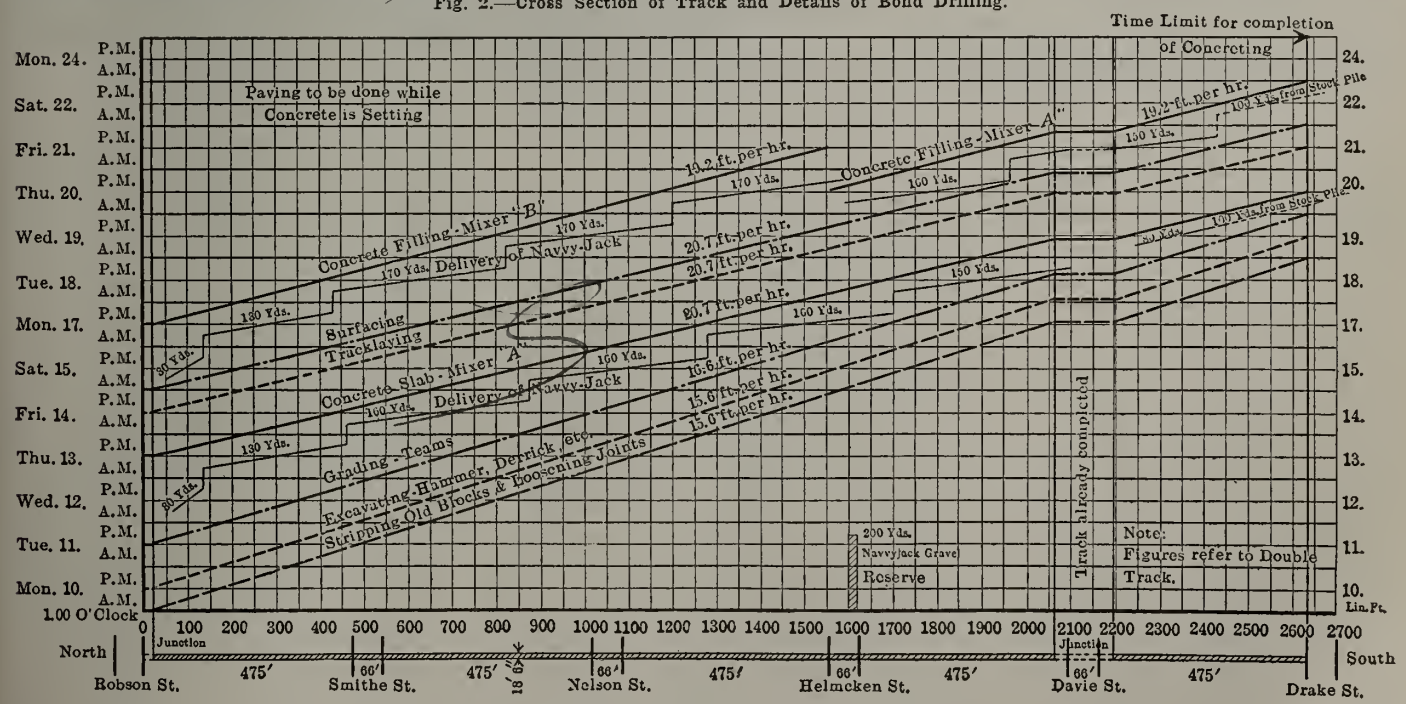


Fig. 3.—Chart Showing Progress of Work on Granville Street.

placed. This derrick car had a 60 ft. boom, which could also swing through 360° and could move itself up and down the track. This car was used to break up the larger pieces of concrete and load them on flat cars placed behind the concrete breaker, also to unload skips in which were placed the smaller pieces of concrete and earth, this material being dumped into wagons standing alongside. The concrete breaker and derrick car backed up on the old track as soon as the concrete was broken up for a rail length ahead of them.

The price of common labor was $3 a day of 10 hours, and teams received $8 a day shift of 10 hours and $9.50 for night shift. The average haul for teams was ¾ of a mile and for the track cars about 2 miles. The cost of the work was as follows:

Digging up wood blocks, 8 9-10 cts. per sq. yd.

Tearing up old track, 11 cts. per ft. of single track.

Breaking up concrete, 40 cts. per sq. yd., or $1.13 per cu. yd.

Excavation, loading and dumping, 82½ cts. per cu. yd.

Removing material by teams and work train, 65 cts. per cu. yd.

G. R. G. Conway, M. Can. Soc. C. E., is Chief Engineer of the B.C.E.R. Co., and the work was carried on under the supervision of C. B. Vorce, M. Am. Soc. C. E., Engineer of Construction, assisted by H. J. Tippet, Engineer Maintenance of Way, and A. J. Kennedy, Roadmaster.—Engineering and Contracting.

Handling Interurban Traffic With Trailer Cars.

As shown in the accompanying illustration of cars on the London and Lake Erie Ry. and Transportation Co.'s line between London and Port Stanley, Ont., the trailer system of handling dense traffic has been introduced this summer. Earlier in the year, two motor cars and two trailers were purchased in the United States, the design of which may be noted in the illustration. These cars are 50 ft. long, with a seating capacity of 58 people each. The motor equipment of each motor car is four 50 h.p. motors, two on each truck.

The cars, both motor and trailer, are rather unusual in body design, as the roof is of the arch type without a clerestory and deck sash along the sides. This makes a lighter construction that is both simpler and very pleasing to the sight. Both ends of the cars are completely enclosed, and have side doors with traps over the steps. The conductors and motormen have instructions to see that both are properly closed before putting the cars in motion when handling crowds, accidents being thereby largely prevented. The motor cars have centre doors at the ends leading out to the vestibules, which are at the same level as the body of the car, it being considered that such a design strengthens the body considerably for the trailer haul, as the centre sill is continuous. In the trailers, the vestibules are integral with the body. This permits of more space being available when the traffic is heavy. Extra precautions have been taken to prevent any injury to passengers from falling between the motor and trailer. It is for this reason principally that the ends of the trailer are enclosed. The end windows have cross bars at a convenient height for resting the elbows.

Another especial feature of the design is the efficient placing of the seats. The walls between the side posts are made particularly thin, and into the recess thus formed, the seats are set. With the windows open and the elbows resting on the sill, the passenger is able to sit up very close, leaving ample space for the occupant of the inner seat without the latter sitting half out over the aisle as in the usual design of cars. The fact that the seats are set into the space between the side posts gives an additional width to the centre aisle of some six inches, giving a particularly clear passageway down the centre, which is of particular value when a big crowd is being handled.

No tests have been made as regards efficiency of the motor when operating alone, as compared to the former two-motor cars, but experience elsewhere would seem to demonstrate that it is as economical as the latter. When operating with trailers, these four-motor cars have been able to stand up in the schedule with the tw-motor cars, and have given no trouble.

A new feature in the cars is the application of the combination air hose coupler, in which the two air connections to the trailer from the motor are made automatically by the coupler, the air connections being right in the side faces of the couplers, which are of an unusual design.

The cars are intended primarily for summer operation when the traffic from London to Port Stanley, the southern terminus of the line at Lake Erie, is particularly heavy. Provision has been made for their operation in the winter, when required, as they are all equipped with heaters and ventilators.

London and Lake Erie Railway and Transportation Co. Trailer Operation.

Electrification on the New York, New Haven and Hartford Railroad.

The N.Y., N.H. & H. Rd. is to be electrified between Boston, Mass., and Providence, R.I. The work will be done by equipping four tracks with the same single phase catenary system now in use at the New York end of the system. It is further stated that several tracks at the south station in Boston will be equipped for electrical operation, and that legislation permitting the construction of the much discussed tunnel between the New Haven and the Boston and Maine systems will be strongly urged. This very important extension of electric operation on the New Haven road indicates that in all probability there will be through electric service from Boston to New York before many years have passed. There are difficulties in the way of this which have nothing to do with electrification, except indirectly. Grade crossings must be eliminated, for instance, and it is very desirable to have substantial reductions in grade before electrification is inaugurated. Such work has already been done on the section from Boston to Providence, and consequently it is expected that the electrification of that line can be completed during 1913, including a large generating station at Providence and another at Readville, Mass. From Providence to New Haven the present conditions are not so favorable for electric operation, however, and it is likely that before the steam operation of passenger trains is abandoned there electric operation on the two ends of the road will be pretty well standardized.

Automatic Signalling and Train Dispatching in Indiana.

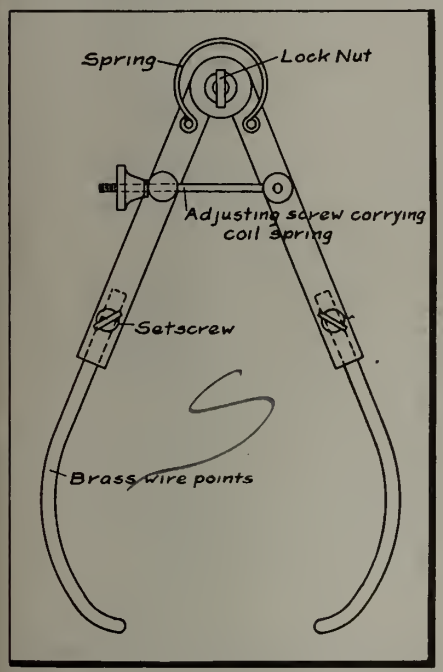
After a thorough examination of the Simmen system of railway signalling and train dispatching as operated for the last three months on 18 miles of the Indianapolis and Cincinnati Traction Co.'s lines, official approval has been granted by the Railroad Commission of Indiana for its continued use. The traction company is ordered to install and have the same system in operation by Dec. 31, on its Indianapolis-Greensburg division from the junction at Indianapolis to Greensburg. In connection with this order, the Commission recommends to the traction company that any further improvements and developments of the Simmen system, which are to be made under the direction of the Commission and its block signal inspector, should have special reference to such arrangements of the apparatus that it will be impossible for trains in one direction to receive signals intended for trains running in the other.

In view of the Commission's approval the traction company has advised the manufacturer of this system, Northey-Plummer, Ltd., Toronto and Indianapolis, that it has decided to have all of its lines equipped at once with the system. For the present, until its lines are extended, one dispatcher will operate the entire system, although later it may be found necessary to have the services of two dispatchers. It is the company's intention to have its entire system, comprising 107 miles, equipped by Dec. 31.

Trackless Trolleys for Shunting.—An interesting application of trackless trolleys is being made at Altona, Germany, for the shunting of freight cars. The fireless locomotives in use since 1909 are being replaced by trackless tractors operated by means of trolleys pressed by a rigid rod against a double pole overhead line. The trolley, arranged on the roof of the tractor, is designed for deviating on either side to a maximum distance of 11½ ft., so as to allow the tractor to travel on either track. A single overhead line thus suffices for the shunting service, and the loading of cars is not interfered with. The tractor, which weighs 6 tons, has been designed for handling up to 6 cars with their full load at a speed of 1.86 to 3.73 miles, and is worked by a 25 h.p. continuous current motor at 550 volts, driving all four wheels through a 10:1 worm gear. The coupling device is operated from the driver's stand, so that the brakeman need not pass between the buffers. The shunting line is ¾ mile long, and reaches as far as the boundary of Hamburg.

Non-Magnetic Calipers at the London Street Railway Shops.

Machinists employed on the repair of motor parts are all familiar with the trouble usually experienced from the tools employed becoming magnetized and their sensitiveness thereby greatly decreased, unless extra precautions are taken to counteract any of the bad effects resulting. This is especially true of calipers. When turning down say a motor axle, the calipers may feel as if they are gauging correctly over the sides of the axle, when in reality, the calipers are set larger than the diameter of the shaft just calipered and considered correct. This deception arises from the fact that the axle, being strongly magnetized, draws one or other of the caliper points towards it, with the other point free from the side of the axle entirely. Yet at the same time, the calipers will feel as if they are correctly set over the axle, as when they are drawn across, the touching point drags so heavily, from the fact that it is magnetized, that the operator is deceived into believing they are correctly set, when,



Non-Magnetic Calipers, fitted with Brass Points.

as a matter of fact, they are only approximating the diameter by as much perhaps as ⅛ in. Any error above that would no doubt be detected by the eye.

The calipers shown in the accompanying illustration were made by H. Hussey, machinist in the London (Ont.) St. Ry. shops, to overcome the difficulties just outlined. The upper ends are made ½ in. square, with the upper ends locked ¼ in. lock nut. Looping over the top from leg to leg, there is a spring to keep the legs normally apart. Adjustment is obtained from an adjusting screw, carrying a coil spring between the leg pins. In the lower ends of the legs there are inserted flattened pieces of brass wire, secured by set screws. These brass wires are bent to the shape of caliper ends, with the points rounded. With such an arrangement, no trouble at all is experienced from magnetization, brass being a non-magnetic metal.

The Regina Municipal Ry. on Saturday, Aug. 31, carried 10,800 passengers, the largest number carried on any ordinary day since the line was opened.

Electric Railway Finance, Meetings, Etc.

British Columbia Electric Ry.—Gross earnings for July, $538,840; operating expenses, $333,045; net operating earnings, $205,795; renewal funds, $51,502; net earnings, $154,293; approximate income from investments, $35,000; net income, $189,293, against $409,330 gross earnings; $258,265 operating expenses; $151,065 net operating earnings; $38,012 renewal funds; $113,053 net earnings; $25,000 approximate income from investments; $138,053 net income for July, 1911.

Calgary Municipal Ry.—Passenger earnings for Aug., $56,813.90; miscellaneous earnings, $817.85; total earnings, $57,631.75; operating expenses, $33,349.46; balance, $24,282.29; contingent account and interest and sinking fund, $8,144.91; net profits, $16,137.38, against $35,513.55 passenger earnings; $425.80 miscellaneous earnings; $35,939.35 total earnings; $18,232.29 operating expenses; $17,707.06 balance; $7,060.30 contingent account and interest and sinking fund; $10,646.76 net profit, for Aug., 1911.

Cape Breton Electric Co.—Gross earnings for July, $33,115.85; operating expenses and taxes, $16,973.96; net earnings, $16,141.89; interest charges, $4,495.83; balance, $11,646.06; sinking and improvement funds, $1,206.67; balance for reserves, etc., $10,439.39, against $31,215.49 gross earnings; $16,384.68 operating expenses and taxes; $14,830.81 net earnings; $4,512,50 interest charges; $10,318.31 balance; $1,140 sinking and improvement funds; $9,178.31 balance for reserves, etc., for July, 1911. Construction charges for month, $3,468.29.

Halifax Electric Tramways Co.—Press reports from Halifax, N.S., state that the majority stock of this company has been acquired by E. A. Robert, President Montreal Tramways Co., and associates, and that the other shareholders will be offered 160 for their stock. Railway traffic receipts for Aug., $26,140.26, against $25,594.16 for Aug., 1911.

London St. Ry.—Gross earnings for July, $28,205.35; expenses, $18,711.63; net earnings, $9,493.72; deductions, $2,450; net income, $7,043.72; for August, gross earnings, $27,551.52; expenses, $18,071.52; net earnings, $9,480; deductions, $2,450; net income, $7,030. Aggregate gross earnings for eight months ended Aug. 31, $197,565.29; expenses, $138,285.20; net earnings, $59,280.09; deductions, $19,268.50; net income, $40,011.59.

Toronto Ry., Toronto and York Radial Ry., and allied companies.—Gross earnings for July, $712,456; operating expenses, maintenance, etc., $329,607; net earnings, $382,849, against $630,663 gross earnings; $296,723 operating expenses, maintenance, etc.; $333,940 net earnings, for July, 1911. Aggregate gross earnings for seven months ended July 31, $4,725,174; net earnings, $2,418,921, against $4,198,956 aggregate gross earnings; $2,139,145 net earnings, for same period 1911.

Winnipeg Electric Ry.—Gross earnings for July, $315,362; operating expenses, $163,930; net earnings, $151,432, against $322,751 gross earnings; $152,108 operating expenses; $170,643 net earnings, for July, 1911. Aggregate gross earnings for seven months ended July 31, $2,124,066; net earnings, $992,562, against $2,204,357 aggregate gross earnings; $1,096,193 net earnings for same period 1911.

Personal Paragraphs.

B. L. JONES, who has been General Manager and Treasurer of the Niagara Gorge Rd., Niagara Falls, N.Y., and the Lewiston and Youngstown Frontier Ry., has been appointed Vice-President and General Manager of both companies.

V. E. HAVENS, heretofore General Superintendent, Oswego Division, Syracuse, Lake Shore and Northern Rd., has been appointed Acting General Manager, Buffalo, Lockport and Rochester Ry., with office at Rochester, N.Y.

E. S. FASSETT has resigned the General Managership of the United Traction Co. of Albany, N.Y., to go into business.

Calgary Municipal Railway Scenic Car.

The Calgary Municipal Ry. Scenic Car, an illustration of which appears on this page, and which was adopted on the recommendation of T. H. McCauley, Superintendent, has proved more profitable than was anticipated. One hour trips are run over different routes for six or eight hours, on fine days, and the car is accompanied by a conductor who describes the points of interest to the passengers. A charge of 25 cents a passenger is made for the trip. The car, which cost $7,500, was built by the Preston Car and Coach Co.

The Regina city council is reported to be considering the purchase of an additional eight cars.

The joint board operating the Port Arthur and Fort William Electric Ry. has reported to the Port Arthur city council on the necessity of purchasing six or seven more cars, and a snow plough. The council referred the matter to the Commissioner of Public Utilities.

The Quebec Public Utilities Commission announced Sept. 10, that by November there will be only 454 single truck cars in operation in Montreal, as the Montreal Tramways Co. is complying with the Commission's order not to build any more, and to retire those in service at the rate of 50 a year. The Commission is also enforcing an order that all cars over 30 ft. long, and weighing more than 25,000 lbs., shall be fitted with air brakes, and that all cars operating on severe gradients shall be equipped with an emergency brake.

Electric Railway Projects, Construction, Betterments, Etc.

Bassano Electric Power and Development Co.—We are advised that the proposition for the building of a electric railway from Bassano, Alta., is probably "past history." It is expected that the franchise granted to Mr. Whiting has been lost, and that nobody else would care to take up "such a proposition as running an electric car from Bassano to the C.P.R. dam, unless it be the C.P.R." At any rate there is no vitality in the proposition at present. (June, pg. 308.)

Battleford, Sask.—A proposition was submitted to the city council of Battleford, Sask., Sept. 2, by —. Fitzgerald, on behalf of a British syndicate, for the building of an electric railway in the city. The matter is under consideration.

Berlin and Northern Ry.—A bylaw authorizing the expenditure of $6,000 towards the cost of a county bridge across the Grand river at Bloomingdale, Ont., in connection with the extension of the old Berlin and Bridgeport Electric Ry., was passed by the Berlin town council, Aug. 31. (Aug., pg. 421.)

Brandon, Man.—Track laying is being proceeded with on the municipal electric railway lines being built in the city. The first section of line to be laid is on Princess ave. and First st. easterly to Frederick st., at which point a connection is being made with the track previously laid on Rosser ave. (Aug., pg. 421.)

The British Columbia Electric Ry. moved its headquarters staff to its new office block at Hastings and Carrall streets, Sept. 3.

A cable has been received from the directors in London, Eng., to the effect that the very best terms upon which the company is prepared to negotiate for a consolidation of franchises in Greater Vancouver, has already been submitted, and that they are unable to consider any arrangement which would modify those terms.

Press reports state that construction is to be started at once on the extension of the Fraser st. line in South Vancouver to River road, and that plans for an extension from Clayburn to Mission City are under consideration.

The British Columbia Minister of Railways has approved of general location plans for a line from Port Moody northeasterly to the Vancouver Power Co.'s Coquitlam dam.

The Puget Sound Bridge and Dredging Co., Seattle, Wash., has closed a contract with the B.C.E.R. Co. for the construction of a large dam on Jordan river. The dam will form a part of the Jordan river hydro-electric system, which the B.C.E.R. Co. is developing to secure an output of 36,000 h.p. The dam will be 800 ft. long and 115 ft. high. It will be of the Ambursen type of construction, this form having been selected by G. R. G. Conway, Chief Engineer of the B.C.E.R. Co. in preference to a solid concrete construction. The contract calls for an expenditure of approximately $500,000. Preliminary operations have been started and it is expected the work will be completed in eight months.

The Board of Railway Commissioners has authorized the opening for traffic of the second track from 24th Ave., Point Grey to Eburne, 4.5 miles.

The Board of Railway Commissioners has authorized the Vancouver and Lulu Island Ry., which is operated under lease from the C.P.R., by the B.C.E. Ry., to lay its second track across 22 streets and avenues in Vancouver. (Sept., pg. 468.)

Burrard, Westminster, Boundary Ry. and Navigation Co.—W. McNeill, chairman of the board, is reported as having stated, Sept. 12, as follows:—That construction of the projected electric line between Slave river and Pitt river, B.C., will be started next year; that the further surveys necessary to carry the line from Pitt river into Vancouver are to be started at once; that he had been in consultation with the Provincial Minister of Railways in reference to the building of a single track across the Pitt river, with turnouts at each end, and a draw span to permit of navigation; that the substructure would be built so as to permit of the widening of the bridge to carry a second track, as well as to provide for ordinary traffic; that the bridge work will be started in the spring, and will be completed in a year thereafter; that it is expected to complete the line early in 1915, and that it will be operated by electricity supplied by the Western Canada Power Co., which holds the charter. (May, pg. 251.)

The Dunnville, Wellandport and Beamsville Electric Ry. Co. has a charter to build a line from Port Dover, across the Niagara peninsula to St. Catharines, Ont. The route surveyed shows a line from Port Dover to Dunnville, where connection will be made with the G.T.R.; thence to Moulton, connecting with the Michigan Central Rd., and Wabash Rd.; thence to St. Anns, connecting with the C.P.R. and Toronto, Hamilton and Buffalo Ry., thence to Beamsville and St. Catharines. The company has also power to build branch lines to Welland, 12 miles; to Jordan harbor, 3 miles, and to Port Maitland, 4 miles. The entire country through which the line runs is very level, with the exception of the Niagara hill at Beamsville, where the maximum gradient is 3%, and the country from Jordan to St. Catharines is rather more difficult. The average gradient throughout the line is ½%. The main line has been located on a private right of way practically for the whole distance, and the right of way, from Dunnville to St. Anns, with the exception of two or three parcels, has been acquired. This section of the line will be 16 miles long, and the municipalities have voted $20,000 towards its construction. Construction is said to be well advanced, and it is expected to have the 16 miles completed and in operation by the end of the year. The construction is equal to that of steam roads, and the bridges are built to carry the largest freight cars weighing, when loaded, 148,000 lbs. It is intended to operate gas-electric motor cars over the line.

The company has a capital of $400,000, and is empowered to issue bonds to the amount of $20,000 a mile for the whole line, with an additional $10,000 a mile for the section from Jordan to St. Catharines. An issue of 5% bonds in denominations of $100, $500 and $1,000, with a bonus of an equal amount of common stock, is now being made.

The officers and directors are:—President and General Manager, J. A. Ross, Wellandport, Ont.; Vice President, A. McLaren, St. Catharines, Ont.; other directors:—C. W. Barwell, Port Dover, Ont.; J. W. Holmes, Selkirk, Ont.; W. Young, Ottawa; Secretary, M. R. Camphell, Wellandport, Ont.; Solicitors, J. R. Roaf, Toronto, and Bradford and Bradford, Dunnville, Ont. (Sept., pg. 468.)

Hamilton, Ont.—A proposition has been submitted to the city council by A. M. Snyder for the building of an electric railway from King and Catharine streets to the mountain top, to be operated by hydro-electric power. The line can only be built if the Hamilton Street Ry. fails to build such a line if called upon to do so by the city council. (Sept., pg. 468.)

Hamilton Street Ry.—Application is being made to the Hamilton, Ont., city council for power to extend the line along King st. west, to a new industrial suburb which is being opened up. (June, pg. 308.)

Lake Erie and Northern Ry.—We are officially advised that no tenders have yet been accepted for the building of the line; however, it is expected to start work on the construction of the Brantford-Galt section this season. It is intended to build and operate the line temporarily as a steam road, pending a decision as to the system of electric operation to be adopted.

The line will extend from Port Dover via Brantford to Galt. The location plans show a maximum gradient of 1% and a maximum curvature of six degrees. The cut and fill work will average about 20,000 cubic yards a mile. There will be two large bridges on the line, one 450 ft. long, the other 438 ft. W. P. Kellett, Brantford, Ont., is Chief Engineer. (Sept., pg. 468.)

Lethbridge Municipal Ry.—The electric railway in Lethbridge, Alta., was put in operation Aug. 18, with a temporary power installation. The generator broke down after three days' operation, and as it was impossible to make repairs, traffic was stopped. The service will not be resumed until the permanent power plant has been installed. The machinery is in course of delivery. (Sept., pg. 468.)

London and Northwestern Ry. of Canada.—London, Ont., press reports state that the Mackenzie, Mann and Co. interests have acquired the charter rights of this company, which has power to build an electric railway from London to Sarnia, Ont. D. A. Stewart, London, Ont., is principally interested. (April, pg. 196.)

London, Street Ry.—C. B. King, Manager, is reported as stating that the second track work on several lines is well in hand, and that it is expected to have it finished by Dec. 1. The question of the removal of the line on Wellington st. is still under consideration. (Aug., pg. 421.)

Montreal and Southern Counties Ry.—A franchise for the operation of a street railway in Granby, Que., has been granted to the company by the city council, and press reports state that construction will be started shortly. (Sept., pg. 468.)

Montreal Tramways Co.—We are officially advised that the press reports stating that the company has spent $500,000 in buying a right of way from Henderson station to the city limits, a distance of about two miles, and that a stub line is to be built along it, are incorrect. (Sept., pg. 468.)

Moncton Tramways, Electricity and Gas Co.—We are officially advised that a car service was started over a section of the Moncton and Buctouche Ry. (a steam line) Sept. 10. The cars are run along Harper St., from the King St. line, in Moncton, to the M. and B. Ry., thence along that company's tracks through Lewisville, Sunny Brae and Humphreys, N.B. With regard to the proposed loop line in the city, we are officially advised that nothing has been decided.

A meeting of shareholders was held at Moncton recently for the purpose of confirming a bylaw passed by the directors authorizing the issue and sale of a portion of the unissued capital stock at a discount, in connection with the sale of certain bonds or debentures. (Sept., pg. 468.)

Morrisburg and Ottawa Electric Ry.—At a special meeting of shareholders in Ottawa, Aug. 29, J. G. Kilt, R. J. Biggar, Ottawa; and J. W. Bogert, Morewood, Ont., were added to the directorate. R. A. Bishop resigned from the directorate, but retains his position as Secretary-Treasurer. The plans

for the entrance of the line into Ottawa were under consideration, but no decision was reached. One of the directors is reported as stating after the meeting that no proposition had been made for an amalgamation with the Ottawa and St. Lawrence Electric Ry. (Sept., pg. 468.)

Niagara, St. Catharines and Toronto Ry.—The Board of Railway Commissioners has approved of location plans of the extension of the line from the crossing of the Welland canal, St. Catharines, mileage 0.75, to Niagara-on-the-Lake, Ont., mileage 11.

We are officially advised that construction will be started at once on the building of the new line from St. Catharines to Niagara-on-the-Lake, the location plans for which have been finally approved by the Board of Railway Commissioners. It is expected to have the extension ready for operation early in 1913. (Aug., pg. 421.)

Niagara, Welland and Lake Erie Ry.—The Board of Railway Commissioners has approved of location plans for the line in Welland, Ont., including crossings of the G.T.R. and Michigan Central Rd. (Aug., pg. 421.)

Nipissing Central Rd.—The location plans of the extension of the line from Haileybury to New Liskeard, Ont., have been approved by the Board of Railway Commissioners.

The Cobalt town council, Sept. 4, approved of the company's proposal to connect its line with the Timiskaming and Northern Ontario Ry. at North Cobalt and to run its cars over the steam railway tracks to Cobalt station. (Aug., pg. 421.)

Regina Municipal Ry.—Good progress is reported to have been made on the extensions of the electric railway in Regina, Sask. Steel was expected to be laid on Dewdney St.-Mounted Police barracks section, and on the Victoria Ave. section by the end of September, and substantial progress has been made on other sections. Supt. Doughty is preparing plans for building further extensions during 1913. Press reports state that the plans will provide for the expenditure of about $600,000 on new construction.

A proposition is under consideration by owners of real estate for the building of about six miles of line, the same to be handed over to the city for operation on completion. (Aug., pg. 421.)

Ottawa Electric Ry.—The Ottawa city council was informed Sept. 6 that the company proposed to start work on several extensions in the spring of 1913. (June, pg. 309.)

Ottawa, Rideau Lakes and Kingston Ry.—Press reports state that surveys are to be made at once for the building of a branch from the projected main line at Lombardy, to Perth, Ont. The cost of the work will, it is said, be borne by the municipalities. (Sept., pg. 468.)

Port Arthur and Fort William Electric Ry.—The ratepayers of Port Arthur, Ont., passed bylaws Sept. 16 to issue debentures as follows:—$4,300, to extend the electric railway on Queen st., from Algoma st. to High st.; $2,600, to extend the electric railway from its present eastern terminus to Hodder ave.; $34,000, to extend the electric railway easterly to Hedge siding; $32,200, to construct a belt line electric railway; and $12,500, to open up a new street from Hodder ave. to Hedge siding, in connection with the second and third of the proposed extensions. (Sept., pg. 468.)

Sandwich, Windsor and Amherstburg Ry.—The Walkerville, Ont, town council has granted the company permission to lay a second track on Wyandotte st., from Kildare road, to the western limits of the town. (July, 1911, pg. 685.)

Saskatoon Municipal Ry.—We are officially advised that the contract entered into between the city and the Stone and Webster Engineering Co., Boston, Mass., provides for the building of 12 miles of single track in the city; the installation of two 300 k.w. motor generator sets, together with the necessary switchboard apparatus, etc., in the present power station, and the construction of a brick and timber car barn for 18 single truck cars. (Aug., pg. 422.)

Simcoe Ry. and Power Co.—We are officially advised that the company has developed a water power at the Big Shute on the Severn river, and is transmitting power to Midland, Penetang and Orillia, Ont. It is proposed to build a transmission line to Collingwood, Barrie and other points. At present a duplicate transmission line is being built from the Big Shute to Waubaushene. Nothing has been done under the company's railway charter, and another officer of the company adds, "There is nothing doing." (Sept., pg. 468.)

Stratford St. Ry.—It is said that the negotiations between the Mackenzie, Mann & Co. interests and the company have been abandoned, owing to failure to come to terms with the Hydro-Electric Commission as to power, and that an endeavor is to be made to secure a new franchise from the Stratford, Ont., city council. (July, pg. 368.)

Toronto and York Radial Ry.—The Toronto city council is taking steps to take over the portions of the company's lines within the city limits in East Toronto, and on the Lake Shore road, at the expiration of the franchises in November. (Aug., pg. 422.)

Toronto Eastern Ry.—We are officially advised that about seven miles of grading have been completed west of Bowmanville, and that it is hoped to have the grading and track laying from Bowmanville to Pickering completed this year. (Sept., pg. 468.)

Toronto Suburban Ry.—Plans are under consideration for the laying of a new single track line on Pacific ave., to Dundas st., West Toronto. The whole of the company's existing lines are, it is said, to be relaid to standard gauge.

Considerable grading has been done on the extension west of Islington, but progress is not so rapid as was anticipated owing to difficulties in acquiring the right of way, and the scarcity of teams and men. No further sub-contracts have been let by Ewan Mackenzie, the general contractor. (Sept., pg. 468.)

Winnipeg Electric Ry.—We are officially advised that the company is extending its tracks on Broadway, Winnipeg, from Osborne st. to Sherbrooke st.

The municipality of St. Vital, Man., has granted a franchise to the company for 30 years, for the operation of an electric car line, which must be in operation to St. Vital road by Nov., 1913, and completed throughout the municipality by Nov., 1914.

The Winnipeg Electric Ry., which owns the Winnipeg, Selkirk and Lake Winnipeg Ry., has secured from the Winnipeg city council, the right of way of the city's line to Stony Mountain, Man. Additional land has been secured to connect the company's line with the newly acquired property, and for the extension of the line to Stonewall, a total distance of 17 miles. Press reports state that work is to be started at once on the building of the line, as the agreement with Rockwood municipality calls for operation of cars by Dec. 1. (Aug., pg. 422.)

The Quebec Ry., Light, Heat and Power Co.'s employes' annual picnics were held at Cape Tormente, Sept. 15 and 22.

Electric Railway Notes.

The Hamilton city council is calling upon the Hamilton Street Ry. to add about a dozen new cars to its rolling stock.

The Sarnia, Ont., Street Ry. began reoperating its line Sept. 11, after having been out of business for six weeks owing to the destruction of the power house.

The Grand Valley Ry., which has not been operated in its entirety since March, is again running its cars over the whole line from Brantford to Galt, Ont.

The Winnipeg Electric Ry. has been declared by a decision of Chief Justice Mathers to possess all the rights of the Manitoba Electric and Gas Co., so far as the city of Winnipeg is concerned.

The Lethbridge Municipal Ry. has received five single truck city cars, equipped with Westinghouse 101-B-2 motors, single end operation, with pay-as-you-enter vestibules at the rear ends, from the Preston Car and Coach Co.

The Lethbridge Municipal Ry. was only able to run its cars for three days, Aug. 18 to 21, owing to the breakdown of the temporary power plant. The passengers carried numbered 15,082, and the receipts were $1,037.35.

The Guelph Radial Ry. has ordered a standard long broom, single truck, snow sweeper, with standard steel underframe, steel tired wheels, double end control, equipped with Westinghouse 101-B-2 motors, from the Preston Car and Coach Co.

The New Brunswick Board of Public Utility Commissioners has approved of the following rates of fare on the Moncton Tramways Electricity and Gas Co.'s line: Single fares, 5c.; ordinary tickets, 6 for 25c.; workmen and children's tickets, 8 for 25c.

F. C. Clarke, of New York, has been appointed Chief Engineer, Toronto Ry., Toronto Power Co. and Electrical Development Co. of Ontario, succeeding W. H. Fisher, who has been acting temporarily since W. B. Boyd resigned a short time ago.

The Montreal Tramways Co., by one of its shareholders, has entered an action with a view of preventing the city carrying out a contract with the Canadian Autobus Co., on the ground that the M.T.C., as owning the Montreal Street Ry., should have the option of refusing to enter into such a contract.

In fining the driver of a team for obstructing an electric car at Regina, Sask., Sept. 9, the police magistrate found that the driver had an opportunity of turning out before he did, but expressed the opinion that the cars had not an exclusive right of way on any street in the city. The electric railway is owned by the city.

The city of Saskatoon, Sask., has ordered 12 single truck motor passenger cars in the U.S., for its municipal railway. They will measure 34 ft. 4 ins. over bumpers, 21 ft. 4 ins. over corner posts, and will be equipped with electric heaters, electric bell ringer system, reversible rattan cross seats, headlights, window guards, storm sash, curtains, hand straps, registers, destination signs, trolley catchers, life guards, trackscrapers, and mounted on no. 72 single trucks.

The Regina, Sask., city council's street railway committee recommends the purchase of the following rolling stock for 1913 delivery:—Eight double truck cars at $6,500 each; six single truck cars at $4,500 each; one snow sweeper, $4,100; one 5,000 gal. sprinkler, $6,000; six gravel dump cars at $700 each; 18 garbage cars at $450 each; 4 construction flat cars at $1,000 each, and 1 construction motor car, 28 ft. long, $2,500.

Marine Department.

The Canadian Pacific Railway's New Trans-Pacific Steamships.

The first of the two steamships which are being built as additions to the C.P.R. Co.'s trans-Pacific fleet, the Empress of Russia, was launched at Glasgow, Scotland, Aug. 28, the christening being performed by Mrs. H. W. Beauclerk, of Montreal, eldest daughter of Sir Thos. Shaughnessy, the C.P.R. Co. being represented by G. McL. Brown, European Manager, in the unavoidable absence of A. Piers, Manager of Steamships, who was in Canada at the time. The second vessel, the Empress of Asia, will probably be launched in October.

These vessels will connect with the C.P.R.'s western terminus at Vancouver, and will steam direct to Yokohama, thence to Kobe and Nagasaki, where bunkers will be replenished for the round trip to Shanghai, Hong Kong, and back. Coal will again be shipped at Nagasaki for the return trip via Kobe and Yokohama to Vancouver. This programme involves very large radius of action, the distance between Vancouver and Nagasaki being over 5,000 nautical miles. The problem of carrying sufficient coal for a high rate of speed for so long a distance, together with adequate allowances of space and weight of cargo, passengers, stores and fresh water, is a serious one, especially in view of the decision to increase the sea speed from the 16 knots of the present services to 18 knots for the new vessels. The present trans-Pacific traffic was until recently carried on by the three screw vessels, Empress of China, Empress of India and Empress of Japan, each 450 ft. long and of about 6,000 tons gross register and built in 1891. The Empress of China was wrecked some few months ago, leaving only the two other vessels on the route.

These two new vessels, which will be ready to go into service early next summer, are very much larger than any of the present fleet, being 590 ft. long, 68 ft. beam, and 46 ft. deep, with about 15,000 gross tonnage. The turbine system of propulsion has been adopted by the C.P.R. for the first time, in these vessels which are to be propelled by four screws by four sets of turbines, and will have an average speed of 18 knots an hour. They will embody all the latest improvements, both for the safety and comfort of passengers. On a load draught of 29 ft. they will carry ample coal for the trip from Vancouver to Nagasaki, together with about 3,000 tons of cargo deadweight, and 1,500 tons of passengers, baggage, stores and fresh water.

In the construction of these vessels a radical departure from the current structure has been made in building them with cruiser sterns and the rudders entirely underhung. This form of stern, besides giving the vessels a very distinctive appearance, increases the effect of length of water line, thereby assisting propulsion, and also adds considerably to the available deck space at the after end. They will have five decks and in addition a long combined forecastle and bridge deck. Above the bridge deck will be located the principal first class public rooms, with the officers' quarters and navigating bridge overhead. In the dining saloon tables will be arranged to suit the demands of various passengers. Very small tables will be provided to accommodate two and four persons and larger ones for parties of six will be arranged in alcoves, while there will be still larger tables for other parties.

Accommodation will be provided for 200 first class, 100 second class and 800 third class passengers, the two latter classes being for Asiatics. A number of single as well as double berth rooms will be provided so that the growing class of passengers who desire privacy can be taken care of. There will also be a number of suites consisting of bed room, sitting room and bath room. Besides the usual spacious dining saloon, lounge, cafe, library and writing room, a large gymnasium will be provided on the upper deck. It is to be fitted up with a large variety of exercising machines. Another feature adopted for the first time will be the laundry, which will be found of great convenience, especially in the hot weather on the Chinese coast.

The hold, orlop and lower decks beyond the machinery spaces will be arranged to carry general cargo. On the main deck forward the ship's mail room will be fitted the full breadth of the ship, and spaces for portable steerage or cargo. Amidships on this deck will be stowed the ship's stores

The vessels will have a double bottom, orlop, lower, main, upper and shelter decks. Above the latter there is to be a long, combined forecastle and bridge, the bridge deck gating bridge over. There will be two pole and cold chambers; abaft this will be accommodation for stewards and firemen. Between the firemen's quarters and the stern, provision will be made for carrying valuable cargoes of silk. Five hundred Asiatic steerage, in suitably divided compartments, large airing and dining accommodation, ample cooking and pantry space, and commodious wash places will be arranged for on the upper deck aft and amidships on the port side. On the starboard side aft of amidships staterooms for four persons will be fitted up for second class passengers. Forward of these on the same side will be a number of rooms for first class passengers. The upper deck forward will be taken for the accommodation of seamen and petty officers. On the shelter deck just forward of midships will be the first class reception room and cafe, 44 by 64 ft., with large embarking gangways on either side of the ship. Access to all the first class accommodation and public rooms will be gained from this reception room. Immediately forward on this deck will be large staterooms for two and three persons. Adjoining the cafe on the aft side will be the main saloon, 74 by 64 ft., lighted from

Canadian Pacific Ry. Trans-Pacific s.s. Empress of Asia.

being extended to the stern on side stanchions. Above the bridge deck will be a promenade deck about 350 ft. long on which will be the principal first class public rooms, with the officers' quarters and navimasts and three funnels, straight stem, and as before mentioned, cruiser stern. In order to secure the safety of the vessels in the unlikely event of collision or grounding, the hulls are to be sub-divided by numerous watertight bulkheads, closely spaced in accordance with the recommendations of the bulkheads committee, in such a manner that even should any two adjacent compartments be simultaneously laid open to the sea, the weather deck would still be about 18 ft. above water. In addition, the usual complement of lifeboats and lifebelts will be carried, and there will be an installation of wireless telegraphy. The vessels are being constructed under the supervision of Lloyd's Register Society and will be classed by them 100 A1, three deck and shelter deck, with freeboard restricted to conform to the bulkhead spacing.

the sides from a number of beautifully designed windows nearly 5 ft. wide, and from above by a large well, 26 by 16 ft. The tables will be arranged to suit the demands of various passengers, from small ones for two and four persons to semiprivate tables for six arranged in alcoves, and larger tables for larger parties. In the central part of this deck will be the main kitchen, the pantries, cold larders, bakery, etc., equipped with all the latest hygienic and labor saving devices necessary for effectively serving the first and second class passengers. To minimize the running to and fro a number of electric lifts will be erected between the main kitchens and the various stores, and the number of 'b deck' pantries will be installed on the bridge and promenade decks above. Abaft the galley and adjoining the turbine hatch, within easy reach of the promenade on the shelter deck will be the engineers' quarters, so arranged as to give the maximum comfort to the engine room staff in hot weather. Within easy reach of their cabins on the upper deck, and leading

direct to a covered promenade on the shelter deck, will be second class entrance and lounge, which in turn will lead to the second class saloon. These rooms will be fitted in a large, airy deckhouse about 50 by 48 ft. and 9 ft. high, lighted on three sides by large plate glass windows. At the aft end of the shelter deck, isolated from the first and second class, a large covered airing space for Asiatic steerage will be provided. The hospitals, laundry, embalming room, etc., will be at the extreme aft end of the ship on the shelter deck.

Ascending the grand staircase from the reception room the first class staterooms on the bridge deck will be reached. These rooms will be enclosed in a complete steel deckhouse 340 ft. long. Each of these rooms will be 10 by 9 ft., with sleeping berths for two persons, and a couch so arranged as to be easily converted to a bed should it be found necessary. The sleeping berths again are so designed that should one passenger only engage the room, all evidence of the other berth will be hidden, leaving only a single brass bedstead. Another feature will be that two staterooms can be converted into one suite, with dressing room (with hot and cold water) adjoining. Surrounding the deckhouse will be one of the first class promenades, on either side of the house on the straight this promenade will be 430 ft. long, with a maximum width of 8 ft. At the aft end for 100 ft. it will extend from side to side of the ship. Encircling the promenade at the forward end of the deckhouse a screen will be erected at the ship's side and across the ship 8 ft. in front of the house, with large observation windows, which will give a sheltered promenade 240 ft. long. Forward of the screen the bridge deck will continue to the forecastle deck, and will be fitted with powerful cable holders and capstans for quick and efficient handling of the vessel. At the bead of the grand staircase will be the promenade deck, with a deckhouse 320 by 44 ft., in which will be first class staterooms for one and two persons, parlor suites of two, three and four rooms, all self contained with bathroom, dressing room and lavatory accommodation. At suitable intervals in the deckhouse other stairways will be fitted, giving easy access to the first class on the bridge deck below and the saloon on the shelter deck. Midway in the length of the deckhouse will be the lounge, 48 by 38 ft and 14 ft. high at the centre. Further aft a writing room will be introduced and at the aft end a smoking room and verandah cafe 57 by 40 ft., and 14 ft. high. Around the deckhouse will be an open promenade with screen protection at the forward end, similar to that fitted on the bridge deck. On the house top, with an internal stairway from the deckhouse on the promenade deck, a large gymnasium, 16 by 28 ft., will be fitted up with exercising machines. The officers' accommodation and navigating bridge, forward on the house tops, have received special consideration, in view of the length of the voyage and the variety of climates the ship will pass through. All the latest devices for the quick handling and control of the vessel will be installed. A dining room, served by an electric lift from the ship's main pantry, and a cosy smokeroom will be among the arrangements provided to conduce to the officers' comfort. The outstanding features of these vessels will be the size, design and quality of the public rooms, parlor suites, special and ordinary staterooms, also the large proportion of the second class and Asiatic accommodation. The public rooms in the one ship will be of English design and in the other of French. Among other special features worth mentioning are the various methods of heating and ventilating the ships. Each first class room or public room can be heated and ventilated on the thermo tank principle, and also the second and the steerage accommodation, about 20 of these tanks being distributed throughout the length of the vessels. Natural ventilation will also be provided in various sections. Electric radiators and electric fans can be used in the state or public rooms should conditions so demand.

The sanitary accommodation will be of the most improved description, each group of lavatories being fitted with an ample number of baths, showers, washbasins, etc., supplied with hot and cold sea and fresh water passing through specially designed filters. A powerful electric suction fan in each section will keep the lavatories fresh. The electric generating plant will consist of five independent sets of engines and dynamos, provides a complete system of electric lights, radiators, and power for the large stokehold fans, also for the ventilating fans throughout the ship, and the silent working cranes and winches for rapid handling of cargo. Signalling at sea can be carried on by a semaphore on the bridge, of the type used in the British Admiralty for short distances. A Morse lamp for night signalling and the long range Marconi system will be installed.

The propelling machinery will consist, as above stated, of four turbines, embodying the most recent improvements in design and construction to ensure the maximum economy of fuel consumption on service attained. The port wing shaft will be driven by a h.p. turbine which will exhaust into a l.p. turbine driving the starboard wing shaft. The two inner shafts will each be driven by a l.p. turbine, which will have a powerful astern turbine incorporated in the same casing. The introduction of a l.p. turbine to the installation will provide a much wider range for the expansion of the steam, and will effect a marked improvement in steam consumption as compared with the usual arrangement of turbines, driving either three or four shafts, hitherto adopted in large mail steamships and naval vessels. Hitherto these have been fitted with either one h.p. turbine, exhausting to two l.p. turbines, or two h.p. turbines, exhausting to two l.p. turbines. For manoeuvring when entering or leaving harbors, independent high pressure steam connections will be provided on each l.p. ahead turbine. An independent high pressure steam connection will be provided on the l.p. turbine, which, combined with a suitable arrangement of valves, will enable the h.p. turbine to be cut out, or should the l.p. turbine be out of action, the h.p. turbine will be able to exhaust direct into one or other or both of the l.p. turbines.

The four turbines will be situated in one watertight compartment, and in a separate compartment immediately aft, two condensers will be placed, together with the circulating pumps, dual type wet and dry air pumps, evaporators and distillers. The circulating and air pumps will form two distinct and separate sets, each set working in conjunction with one condenser, and independent of the other, but they will also be arranged with suitable cross connections, so that either set of pumps may, in case of emergency, work in conjunction with both condensers. The installation of auxiliary machinery will be exceptionally large, and, as in the case of the turbine installation, has been designed with a view to securing the greatest economy in fuel consumption and convenience in working. The feed water system for the boilers will comprise two twin filters of the gravitation type, through which the water from the air pumps will be discharged on its way to the hotwell tanks; and two hotwell pumps, which will discharge the feed water, first through a surface feed water heater, and afterwards through a contact feeder from which the four feed pumps will take their supply and discharge direct to the boilers. The feed water will be heated by the exhaust steam from the auxiliary machinery throughout the ship, the steam from the ship's heating systems and drainage systems from steam pipes, etc. The system evolved is the result of careful consideration, and will ensure that all waste heat from the auxiliary steam and exhaust systems will be utilized in heating the feed water instead of the heat being carried away by the circulating water from the condensers.

For harbor use, a separate auxiliary condenser with circulating pump, air pump, feed filter and feed pump will be fitted, to admit of the corresponding auxiliary machinery used on service being opened out for cleaning and examination as necessary. All the bearings for the turbine and line shafting will be connected to the forced lubrication system, and the oil supply will be maintained by four large oil pumps which will discharge the oil through special coolers before entering the bearings. Separate pumps will be fitted for circulating cold sea water through the oil coolers. Drain tanks, into which the oil will gravitate from the bearings and settling tanks, for separating any water or impurities from the oil, will be fitted in the condensing room. The pumps for ship's service will consist of two general service pumps, three sanitary hot and cold water pumps, two bilge pumps, two fresh water pumps and a ballast pump.

The refrigerating machinery and electric machinery will be situated in a separate compartment aft of the condenser room. In view of the service in which these vessels are to be engaged, the installation of refrigerating machinery will be very large, and will comprise two machines of the CO_2 type. The electrical generating machinery will consist of four independent units, each of which will comprise a compound wound dynamo, driven by an enclosed forced lubrication compound engine.

Steam will be generated in six large double ended boilers and four single ended boilers, situated in three separate compartments and working under forced draught, the air supply being maintained by an installation on the main deck. Two pole masts and three large and well proportioned elliptical funnels, one for each boiler compartment, will give the vessels a strikingly handsome appearance. For dealing with the ashes at sea, ash ejectors will be fitted in each stokehold, and in each boiler compartment a specially designed ash ejector pump for supplying the water under pressure to the ejectors will be fitted. Steam ash hoists of a silent type will also be fitted in each boiler compartment for harbor service. The ash hoisting arrangements have received special consideration, in order to minimize the noise which is so objectionable, and this machinery will therefore be removed entirely from the vicinity of the passenger quarters.

The report of the British Government commission, headed by Lord Mersey, which investigated the loss of the s.s. Titanic has been published in pamphlet form under the title "Shipping Casualties (Loss of the s.s. Titanic)." It may be purchased from Wyman & Sons, Ltd., Fetter lane, London. E.C., price 7½d.

Work was commenced early in September on the construction of the wharf at Port Moody. It is expected that it will be completed during October, when there will be no difficulty in bringing ocean going vessels right alongside. There is a depth of 60 ft. in the harbor. The contract price is $8,500.

The Floating Dry Dock for Montreal.

The dry dock, of which some particulars have already been given in Canadian Railway Marine World, which is to be established at Montreal as a part of Canadian Vickers Ltd., dry dock and shipbuilding plant, left Barrow-in-Furness, Eng., for Montreal, Aug. 29, in tow of two powerful steam tugs, specially engaged from a firm in Holland, who make a specialty of this

Floating Ship Dry Dock, Duke of Connaught, for Montreal.

class of work. One of the tugs is equipped with a wireless telegraph installation, so that immediately the tow enters the area of communication, reports of the progress will be kept up. The arrival on this side was expected about the end of September, or early in October, the longer, or extreme southern route being taken, so that in case of accident, the Azores might be made.

The dock is of the double sided, self docking type, on the bolted sectional principle, consisting of a pontoon or lifting portion, and parallel side walls, built on and forming a part of same, and the whole divided into three complete, separate sections, which when bolted together form the complete dock. These sections are so arranged that when the dock is separated into three parts, any two of them can dock the remaining third between them, and for this purpose, each section is fitted with independent pumping machinery, so that it can act as an independent unit. The construction has been so carried out that it is suitable for lifting a modern British battleship, the pontoon deck having been specially stiffened for the support of a large portion of the weight of the vessel on the side, or bilge, as well as the central keels.

The pontoon consists of a rectangular structure, plated all round except the portion of the deck directly under the walls, and stiffened internally by longitudinal and transverse girders. It is divided into three sections, the two end sections having their outer extremities built in the form of a point or bow, ending in a working platform arranged on plate and braced girders. The bottom plating, except under the walls, runs transversely, and is connected with the plating of the sides and points by chine angles, and the top or deck plating, which is arranged in the same manner, is similarly connected with the face of the side wall. The pontoon is divided into four compartments, by three longitudinal intercostal water tight plate bulkheads, and transversely it is divided into 54 bays, of which 17 are in each end section, by transverse girders, consisting of plate bulkheads. Special lattice girders are used in the compartments under the walls, instead of plate girders. In addition to the bulkheads, the deck and bottom platings are stiffened by a series of longitudinal frames running fore and aft over the length of the pontoon, intercostal between the transverse girders. Under the wall, in addition to the transverse lattice girder, intermediate transverse ordinary frames are placed 2½ ft. apart, and prolonged upward, forming the ordinary frames of the walls. The centre bulkhead between the transverse girders, is stiffened by vertical breathing plates, also stiffened and connected to a longitudinal curtain plate. Outside this last mentioned framing, the pontoon deck and bottom are stiffened by longitudinal framings of angles connected to the transverse bulkhead stiffeners by gussets and diagonals. These extend to the face of the wall, and in the centre section several of these frames are provided with plates riveted to them to take the load from the side keel blocks. The intermediate longitudinal bulkheads are formed of vertical plates, intercostal between the girders to which they are attached, as they are also to the top and bottom plating. In order to facilitate the complete withdrawal of all water in the pontoon, shallow troughs, forming a gutter, are fitted. The walls of the dock are plated horizontally and have a batter on the inside wall. The top deck of the walls is plated longitudinally, and is connected to the side plating by double chine angles. All the machinery of the dock is placed on an engine deck about 16 ft. below the top deck, and made water tight. Each wall is divided, in addition to the joint chambers, into 10 water tight divisions by plate bulkheads, in line with the bulkheads of the pontoon, of which they are a continuation. A docking land is formed at each end of the wall, on which the central portion can rest when being self-docked. The framing of the walls is both braced and ordinary. The frames consist of single angles stiffened by vertical web plates, the front and cross frames being cross connected by diagonals and gussets. The ordinary frames of the walls consist of single angles back and front, cross connected by horizontal struts. About a foot below the top deck a running deck is arranged from one end of the dock to the other, outside the stanchions, to enable the ropes to be handled easily, and timber heads and other fittings required for berthing vessels are placed on this deck. Two other platforms, known as the painting and shoring platforms, are placed 15 and 29 ft. respectively, below the running deck.

Each end of the centre section and each square end of the terminal sections is provided with a joint chamber, so that the sections can be joined, or parted. For dealing with trading vessels, not of large weight or dimensions, the dock has been designed so that it can be worked in two independent units of unequal size, and to enable a rapid connection of the two portions to be made, cast steel rocking joints, in the form of knuckles, are fitted to the level of the keel blocks. The pumps are driven by steam supplied by boilers carried on the dock, each installation consisting of two boilers, two engines and pumps placed in specially built chambers on one of the walls. The pumps are of the centrifugal type, 17 ins. diar., and are seated on the main drain at the bottom of the dock, from which compartment pipes are led to each separate water tight division. Each compartment is governed by its own separate valve, and the main inlet pipe and pump discharge pipe are governed by separate screw-down valves and a non-return flap valve on the outside. The compartment valves of each section of the dock are operated from a valve house located on the top deck of each section, by the Westinghouse electro-pneumatic system, based on the principle of operating presses by com-

Floating Ship Dry Dock for Montreal; Interior.

pressed air, and controlling same from a distance by valves operated by electro-magnet. Each valve house is connected by telephone with its engine room and with the others when the dock is working as a single unit. Each section is also provided with a direct acting steam pump arranged to draw from the sea, capable of providing a full stream of water for fire service or washing down vessels. These are also connected to the main drain so that they may be used as a drainage service for completely emptying the compartments. Two similar steam pumps are also fitted on the opposite wall of the dock.

Steam heating is provided to prevent freezing of water in the compartments, and each water tight compartment is equipped with an indicating system to show, in the valve house, the level of water in the compartment, and a similar arrangement is supplied to show the draught of water over the keel blocks. Four steam capstans are provided on each of the two walls, the spindles being carried down vertically to the level of the pontoon deck, where, in a small chamber in the wall, cable lifters are fitted, so that the mooring cables may be hauled in or paid out when the dock is being moved. Donkey boilers are fitted on the opposite wall to that on which the main boilers are fitted, to provide steam for the capstans and fire pumps on that wall. On the top deck of this wall a three ton electric travelling gantry crane is placed, arranged to traverse the whole length of the wall, and at both ends of the combined dock two flying gangways or swinging bridges are placed, giving access to each wall. The dock is lighted throughout by electricity, the outside lighting being by bracket standards with a cluster of lamps, the box terminals are fitted on the walls, from which lamp clusters can be taken by flexible leads for lighting any particular point. The current is to be supplied by cables from the shore.

The dock is supplied with the usual bollards and timber heads, and roller fenders are also fitted to protect the walls from an entering vessel. Eight mechanical side shores, four on each wall, are provided, which can be screwed in or out by a standard fitted on the top deck. The keel blocks are strongly made and closely spaced to take the weight of the heaviest vessels, and ladders are fitted leading from the upper deck of the dock to the pontoon deck, and to the various compartments.

Following are the general dimensions of the dock:—

Length over platforms	600 ft.
Length over pontoons	550¼ ft.
Width over all	135 ft.
Depth of pontoon at centre	17 ft.
Length of side walls	470½ ft.
Height of side walls above pontoon deck	42 ft.
Width of side wall at base	17¼ ft.
Width of side wall at top	12½ ft.
Clear width between roller fenders	100 ft.
Draught of vessel	27½ ft.
Lifting capacity	25,000 tons.

The accompanying illustrations show the interior of the dock, and the completed dock as viewed from the water.

This dock is the fourth largest in the world, the largest with a lifting capacity of 40,000 tons, and the second largest, of 35,000 tons, being owned in Germany, while Great Britain owns the next largest, the twin docks of 32,000 tons lifting capacity each.

Gaspe Bay Developments.

An important development is taking place in Gaspe bay, Que. With a view to provide for ocean steamship traffic, work is proceeding on the construction of a breakwater at Sandy beach, on the south coast, the contract for which was given to Horace Dussault, of Quebec, in April, 1910, for $273,985. The structure consists of two parallel cribs, 15 ft. wide at top, 18 ins. above low water mark, with a 12 ft. trestle on top of the cribs. The breakwater will be 1,000 ft. long and 95 ft. wide at top, starting at the 15 ft. line and running to the 50 ft. line of water at low water. J. T. Bertrand, District Engineer, Public Works Department, is in charge, and progress estimates have been received for $157,360, of which $144,310 has been paid. As far as can be ascertained, no arrangements have been made for any line of vessels to use the Gaspe route. A spur track has been built from the Atlantic, Quebec & Western Ry. to the Sandy bay breakwater.

Arrangements are being made by which some of the steamships operated by Henri Menier, proprietor of Anticosti island, will run between that place and Gaspe, carrying fish for shipment from Gaspe by rail. M. Menier will probably have a wharf of his own, either at or near Gaspe Basin.

Instructions for Vessels When Approaching Canadian Ports.

The Government having taken into consideration the fact that local, or other circumstances may arise in which it may be necessary, on account of periodical exercises, manœuvres, or otherwise, to forbid all entrance to certain ports of the Dominion, notice is given that on approaching Canadian shores, or any of the following ports, viz.:—Halifax, N.S.; Quebec, Que.; Esquimalt, B.C.; a sharp look out should be kept for the signals being displayed, and the distinguishing and other signals made by them. If entrance to a port is prohibited, three red vertical lights by night, or three red vertical balls by day, will be exhibited in some conspicuous position, in, or near to its approach, which signals will also be shown by the vessels appointed for examination purposes. If these signals are displayed, vessels must either proceed to the position marked "examination anchorage" on the Admiralty charts, and anchor there, or keep the sea. At the ports beforementioned, searchlights are occasionally exhibited for exercise, and instructions have been given to avoid directing movable searchlights during practice on vessels under way, but mariners are warned that great care should be taken to keep a sharp look out for the signals indicated, when searchlights are observed to be working.

Under certain circumstances it may become necessary to take special measures to examine vessels desiring to enter the ports or localities referred to, and in such case, vessels carrying the distinguishing flags, or lights, already mentioned, will be charged with the duty of examining vessels which desire to enter the ports, and of allotting positions in which they shall anchor. As the institution of the examination service at any port will never be publicly advertised, special care should be taken in approaching the ports, by day or night, to keep a sharp look out for any vessel carrying the distinguishing flags or lights, already mentioned, and to be ready to bring to at once when hailed by her, or warned by the firing of a gun or sound rocket. By day, the distinguishing flags of the examination steamer will be a special flag, white and red horizontal surrounded by a blue border, and the blue ensign; also three red vertical balls if the port is closed; three white vertical balls if the port is open. The lights mentioned will be carried in addition to the ordinary navigation lights, and will show an unbroken light round the horizon.

Masters are warned that before attempting to enter any of these ports where the examination service is in force, they must in their own interests, strictly obey all instructions as to entry given to them by the examination steamer, and in the absence of any instructions from the examination steamer, they must proceed to the position marked "examination anchorage" on the Admiralty charts and anchor there, or keep the sea. In case of fog, masters of vessels are enjoined to use the utmost care, and the examination anchorage itself should be approached with caution. The pilots attached to the ports will be acquainted with the regulations to be followed.

Any vessel approaching a defended port in the Dominion, when searchlights are being worked, and finding that they interfere with safe navigation, may make use of the following signals, either singly, or combined,—by flashing lamp, four short flashes followed by one long flash, or by whistle, siren or fog horn, four short blasts followed by one long blast. Whenever possible both lamp and sound signals should be used. On these signals being made the searchlights will be worked so as to cause the least inconvenience, either being put out, raised, or their direction altered. The signals should not be used without real necessity, as unless the vessel is actually in the rays of the searchlight, it is impossible to know which searchlight is affected.

The Canadian Interlake Line's Vessel Fordonian.

The vessel Fordonian, which has been built at Glasgow, Scotland, for the Canadian Interlake Line Ltd., for operation by the Merchants Mutual Line in the lake trade, is on its way to Toronto, having left Glasgow, during September. She is of the ordinary type of lake and canal vessel, but is equipped with a Carels-Diesel engine of the four cylinder, two cycle type, of 800 b.h.p., developing 200 b.h.p. per cylinder. In vessels of this type, the machinery space is considerably reduced, being only about one third of that of steam driven vessels, and economy of fuel is also an important consideration.

The Fordonian is the first vessel of this particular type to be built at Glasgow, and it is stated that she will have a radius of navigation, on the same bunker capacity as a steam driven vessel, of at least four times that of the latter, in addition to the time saved by being able to make an immediate start, and having no standby charges.

The whole of the machinery was built at Glasgow, with the exception of the cylinders, and the engine is built up of the highest powered units yet seen in a British marine heavy oil engine.

Her dimensions are:—length, 250 ft.; breadth, 42 ft. 8 ins.; depth, moulded, 16 ft. 10 ins. to main deck and 26½ ft. to awning deck.

The U. S. Lake Survey reports the levels of the Great Lakes in feet above tidewater, for August, as follows: Superior, 609.49; Michigan and Huron, 508.58; Erie, 572.45; Ontario, 246.66. Compared with the average August levels for the past ten years, Superior was 9.25 ft. below; Michigan and Huron, 9.45 ft. below; Erie, 0.24 ft. below; Ontario, 9.94 ft. above. It was anticipated that during September, Superior would rise 0.1 ft.; Michigan and Huron, 0.2 ft.; Erie, 0.3 ft., and Ontario, 0.4 ft.

The East Side Fish Co.'s steam tug, which is being built at Collingwood, was launched there, Sept. 17. She is 77 ft. long, and equipped with fore and aft compound engines with cylinders 9 and 18 ins., diar., by 14 ins. stroke. She will be operated out of Port Stanley in the fishing trade on Lake Erie.

Statistics of Canadian Shipping.

The total number of vessels on the Canadian register for the year ended Dec. 31, 1911, was 8,088, measuring 70,446 tons, being an increase of 184 vessels and 19,517 tons over 1910. There were 3,444 steamers, with a gross tonnage of 588,741, included in the list, which, at an assumed average value of $30 a ton for the net registered tonnage, represents $23,113,380. The number of new vessels built and registered in Canada was 339, representing 27,736 tons net register, which, estimated at $45 a ton, gives $1,148,120 for new vessels. During the year 279 vessels were removed from the register, lists of which, together with details of new registrations, were given in Canadian Railway and Marine World, throughout the year. It is estimated that 41,447 men and boys, inclusive of the masters of the vessels, were employed on Canadian registered vessels during 1911. The number and tonnage of vessels, according to provinces, are as follows:

	Sailing ships and steamships	Steamships	Gross tonnage of steamships	Net tonnage of sailing ships and steamships
Ontario	2,014	1,472	255,628	236,877
Quebec	1,511	490	128,523	193,682
Nova Scotia	2,105	296	35,916	142,631
British Columbia	1,227	873	112,511	122,264
New Brunswick	966	200	39,890	55,872
P. E. Island	149	20	4,407	9,683
Manitoba	96	86	8,348	6,373
Yukon district	15	3	3,132	2,708
Saskatchewan	5	4	381	356
Totals	8,088	3,444	58,8741	770,44

In a list showing the net registered tonnage of the shipping of the various maritime nations of the world, Canada appears as the ninth.

Of the vessels which were removed from the Canadian register during 1911, 21 were sold to foreigners, 37 were wrecked 15 stranded, 12 lost, 78 broken up, 10 abandoned at sea, 3 sunk in collision, 12 foundered, 31 were burnt, 2 condemned, 31 reported out of existence, 2 dismantled, 17 were transferred to Newfoundland, and 8 to Barbadoes.

Ports of registry are distributed as follows:—Ontario, 38; Nova Scotia, 21; New Brunswick, 7; Quebec, 6; British Columbia, 4; Prince Edward Island, Manitoba, Saskatchewan and Yukon territory, one each.

The ports having a net tonnage of 10,000 and over, are as follows:—

	Vessels. Sailing.	Steam.	Net tonnage.
Montreal	803	297	141,274
Victoria, B.C.	325	203	65,350
Toronto	352	285	57,513
Vancouver, B.C.	686	531	45,573
Quebec, Que.	618	158	45,097
St. John, N.B.	330	105	39,953
Ottawa	390	253	31,014
Windsor, N.S.	72	15	24,161
Lunenburg, N.S.	332	30	22,743
Kingston, Ont.	208	139	22,092
Halifax, N.S.	433	100	21,765
Midland, Ont.	30	24	16,214
Parrsboro, N.S.	87	7	15,659
Hamilton, Ont.	40	37	14,930
Collingwood, Ont.	78	73	14,659
Yarmouth, N.S.	310	38	13,624
Port Arthur, Ont.	80	55	11,159
S. S. Marie, Ont.	69	59	10,318

The vessels built and added to the register during 1911, according to provinces, were as follows:—

	Vessels.	Tonnage.
Ontario	42	10,086
British Columbia	98	7,781
Nova Scotia	136	5,340
Quebec	30	2,726
Manitoba	3	902
New Brunswick	25	774
Saskatchewan	1	66
Prince Edward Island	4	61
Totals	339	27,736
Totals, 1910	294	22,283

Canadian Notices to Mariners.

The Department of Marine has issued the following:—

65. Aug. 23. 180. Ontario, Detroit river, off southern end of Fighting island, spar buoy replaced by gas buoy. 181. Ontario, Lake Superior, east end, Whitefish bay, Ile Parisienne, light and fog alarm established. 182. Ontario, Lake Superior, Thunder bay, Port Arthur, Bare point, breakwater under construction, lights.

66. Aug. 24. 183. New Brunswick, Bay of Fundy, Grand Manan island, Ross island, Grand harbor, Fish Fluke point, character of light. 184. Nova Scotia, Avon river, Windsor bridges, arrangement of lights changed, new bridge being built. 185. Nova Scotia, south coast, Cross island, change in character of light. 186. Quebec, River St. Lawrence, Portneuf-en-bas lighthouse, slats placed in skeleton frame. 187. Newfoundland, south coast, St. Lawrence harbors, Middle head, fog alarm established.

67. Aug. 24. 188. British Columbia, Chatham sound, entrance to Prince Rupert, Holland island, lighthouse under construction, temporary light.

68. Aug. 26. 189. Quebec, River St. Lawrence, Beauport bank, conical buoy replaced by gas buoy. 190. Quebec, River St. Lawrence, Montreal harbor, Ile Ronde range, Ile Ste. Helene, lighthouse established.

69. Aug. 27. 191. Ontario, Lake Superior, eastern end, outer Pancake shoal, bell buoy replaced by gas and bell buoy. 192. United States of America, Lake Erie, Buffalo harbor approach, lightship established.

70. Aug. 27. 193. British Columbia, Thompson river, Kamloops lake to Little Shuswap lake, buoys and day beacons established.

71. Aug. 29. 194. British Columbia, Vancouver island, west coast, Clayoquot sound, Templar channel, telephone connection between Lennard island light-station and Tofino. 195. British Columbia, Vancouver island, east coast, Cordova bay, uncharted rock. 196. British Columbia, Strait of Georgia, Porlier pass, arc of visibility of front range light on Race point increased. 197. British Columbia, Chatham sound, Dundas islands, Hudson Bay pass, uncharted rock. 198. United States of America, Washington, Juan de Fuca strait, Neah bay, whistling buoy replaced by gas and whistling buoy, light discontinued.

72. Aug. 31. 199. Quebec, River St. Lawrence, St. Thomas channel, dredging, rearrangement of buoys, gas buoys established.

73. Sept. 5. 200. New Brunswick, south coast, Bay of Fundy, Musquash harbor, buoys established. 201. New Brunswick, south coast, Bay of Fundy, Cape Spencer, reported irregularity of light contradicted. 202. New Brunswick, east coast, Northumberland strait, Kouchibouguac bay, St. Louis gully, Kouchibouguacsis river, change in position of range lights. 203. New Brunswick, east coast, Kouchibouguac bay, Kouchibouguac river, change in position of range lights. 204. Prince Edward Island, south coast, Hillsborough bay, Charlottetown harbor, buoy re-established. 205. Newfoundland, Labrador, Belle isle, south end, position of main light, erratum in list of lights. 206. England, west coast, Trevose head light, alteration in character. 207. England, south coast, Lizard head, submarine fog signal established off.

74. Sept. 6. 208. British Columbia, Lama passage, Campbell island, Napier point, day beacon erected. 209. British Columbia, Queen Charlotte islands, entrance to Houston Stewart channel, beacon to be moved from Kova point to Danger rocks.

75. Sept. 7. 210. Quebec, Gulf of St. Lawrence, Magdalen islands, Grindstone island, Etang du Nord lightstation, new lighthouse, change in character of light.

76. Sept. 11. 211. British Columbia, Queen Charlotte islands, Skidegate inlet, hydrographic information.

77. Sept. 12. 212. Ontario, Lake Erie, Port Burwell, change in position of back range light of inner range. 213. Ontario, Lake Erie, shoal off entrance to Port Stanley, caution. 214. United States of America, St. Lawrence river, Ogdensburg harbor, Ogdensburg light, red sector to be installed.

78. Sept. 13. 215. Ontario-Michigan, Detroit river, Livingston channel, aids to navigation to be established.

The White Star Steamship Britannic.

The Atlantic liner, which is being built at Belfast, Ireland, for the White Star Line, and which will be named the Britannic, will in general features be similar to the Olympic, but of somewhat larger tonnage. There will also be various improvements introduced into the new vessel, resulting from the experience gained from the Olympic, and profiting by the lesson of the Titanic disaster. The Olympic will also be altered at an early date with a view to making her what her owners believe will be the safest ship in the world. The general structural changes will be very few, the strength of the Olympic under all weather conditions having proved entirely satisfactory. In two important respects, however, both vessels are to bear evidence of the recent change in expert and public opinion as regards protection against the effects of collision, both by the introduction of a complete inner skin extending to a considerable height above the load line throughout the most vulnerable portions of the vessels, and also by the increased height and number of watertight bulkheads, so as to render both ships as nearly unsinkable as possible.

The inner skin will consist of heavy plating, well stiffened, extending for more than half the length of the vessel, from the watertight bulkhead in front of the forward boiler room to the after end of the turbine engine room, the inner skin being strongly connected to the outer shell by longitudinal plates and angles and specially strong connections at bulkheads and watertight divisions. The space between the outer and inner shells will be the width of the web frames at present in the ship, and this reinforced structure will run from the tank top, i.e., from the top of the double bottom, to a point well above the load water line. In addition, an extra watertight bulkhead will be introduced, and several of the existing bulkheads carried up to the bridge deck.

The additional strength and safety afforded by these methods will be easily appreciated. Hitherto it was considered sufficient if a vessel could float with any two compartments pierced; but the olympic and Britannic, besides having this extra protection against serious damage, will, it is claimed, be able to float with any six compartments flooded; and with these special provisions it is not considered within the possibility of chance that so many compartments could be in this condition.

The Chief Engineer states, that every effort is being made to complete the excavation and the work on the locks of the Panama canal by June 30, 1913. He expects to see the level of Gatun Lake at 85 ft. some time in Sept., 1913. If this be accomplished and the first boat be successfully put through the canal, announcement will be made that it is in condition to pass shipping. This, he says, will allow of a year's try-out before the formal opening.

Allan Line Changes.

A number of changes in the directorate of the Allan Line have been announced recently, Sir H. Montagu Allan, one of tbe principal directors, and Bryce J. Allan, who has acted as Manager at Boston, Mass., for the past 25 years, have retired from active connection with the company. Sir Montagu Allan, is reported to have said, in connection with his retirement, that he had been impelled to take the step of leaving the management in the hands of Hugh, and Andrew A. Allan, because he wished to have more time to devote to other affairs.

Hugh Allan, who left Montreal a few years ago to take up his residence in London, Eng., it is reported, will continue to act as chairman of the company, and Andrew A. Allan will continue to represent the board in Canada. Andrew H. Allan, of Montreal, has been appointed Manager at Boston, Mass., succeeding Bryce J. Allan, and has left Montreal to take up his new duties. A number of minor changes are in contemplation.

Reports as to the amalgamation of the Allan Line with the C.P.R., are met by the statement of G. Hannah, Passenger Manager of the line at Montreal, that he personally believes that the so-called fusion is a newspaper story, and that no official notice of it has been received at the Montreal office, whicb would have been notified if it had taken place.

Atlantic and Pacific Ocean Marine.

The Allan Line steamships' first sailing from Halifax, for the winter season, is fixed for Dec. 7.

During August, 56 ocean going steamships arrived at Montreal, having a combined gross tonnage of 393,369 tons.

The C.P.R. s.s. Lake Champlain ran into a sandbank in the St. Lawrence river, off Dominion Park, Montreal, Sept. 3, and was released early the next morning without damage.

The New Zealand Shipping Co.'s s.s. Wakanui, which was scheduled to sail from Montreal, Sept. 15, was discovered to be on fire, Sept. 13. The damage to cargo is estimated at $25,000.

The Allan Line s.s. Mongolian, while outward bound from Liverpool, Eng., for Halifax, N.S., is reported to have run aground in the River Mersey, Aug. 31. The accident was due to the breaking of a tow rope, and no damage was done beyond the delaying of the sailing for a day.

The Canada Line, operating steamships between Canadian ports and Hamburg, Bremen and Rotterdam, which recently contemplated making additions to its service, has announced that such extensions are no longer to be considered, owing to standing agreements with the C.P.R. and other companies.

The Allan Line's steamships Alsatian and Calgarian, which are under construction at Glasgow, Scotland, are expected to be ready for service in May and August, 1913, respectively. The vessels are each of about 18,000 tons gross register, with engines of about 20,000 h.p., and will average about 20 knots an hour.

A press report from Victoria, B.C., states that the recently formed Pacific Canadian Steamship Co. intends to suspend its service between Victoria, Vancouver and Salina Cruz, for a time, owing to the disturbances in Mexico having interfered with trade, and to the fact that all space on Atlantic freighters has been secured for export of cotton for some time.

G. A. Gibbs, member of the British Parliament, who was visiting in British Columbia recently, stated that, on the opening of the Panama canal, he hopes to see the establishment of a direct steamship line between Vancouver and Bristol, Eng., and mentioned that Bristol is one of the great wheat importing ports of the old world, and with the new Avonmouth docks there, it is in a better position than previously to handle large imports.

D. W. Campbell, of Montreal, Manager, Elder Dempster Co., in Canada, was in Vancouver, recently, for the purpose of studying conditions there, especially in relation to the effects likely to be produced by the opening of the Panama canal. He is reported to have stated that, in his opinion, the opening of the canal will not result in any appreciable decrease of shipping rates, either by the Panama route or the Suez route, and also that he does not consider that any large volume of wheat will seek an outlet by the Pacific coast, mainly for the reason that on an average of eight out of ten years, vessels on the St. Lawrence route are glad to carry grain at ballast rates.

Maritime Provinces and Newfoundland.

The Reid Newfoundland Co. has chartered the U.S. steamship Mexican for its service between Lewisport and Bay of Islands.

During the summer, dredging has been proceeding through the Grandoon flats, in Miramichi bay, N.B., where a cut 200 ft. wide, with a general depth of 22 ft., has been made for 3.3 miles. The cut is being widened to 300 ft., and extended to a 20 ft. contour to make a total length of 3½ miles. The work will be completed before the winter sets in.

The Millerton Extract Co., Ltd., has been incorporated in New Brunswick, with $98,000 capital, and office at Millerton, among other things to own and operate vessels, wharves, dry docks, etc., and to carry freight and passengers. J. W. and T. C. Miller, E. P. Williston, Newcastle, N.B.; V. Burrill, Shawinigan, Que.; and Jas. McKechnie, Montreal, are the incorporators.

A motor lauch, one of five being built at Dartmouth, N.S., for the Marine Department, was launched there, Sept. 5. She will be equipped with engine of 40 n.h.p., developing a speed of about 12 knots an hour. Her dimensions are, length 45 ft., breadth 12 ft., draught 4½ ft., and there will be accommodation for a crew of 10. The second vessel is well on the way, and will shortly be launched.

The s.s. Sagona, which has been acquired for the mail service between Halifax, N.S., and St. Pierre, Miquelon, was built at Dundee, Scotland, early this year, sailing for the sealing grounds in the service of the Newfoundland Produce Co., Feb. 25. The agreement is with the French government, and covers 10 years. The ports of call are as before, with the addition of St. John's, Nfld. She has a net tonnage of 420, with cargo capacity of 920 tons deadweight, and accommodation for 46 first class and 36 third class passengers.

A press report from Ottawa states that tenders for the construction of a car ferry steamboat, for service across the Northumberland strait, between New Brunswick and Prince Edward Island, have been received from a number of British and U.S. firms, and it is possible that the contract will be awarded shortly. The same report states that on account of the currents and the force of wind, ice and water in the winter, the scheme has been declared by some to be impracticable. All points involved under these heads are dealt with in the report made to the Minister of Railways by Prof. Kirkpatrick, which is given fully on another page in this issue.

Province of Quebec Marine.

The Mackay-Hall Steamship Co.'s steamboat Eastwood collided witb tbe s.s. Rjnarock, near the mouth of tbe Saguenay river at Tadousac, Sept. 12, during a fog.

Tbe Sincennes-McNaugbton Line's steam tug Aurelie G., recently built at Glasgow, Scotland, sailed for Montreal, Sept. 15. During her trials she made an average speed of 11 knots an bour.

Tbe Montreal Harbor Commissioners have decided to increase the capacity of their elevator no. 1, by the fall of 1913, so that with the recent completion of the no. 2 elevator with a capacity of 2,640,000 bush., they will have a total capacity of 5,140,000 bush.

The Postmaster General, in response to a deputation from Quebec, in relation to proposed improvements to the port, stated that the Government was considering the immediate reorganization of the Harbor Commission, which will likely be reduced and placed on the same footing as that at Montreal. He considers it will be better to leave other matters in abeyance until the reorganization has taken place.

The Montreal Harbor Commissioners are reported to have decided to place orders shortly for 12 electric motors and a large quantity of rolling stock for tbe barbor railway system, which it is said is to be electrified. We have been officially advised that no orders for motors and rolling stock have been placed, and that the matter of electrification is not at present under consideration, though it may be taken up in the future.

During August, 3,664 permits were issued for vessels to pass through the Lachine canal, against 3,406 for August, 1911. Following is a classification of the traffic—wheat, 2,341,393 bush.; oats, 1,723,609 bush.; flour, 94,907 barrels; eggs, 2,166 cases; butter, 907 packages; cheese, 50,752 boxes; apples, 811 barrels. As compared with August, 1911, there were increases in the amounts of oats, cheese and apples, and decreases in the remainder.

Ontario and the Great Lakes.

The Norton Griffiths Dredging Co., Ltd., recently incorporated, has acquired the Daly and Hannan Dredging Co., of Prescott, Ont.

The Mackay-Hall Steamship Co.'s steamboat Robert R. Rhodes ran aground near Alexandria bay, Sept. 12.

Detailed plans for the proposed improvements at Hamilton harbor have been forwarded to the Public Works Department, and it is expected that tenders will shortly be asked for.

W. D. Ross, at one time mate and pilot on a passenger vessel running between Buffalo and Port Robinson, before there were any railways in the district, died at Welland, Sept. 13, aged 91.

It is reported that the C.P.R. will inaugurate a car ferry service between Grafton, Ont., and Charlotte, N.Y., in connection with its new lake shore line. Under present arrangements, C.P.R. traffic is forwarded to soutb shore ports by the Toronto, Hamilton and Buffalo route.

The recommended draughts for the Sault Ste. Marie canals have been increased by 2 ins., making the draught for the United States Poe lock, and the upward bound draught for the Canadian lock, 19 ft., and tbe downward bound draught 19 ft. 5 ins.

This is the first time for three years that the Poe lock has had a draught of 19 ft.

Construction on the breakwater off the entrance to Goderich harbor, south of the channel, is proceeding. Six cribs have been put in place, and reach to a height approximately equal to the water level, and the work of building the superstructure is following on closely. The northeast end of the breakwater is 1,140 ft. from the southwest end of the south pier at the entrance to the harbor.

The U. S. steamboat Britannic, owned by H. McMorran, Port Huron, Mich., ran ashore at Weavers point, near Morrisburg, Ont., recently, and was reported to have been abandoned as a total loss, after several attempts to refloat her. Later reports state that she had not been definitely abandoned, and that she is to be transferred to the Canadian register. She was built in 1888, her dimensions being, length 219 ft., breadth 36ft., depth 20 ft.; tonnage, 1,121 gross, 921 register.

The Merchants Mutual Line, Toronto, has secured writs of caveat from the Admiralty Court, and has paid a deposit of $1,000 a vessel, to exempt vessels operated by it, from possible seizure, thus insuring against loss of time. The vessels covered are: Acadian, Canadian, Renvoyle, A. E. McKinistry, owned by Canadian Interlake Line, Ltd.; A. E. Ames, Beaverton, H. M. Pellatt, J. H. Plummer, Mapleton and Saskatoon, owned by the Merchants Mutual Line, Ltd.; and D. A. Gordon, owned by the International Steamship Co.

At the annual meeting of the Lake Shippers Clearance Association, in Winnipeg, recently, the report showed profits on grain shipments, $2,404.24; commission as agents at Duluth, Minn., $1,027.03; switching and stores earned for shippers, $15,671.55; Government fees for registration, $2,499.26; bank interest, $1,493.68; total, $23,132.41.

The wreck of the steamboat Joliet, which has been a menace to navigation in the St. Clair river, near Sarnia, for some time, has been broken up and removed, and there is now a clear depth over the site of the wreck, of 25 ft., ascertained by sweeping. The vicinity was swept for a depth of 30 ft., and only a small obstruction was found with less than 30 ft. of water over it. This is being removed without further notice.

The contractors have completed the deepening of the western half of the Ballard reef channel in the Detroit river, and are commencing work on the eastern half. In consequence, all the gas buoys marking the latter channel have been moved 300 ft. to the westward. The western side of the channel, for temporary use by vessels of light draught, on the eastern side of, and adjoining Ballard reef main channel, has been marked by five black spar buoys, carrying lanterns, and located opposite the red spar buoys on the eastern side of the channel. Lanterns have been placed on the red spar buoys on the eastern side of the channel for light draught vessels.

The Keystone Transportation Co.'s steamboat Keybell was launched at Collingwood, Sept. 18. She is of full canal size, her dimensions being:—length, 258 ft.; beam, 42½ ft.; depth, moulded, 20 ft., with a carrying capacity of 3,300 tons, or about 110,000 bush. of wheat. She is built of steel throughout, and will be equipped with triple expansion engines with cylinders 16, 26 and 44 ins. diar, by 36 ins. stroke, supplied with steam by two Scotch boilers, each 11½ by 10½ ft., under a pressure of 180 lbs. per sq. in. She is of the single deck type, on the arch and web frame system, with holds unobstructed by pillars, and the grain cargo will be handled by the clam-shell bucket system. A full equipment of derricks and gear for the speedy handling of cargo, electric lighting plant and the usual auxiliaries, will be installed. She will be utilized for the great lakes trade, and on the Atlantic coast, for which she was designed by John Reid and Co., of Montreal, L. McMillan of that company acting as superintendent of construction.

The Peoples Line steamboat Frontier, which is at Polson Iron Works, Toronto, for overhauling, was recently reported to be waterlogged at Port Dalhousie, where she had been sent for repairs. Her condition, however, is stated to have been exaggerated. She was originally known as Empress of India, and was built at Mill Point, Ont., in 1876, for the Lake Ontario Navigation Co., Picton, Ont., which company is not now in existence, the route covered by its vessel now being operated by the Lake Ontario and Bay of Quinte Steamboat Co., Kingston, Ont. The dimensions of the Empress of India, were:—length, 170 ft.; breadth, 26 ft.; depth, 8.5 ft.; tonnage, 579 gross, 336 register, and she was driven by paddle wheels. She was rebuilt at Picton, Ont., in 1899, and renamed Argyle, being then owned by the Argyle Steamship Co., Toronto, her dimensions being:—length, 185.1 ft.; breadth, 26 ft.; depth, 9.7 ft.; tonnage, 700 gross, 374 register. She has been operated on various routes, during 1910 and 1911, between Toronto and Olcott Beach, N.Y., and during this year, when her name was changed to Frontier, from Toronto to Lewiston, N.Y., on the Niagara route. W. Evans, Steamboat Inspector, Toronto, is reported to have said recently that the vessel was absolutely seaworthy and in good condition when under his inspection in June, and he had received no communication from either the captain or engineer, whose duty it was to report if anything was wrong. He considered that the vessel had been improperly handled and had been allowed to run down for want of proper care and proper repairs, due to her having passed through so many hands, and not all men with practical steamboat knowledge.

British Columbia and Pacific Coast Marine

During August, 74 vessels arrived at and departed from Prince Rupert, in connection with the coastwise trade.

H. M. Davy, engineer, Dominion Public Works Department, is in charge of surveys and borings which are being made in Vancouver harbor.

The C.P.R. vessel which is under construction at Esquimalt, for the British Columbia coast service, is to be named Princess Maquinna.

The Marine Transportation Co. has commenced a service between Vancouver and California ports in the freight trade, with its s.s. Rupert City.

The Vancouver Terminals Co. is stated to have submitted to the Vancouver city council, a plan for the construction of about 12 miles of dock accommodation at Point Grey.

The British Columbia Transport Co., Ltd., with head office in London, Eng., and with a capital of £50,000, has been licensed to carry on business in British Columbia, with office in New Westminster, and E. J. Fader as its attorney.

The last steamboat scheduled to make connections at Gibbon for St. Michael, this year, will leave Dawson, Sept. 15, and the last vessel of the season to leave Dawson is booked to sail on Sept. 26, thus closing navigation on the Yukon river for the year.

It is reported that the White Pass and Yukon Route proposes to extend its steamboat service down the Yukon river to Fairbanks, Alaska, about 600 miles, and to establish a chain of hotels along the river. The report that the company was about to sell its railway to the G.T. Pacific Ry. has been officially denied.

Telephone communication has been established by the Dominion government for the protection of shipping, between the light station on Lennard island and the government telegraph office at Tofino. There is a land line from the light station to a cove on the northeast of Lennard island, a cable from the latter point to a cove on the west side of Low peninsula, and a land line from Low peninsula to Tofino.

The Dominion Public Works Department received tenders, Sept. 5, for the construction of a breakwater at Ogden point, Victoria. It will extend from Ogden point for 2,580 ft., running southerly for 330 ft., and thence westerly for 1,500 ft., curving northwesterly for 750 ft. On the completion of this work, the construction of five concrete piers will be taken up, together with the necessary warehouses and freight handling facilities, for the general betterment of the harbor.

The Coquitlam Terminal Co. is reported to be carrying out a survey of the channel in the Coquitlam harbor with a view to possible developments. The proposed chan-

Sault Ste. Marie Canals Traffic.

The following commerce passed through the Sault Ste. Marie Canals during July, 1912:

Articles			Canadian Canal	U. S. Canal	Total
Copper	Eastbound	Short tons	50	13,784	13,834
Grain	"	Bushels	2,254,384	666,255	2,920,639
Building stone	"	Short tons			
Flour	"	Barrels	365,080	691,805	1,056,885
Iron ore	"	Short tons	5,014,081	2,490,078	7,504,159
Pig Iron	"	"		6,260	6,260
Lumber	"	M. ft. b.m.	3,350	100,079	103,429
Silver ore	"	Short tons			
Wheat	"	Bushels	3,661,395	1,850,093	5,511,488
General merchandise	"	Short tons	6,826	21,578	28,404
Passengers	"	Number	4,520	5,789	10,309
Coal, hard	Westbound	Short tons	107,116	314,585	421,701
Coal, soft	"	"	405,201	1,676,664	2,081,865
Flour	"	Barrels			
Grain	"	Bushels		100	100
Manufactured iron	"	Short tons	42,252	33,803	76,055
Iron ore	"	"			
Salt	"	Barrels	6,713	36,743	43,456
General merchandise	"	Short tons	101,455	115,706	217,161
Passengers	"	Number	5,693	4,777	10,470
Summary.					
Vessel passages	"	Number	1,136	2,174	3,310
Registered tonnage	"	Net	3,765,427	4,499,563	8,264,990
Freight—Eastbound		Short tons	5,214,167	2,835,431	8,049,598
" —Westbound		"	656,983	2,146,271	2,803,254
Total freight		"	5,871,150	4,981,702	10,852,852

nel will extend from the Fraser mills to the Pitt river bridge, and the harbor, as at present planned, will extend from St. Marys hill to the Pitt river bridge. It is intended to have a channel 1,000 ft. wide. The survey will, it is estimated, cost $10,000. Soundings show an average depth of water of 30 ft. from the Fraser mills to the bridge, at which latter point, the depth is increased to 55 ft. It is stated that the results of the survey will be turned over to the Government to form the basis of a Government work.

The Coquitlam Shipbuilding and Marine Railway Co. has been organized with $500,000 capital, for the purpose of establishing a ship building yard for vessels up to about 800 tons, and repairing vessels up to 700 ft. long. L. D. Shafner, of Bridgetown, N.S., who is interested in the company, is reported to have stated that it is fully financed, that he has acquired 8½ acres at the junction of the Pitt and Fraser rivers, and that work will be commenced immediately. The plan is to build sailing vessels chiefly, ranging from 300 to 800 tons, equipped with auxiliary power, suitable for the lumber trade, between British Columbia ports and the West Indies, via the Panama canal.

Capt. E. H. Todd, of the s.s. Strathspey, has communicated to the British Admiralty, the British Board of Trade and the U. S. Hydrographic office, information relating to the navigation of the Fraser river, which is intended to correct false impressions as to the safety of navigation on the river. He states that his vessel, which is 4,432 tons gross, 2,852 tons net, entered the channel fully loaded with 6,000 tons of steel rails from Sydney, N.S., drawing 22 ft. at high water, and went up to Port Mann without having less than 2 ft. of water beneath her keel. The tidal influence is never such as to materially affect the speed, or steering, and navigation is never impeded by ice at any time of the year. Lights are well placed, pilots are skilful and trustworthy, there are several engineering shops at New Westminster, and considerable works are in progress there which will make it a thoroughly up to date port.

The contract for the construction of a steamship for the Customs service on the Atlantic coast, for which tenders were recently received, has been awarded to J. I. Thorneycroft and Co., Southampton, Eng., the price being £56,300.

List of Steam Vessels Registered in Canada during July, 1912

Name.	No.	Where and When Built.	Engines, etc.	Length	Breadth	Depth	Gross Tons	Reg. Tons.	Port of Registry	Owners.
Active	130382	Port Clinton, O., 1904	Screw 3 n.h.p.	54.9	12.5	...	34	29	Amherstburg, Ont	J. Fraser and I. M. Hackett, Amherstburg, Ont.
Adine II	130933	Stamford, Conn., 1910	" 4 "	55.6	10.9	6.8	21	14	Montreal	J. K. L. Ross, Montreal.
B. C. L	130773	Michipicoten, Ont., 1911	" 2 "	44 0	12.0	5.2	18	9	Sault Ste. Marie, Ont.	H. F. Huxtable, Michipicoten, Ont.
B.C. Express	130883	Soda Creek, B.C., 1912	Paddle 10 "	121.3	27.9	4.8	449	283	Victoria, B.C.	British Columbia Express Co., Ashcroft, B.C.
Bernice	131061	Tancook, N.S, 1912	Screw 1 "	40.2	9.8	5.0	11	10	Lunenburg, N.S.	J. Langill, M.O., Tancook, N.S.
Cecil P.I.	130957	" " "	" 1 "	41.4	10.4	5.5	12	11	"	V. Langille, Tancook, N.S.
DavisMcNab	130589	Mahone Bay, N.S., 1912	" 3 "	68.6	17.5	8.7	53	34	Halifax, N.S.	McNab Resort Co., Halifax, N.S.
Elgomar	131028	Vancouver, B.C., 1912	" 2 "	38.0	10.4	4.5	14	9	Vancouver, B.C.	H. M. Burritt, Vancouver, B.C.
Estey	131073	Lunenburg, N.S., 1912	" 1 "	43.8	10.8	5.0	11	10	Lunenburg, N.S.	N. Silver, Lunenburg, N.S.
Fredna	131143	Vancouver, B.C., 1912	" 1 "	34.7	7.6	3.7	9	7	Vancouver, B.C.	F. E. Cunningham, Vancouver, B.C.
Gene	131144	" " "	" 2 "	40.0	9.5	4.7	16	11	"	C. Wakley, Vancouver, B.C.
Hosie	131077	Tancook, N.S..,1912	" ½ "	40.0	10.0	5.0	11	10	Lunenburg, N.S.	S. Wilneff, M.O., Tancook, N.S.
John R. Stover	130431	Collingwood, Ont., 1911	" 27 "	75.0	18.2	8.1	94	45	Sarnia, Ont	Blind River Towing Co., Blind River, Ont.
Joyful	130499	New Westminster, B.C., 1912	" 8 "	49.0	14.0	5.1	31	18	New Westminster, B.C.	Canadian Tug Boat Co., Vancouver, B.C.
Kawasemi	126794	Steveston, B.C., 1910	" 24 "	39 0	8.8	4.5	11	8	Vancouver, B.C.	L. Freer, Vancouver, B.C.
Kid	131036	U.S.	" ½ "	28.8	9.0	3.7	9	8	"	E. Emmerson, North Vancouver
Laval Ferry	131102	Montreal, 1912	" 3 "	33.8	10.0	3.2	9	6	Montreal	A. Bonenfant, Bout de L'Isle, Que.
Lois M.C.	131065	Tancook, N.S., 1912	" 1 "	40.4	10.2	6.0	13	12	Lunenburg, N. S.	A. Cross, Tancook, N.S.
Marina	131051	Chicago, Ill. 1891,	" 154 "	310.5	39.1	21.3	2410	1578	Port Arthur, Ont.	J. Whalen, Port Arthur, Ont.
Massachusetts	130927	Detroit, Mich., 1882	" 92 "	244 0	36.9	18.6	1530	937	Montreal	F. E. Hall, Montreal, Que.
Merah II	130930	Lachine, Que., 1912	" 2 "	37.0	9.7	4.6	12	8	"	C. de W. Reid, Lachine, Que.
Oak Leaf	130590	Bayside, N.S., 1912	" 2 "	67.8	14.8	7.5	39	28	Halifax, N.S.	N. B. Fader, Bayside, N.S.
Ocoba	130248	Liverpool, N.S., 1912	" 1 "	30.8	8.2	4.5	15	11	Liverpool, N.S.	J. C. Bartling, Liverpool, N.S.
Pronto	131039	Vancouver, B.C., 1912	" 2 "	36.0	8.2	3.6	5	3	Vancouver, B.C.	W. Turner, Vancouver, B.C.
Quathiaski No. 5	131040	Steveston, B.C., 1912	" 4 "	52.7	13.3	6.4	37	25	"	W. E. Anderson, Quathiaski Cove, B.C.
Rosalie, L	130928	Sorel, Que., 1912	" 28 "	61.4	15.7	8.7	74	38	Montreal	Sincennes-McNaughton Line, Montreal
St. Lawrence II.	131141 130958	Vancouver, B.C., 1912	" 1 "	31.2	8.3	3.6	8	6	Vancouver, B.C.	W. N. Hoyt, Vancouver, B.C.
Shianne		Tancook, N.S., 1912	" 1 "	47.2	13.0	7.0	23	21	Lunenburg, N.S.	L. Duggan, et al., East Dover, N.S.
Sir Douglas	130989	Chatham, N.B., 1912	" 6 "	45.0	11.0	4.8	18	12	Chatham, N.B.	C. Reinsborrow, Chatham, N.B.
Sombrio Queen	130884	Victoria, B.C., 1911	" 2 "	36.0	8.6	4.6	8	4	Victoria, B.C.	J. C. Pendray, Victoria, B.C.
W. L. Forest	132613	Goderich, Ont., 1912	" 37 "	68.0	17.6	9.6	84	57	Goderich, Ont.	W. Birmingham, Goderich, Ont.
W.L.Murphy	131121	Pembroke, Ont., 1912	" 4 "	88.6	18.0	6.5	80	49	Ottawa	J. Ryan, Pembroke, Ont.

List of Sailing Vessels and Barges Registered in Canada during July, 1912

Name.	No.	Where and When Built.	Rig.	Length	Breadth	Depth	Reg. Tons	Port of Registry.	Owners.
Angus W. Robertson	130936	Montreal, 1912	Scow	110.1	28.1	7.9	199	Montreal	M. J. Haney, et al, J.O., Toronto.
C. W. Mason	131066	Lunenburg, N.S., 1907	Schr.	42.8	10.6	5.2	11	Lunenburg, N.S.	C. Mason, Eastern Point, N.S.
D'Arcy Leamy	130939	Montreal, 1912	Scow	100.1	27.9	7.0	154	Montreal	M. J. Haney, et al, J.O., Toronto.
Edward I	126936	Toronto, 1906	"	103.0	28.2	7.6	193	Quebec, Que	La C. Generale du Port de Chicoutimi, Que.
Edward II	126937	" "	"	103.0	28.2	7.6	193	"	" " " " "
Edward III	126938	" "	"	103.0	28.2	7.6	193	"	" " " " "
Edward IV	126939	" "	"	103.0	28.2	7.6	193	"	" " " " "
Edward V	126940	" "	"	103.0	28.2	7.6	193	"	" " " " "
Edward VI	131011	" "	"	103.0	28.2	7.6	193	"	" " " " "
Gyno	126880	Meteghan, N.S., 1912	Sloop	35.0	16.0	5.0	11	Digby, N.S.	F. Thomas, Westport, N.S.
H.C.R.	126297	Tancook, N.S.,1911	Schr.	43.6	12.7	6.8	18	Canso, N.S.	H. Kavanagh, M.O., Canso, N.S.
Hugh Quinlan	130937	Montreal, 1912	Scow	110.1	28.1	7.9	199	Montreal,	M. J. Haney, et al., J.O., Toronto
U. S. M	130785	Cap Rouge, N.S., 1912	Schr.	45.0	12.2	7.8	16	Port Hawksbury, N.S.	J. Semon, Cap Rouge, N.S.
Leta J. Schwartz	130959	Lunenburg, N.S., 1912	"	106.8	26.3	10.4	95	Lunenburg, N.S.	J. Schwartz, M.O., Lunenburg, N.S.
M. G. Morgan	130666	Jardineville, N.B., 1912	"	36.0	12.0	5.0	12	Richibucto, N.B.	E. Scott, Jardineville, N.B.
Margaret E	131075	Tancook, N.S., 1912	"	39.8	11.0	5.5	11	Lunenburg, N.S.	N. Fleming, Ketch Harbor, N.S.
Mattapex	131064	" " "	"	42.0	10.3	5.3	12	"	C. Scott, Indian Harbor, N.S.
Michael J. Haney	130938	Montreal, 1912	Scow	110.1	28.2	8.7	213	Montreal	M. J. Haney, et al, J. O., Toronto.
Osoris	130940	Dorval, Que., 1912	Yawl	21.6	10.3	4.8	7	"	J. B. Patterson, Montreal.
P. W. D. No. 7	130249	Scotland, 1872	Dredge	130.0	30.0	11.0	47	Liverpool, N.S.	Minister of Public Works, Ottawa
P. C. Mason	131067	Lunenburg, N.S., 1909	Schr.	42.8	10.6	5.2	11	Lunenburg, N.S.	P. Mason and C. Mason, Jr., Eastern Point, N.S
Plymouth Rock	131076	Tancook, N.S., 1912	"	48.0	13.5	7.0	24	"	O. Scott, M.O., East Dover, N.S.
Provincial No. 1	131001	St. John, N.B., 1912	Dredge	70.1	26.6	6.1	168	St. John, N.B.	Provincial Development Co. Beaconsfield, N.B.
R.M.& S.Scow No. 2	130315	Morrisburg, Ont., 1912	Scow	70.0	20.2	4.3	44	Toronto	R. Miller & Sons, Toronto.
St. Clements	130786	Eastern Harbor, N.S.1912	Schr.	47.0	12.3	6.4	12	Port Hawkesbury, N.S.	Robin, Jones & Whitman, Halifax, N.S.
T. 4	131142	N. Westm'ster, B.C., 1909	Scow	60.0	22.0	6.2	102	Vancouver, B.C.	C. A. Thompson, Vancouver, B.C.
Thorella III	131101	Dorval, Que., 1910	Sloop	39.8	8.1	2.3	4	Montreal	W. C. Findley, Montreal.
Three Cousins	131062	Tancook, N.S., 1909	Schr.	41.2	10.2	5.6	13	Lunenburg, N.S.	H. Leslie, M.O., East Berlin, N.S.
Vagabond	130640	U.S.	Sloop	35 9	11.1	3.1	7	St. John, N.B.	A. E. Everett, St. John, N.B.
Vernie, S	131033	Tancook, N.S., 1907	Schr.	38.5	9.9	4.8	10	Lunenburg, N.S.	A. Stevens, Tancook, N.S.

Electrically Propelled Vessel of the Lake Trade.

The development of the Canadian canal freight vessel offers as interesting a puzzle to the naval architect and marine engineer as any other class of boat. Nothing is more interesting than to notice how local conditions, such as exist on the Rhine, Danube, St. Lawrence or Mississippi, and other of the great natural waterways of the world, with their canal systems, prescribe a peculiar type of boat. The dimensions of the Canadian canals are of course fixed by the size of the locks through which it has to pass, but as the rush of trade at the beginning and end of the navigation season becomes more and more serious, every inducement is offered in the construction of new types to increase the deadweight carried each trip on the limiting draft of 14 ft. Hence, no doubt, the experiments now being carried on with various types of internal combustion engines, which by their lightness in weight (both of the engine itself and its fuel), enables a considerable addition to be made to the deadweight.

The latest proposal, which was referred to in Canadian Railway and Marine World for September, is that now being built in England for the Montreal Transportation Co., in which the propelling power will be generated by twin sets of Diesel engines, each of 300 break h.p. direct coupled to an electric generator, which will furnish current to the propelling motor keyed on to the propeller shaft just ahead of the thrust block. Speed change and reverse will be controlled by a simple treatment of switches which can be handled either from the bridge or engine room without reference to the generating engines, which run steadily in one direction under governor control. Either engine may be cut out for adjustment and there will, of course, be no reverse complication. The introduction of the electrical drive will, it is claimed, enable all the advantages of a twin screw arrangement to be obtained without interfering in any way with the usual form, dimensions and revolutions of the single propeller of the lake type, which has been specially designed, after years of experience with steam, to enable the canal type of boat to be quickly manœuvred in the canal channels and locks. This is a feature of great importance which, it is said, cannot possibly be obtained with a direct Diesel drive. The new vessel, which will be called the Tynemount, is to be delivered in Montreal early in the season of 1913, and its advent on the lakes will be awaited with interest. Unquestionably, marine propulsion appears to be on the eve of developments of a most revolutionary nature.

Dominion Hydrographic Steamship for the Atlantic Coast.

The contract for the construction of a hydrographic steamship for service on the Atlantic coast, for which tenders were recently received by the Naval Department, has been awarded to Swan, Hunter and Wigham Richardson Ltd., Wallsend-on-Tyne, Eng., the vessel to be completed by July 1, 1913.

A full description of this vessel was given in Canadian Railway and Marine World for July, and an illustration was given in the August issue, but we have been officially advised of the following amended particulars:—length between perpendiculars, 170 ft.; beam, 33½ ft.; draught, 11 ft.; displacement, 1,050 tons; average speed, 12 knots an hour.

The Projected Welland Ship Canal.

The route of the projected Welland ship canal has only been very generally decided upon, and there are several points which have yet to be carefully considered, and definitely settled. As soon as this has been done, the plans will be submitted to the Minister of Railways and Canals for approval. The canal generally will follow the present one from Port Colborne to Thorold, Ont., and from thence by a new route, almost direct to McCalla's Grove, situated three miles east of Port Dalhousie, the locks all being located between Thorold and Lake Ontario. The new canal will cross the present canal below lock 11 on the same level, so that smaller vessels will be able to enter either at Port Colborne or at McCalla's Grove.

The total length of the projected new canal is 25 miles, in which there will be seven lift locks, each 800 by 80 ft., and each with a lift of 46½ ft., with 30 ft. of water on the sills. J. L. Weller, M. Can. Soc. C.E., St. Catharines, Ont., is the engineer.

The Rule of the Road at Sea.—A manual on the rule of the road at sea and precautionary aids to mariners, by D. H. Hayne, has been published by the Co-operative Publishing Co., Baltimore, Md. The subject matter is, generally speaking, a digest of the rules and regulations of the Bureau of Navigation, Steamboat Inspection Service, the War Department, Bureau of Lighthouses and Coast and Geodetic Survey and the Hydrographic Office of the U.S., with general definitions, comments and applications of the U.S. laws regarding navigation, and comparisons with British navigation laws. While the work is of interest to deep sea navigators, covering as it does, the subject of icebergs, and other matters of recent public interest in that connection, it appears to be chiefly written for motor boat operators, small sailing craft, and yachtsmen. The price is $3.25, including postage.

The Profession of the Engineer.—In a volume of addresses to engineering students, J. A. L. Waddell and J. L. Harrington have collected and arranged a large number of papers and addresses written or delivered by well-known authorities on many phases of the life and work of civil, electrical, mechanical and mining engineers. The object of the editors is the providing of sound advice to students of engineering and young engineers, so as to indicate how to obtain the full benefit of the course of instruction, how best to conduct themselves at college and in after life, and how to start a successful professional career. The work has been adopted as a text book in a large number of colleges in the United States, and although only issued in 1911, has already reached a second edition. It is issued at the nominal price of $1—the cost of printing—by Waddell and Harrington, Kansas City, Mo.

The President of the British Board of Trade has appointed a departmental committee on boats and davits to report on the most efficient method of stowing, launching and propelling ships' boats.

Basing the estimate on the amount of fuel required by the s.s. Selandia of 2,500 h.p., and assuming a consumption of 11½ tons of oil a day, it is estimated that the s.s. Mauretania would require 313 tons of fuel a day, or 1,487 tons for a run across the Atlantic. It is estimated that if the Mauretania had a double hull, with 1 ft. between the two skins, she would have storage space in her sides of about 56,240 cu. ft., which would be sufficient to contain the oil necessary to carry her across the Atlantic.

Telegraph and Cable Matters.

The G.T. Pacific Telegraph Co. has opened offices at Baird, Ont., Otthon, Ebenezer and Oban, Sask.

S. F. Butzer has been appointed manager, Great North Western Telegraph Co.'s office at Sherbrooke, Que., vice H. F. Byrd.

The Canadian Northern Telegraph Co. has opened offices at Birch river, Man.; Edam, Marengo, Meota, Mistatim and Waseca, Sask., and has closed its offices at Mafeking, Man., and Fuller, Sask.

The Great North Western Telegraph Co. has opened an office at Sixteen Island Lake station, Que., and has closed its offices at Crystal Beach, Donald, Gorrie, Petawawa camp, Rosseau, Royal Muskoka hotel, Zurich, Ont., Cap Sante, Les Eboulements wharf, Manoir Richelieu, Montfort station, Pointe au Pic and Verdun, Que. Its office heretofore known as St. Constant jct., Que., will in future be known as Delson jct.

Wireless telegraph service will be instituted between New York city and Norway, according to an announcement of the Marconi Co. of America. The United States plant will be owned and operated by the company, while the Norwegian station will be government property. The receipts of the two stations are to be pooled and divided equally between the company and the Norwegian government. The company will receive $350,000 for the foreign station, exclusive of site and foundations (about the price to be paid by the British government for each station in its proposed imperial system), and will secure a royalty of 10% of the gross receipts for 25 years.

Further negotiations between the C.P.R. and its telegraphers regarding rates of pay, etc., were reported to have been concluded, Sept. 18, the company having granted an all round increase of 12%, including overtime, and establishing a 10 hour day standard, instead of 11 hour, as hitherto. D. McNicoll, Vice-President, is reported to have stated that a definite settlement of all matters at issue had been arrived at, and a final agreement would be drawn up. It was also stated that the minimum wages paid to operators at the smaller stations was $65 a month, and for night operators $53 a month, the agents at larger stations receiving $80 to $110 a month, and operators $70 a month under the old schedule. The board of conciliation, which dealt with the matter some time ago, recommended an increase of 10%, which the company accepted, as mentioned in our last issue.

It is announced that the Western Union Telegraph Co., on account of representations made by the Postmaster-General of Great Britain and Canada, has made reductions in cable rates, as follows,—for cables in plain words, the present deferred rate of 12c. a word, reduced to 9c., and instead of being subject to 24 hours' delay, will be transmitted with only the delay necessary to give priority to the full rate cables; a lettergram service will be inaugurated, the rate being 72c. for 12 words, and 5c. for each additional word, to be delivered on the morning of the day following handling; the week end letter cable rates will be, $1.08 for 24 words, with 5c. a word additional, delivery on Monday; press cables reduced from 10c. to 7c. a word (already in force, but the nine hours' deferment is eliminated). In addition to the foregoing there will be a special press rate, between 12 midnight and 6 a.m., of 5c. a word, and these rates are also applicable between 1 and 4 p.m., Montreal time, equivalent to 6 and 9 p.m., London time, and messages are not subject to deferment.

Car Ferry Service Between Prince Edward Island and New Brunswick.

By A. K. Kirkpatrick, M. Can. Soc. C.E., Professor of Civil Engineering, Queen's University, Kingston, Ont.

The various routes examined between Prince Edward Island and the main land of New Brunswick, with a view to establishing a car ferry, are as follows: Richibucto to West point, Richibucto head to West point, Buctouche to West point, Shediac or Pointe du Chene to West point, Shediac or Pointe du Chene to Summerside, Cape Tormentine to Summerside, Cape Tormentine to Carleton head, Pugwash to Carleton head, Pugwash to Charlottetown, Wallace harbor to Charlottetown, Brule harbor to Charlottetown, John bay, Amet sound to Charlottetown, Pictou to Georgetown, Pictou to Murray harbor, Pictou to Charlottetown, which will be taken up separately.

ICE CONDITIONS. The bord or shore ice forms at all ports and will be taken up when considering each harbor, as it varies in each case, due to the configuration of the shore, depth of water, and exposure.

The pan, rafted, berg, gulf, and lolley ice may be considered under one head, although it varies in quantity in the different places, due to the tides, winds, and shape of the shore, etc.

Pan ice, being the areas of flat ice which forms in the straits and drifts back and forth with the tides and wind, and varies in thickness 6 to 20 ins., would not prove a serious obstruction to a car ferry built on ice-breaking principles.

Rafted ice, or piled ice, is the ice that is piled one cake upon another, usually at the outer edge of the bord ice, where a large field of pan ice, under motion due to the winds and tide, meets an obstruction in its path, such as the edge of the bord ice. Rafted ice may be formed between two large fields of pan ice of which one or both are in motion. The pan cannot be stopped at once, and the immense force behind drives the ice in front, on top, and under the bord ice, in some places grounding in 25 ft. of water, and piling up 10 or 12 ft. above water level. If this takes place at low temperature, this piled ice is frozen into a solid mass.

The rafted ice usually forms at headlands, and grounds on the reefs extending out from the headlands, forming a protection to the bord ice under the lee. It also forms at the edge of the bord ice on straight stretches or bays, where there is sufficient fetch to permit the field or heavy pan ice to get in motion due to the heavy wind, therefore not necessarily forming to the same extent in the same place each year. This rafted ice forms some of the objections of the proposed terminals, and the overcoming of these difficulties may be provided for in the design of the vessel.

Berg ice is only encountered in the spring, when the break up occurs, and is chiefly composed of the rafted ice along the bord ice, which piles on the reefs, breaking loose and drifting with the tide. The evading of these is a matter of navigation.

Gulf ice may be encountered after the break up occurs, and chiefly consists of heavy fields of pan ice, bord ice and rafted ice, from along the shores of the gulf, breaking loose and being driven by the winds into the tidal currents of the straits.

Lolley ice, though not dangerous to navigation, which may slow down the speed of a large steamer, for which provision has to be made in designing the details of the engines, is encountered in the Northumberland strait when the weather is favorable to its formation. From a rough examination of the crystals, and inquiring as to the conditions of the weather previous to its appearance, I conclude that it is a mixture of anchor and frazil ice. It appears in the form of a heavy dense slush, and sometimes to the depth of 10 or 15 ft., and is buoyant enough to bear up a man when standing on an oar or a plank placed on the ice. The frazil ice crystals are probably formed in the cold water when the temperature of the atmosphere is very low, and a wind stirs the water surface and prevents the surface ice from forming.

The anchor ice, with its sponge like form, is formed on the bottom during very cold, clear nights when the radiation is great. When the sun rises high and its rays penetrate to the bottom, it frees the masses formed, or they break away from the bottom owing to the force of the current.

The ice drifts back and forth with the tide and wind, but the preponderance of the drift is eastward. The young ice forms in the western portions of the straits, and eventually fetches up in the eastern end of the straits, and gains in thickness from snow and frost as it ages.

Car Ferry Marquette and Bessemer No. 2, Forcing Through Piled Ice, on Lake Erie.

The littoral drift is principally southward and eastward, due to the prevailing winds and configuration of the shore, and in developing some of the harbors along the straits the littoral drift has to be seriously considered when designing permanent improvements.

RICHIBUCTO HARBOR, N.B. Bord ice forms only a short distance out from the entrance, and is liable to go out a couple of times during the winter, depending on the direction and force of the wind, and on account of its exposed position. A north to northeast wind, with a large field of pan ice, is liable to cause heavy rafted ice across the entrance. The ice in the harbor makes to the depth of from 18 to 24 ins. The old entrance to the east is now partially closed and has only about 10 ft. of water over the bar at low water, and it is only a matter of time until it will be completely closed by the littoral drift. The new entrance to the east of the breakwater may be improved by the construction of a jetty, but on account of the exposed position at least 24 ft. of water would be required at this entrance across the bar. This depth would be difficult to maintain, on account of the littoral drift, also the stopping of the drift to the west of the breakwater is eventually going to weaken the sand beach to the east of the jetty if built, and cause a break, which will weaken the ebb and flow through the channel on which it would rely for its maintenance. This harbor would be very difficult, if not impossible, to make in a north to northeast gale and an ebb tide, on account of the sea and shoal water. Once inside there is a good protection and plenty of water. Good position for a slip could be secured, and when once dredged could easily be maintained.

AT RICHIBUCTO HEAD, N.B., the bord ice forms at from 1,000 to 1,500 ft. out from the shore, and is liable to heavy rafted ice on account of the exposure. Gulf ice may be met with in the latter end of March and April, when the winds are favorable for its movement to this point. This occurs occasionally, not annually. An artificial harbor, as well as about nine miles of railway, would have to be constructed, including the bridging of the Richibucto river, if it were to be considered for one of the termini of the car ferry service. The bord ice forms as far out as the outer bar, and sometimes rafts heavily at this point, and is liable to go out a couple of times during the winter, depending on the wind and tide. East and west breakwaters would have to be built, enclosing a sufficient area to allow for the manoeuvring of a large vessel, and the exposure that it has and the distance required to go out to get deep water, would make this proposition a very expensive one, and with a northerly gale it would be a question whether the harbor could be entered.

BUCTOUCHE HARBOR, N.B., is protected by a sand beach, along the shore of which there is considerable littoral drift. The entrance is at the east end of the spit and is obstructed by a stone ledge upon which there is only 12 to 14 ft. of water at low tide. There is also an outer bar of sand, on which there is only 14 to 18 ft. of water at low tide. All that can be counted on in the

inner harbor is 16 to 18 ft. at low water. To give 20 ft. of water at low tide to this harbor and its approach would entail a very large expenditure, and great difficulty and expense in maintaining an entrance channel, on account of the littoral drift.

POINTE DU CHENE, N.B. The bord ice forms for about 1¼ miles out from the present pier, and is subject to raft ice under favorable conditions, with a northeast to southeast wind. There are several rock ledge shoals covering the entrance to this harbor, and it is 2¼ miles from the pier head before a depth of 20 ft. at low water can be obtained. This would necessitate the dredging of a channel 2¼ miles long, a part of which would probably be through solid rock. This channel, when dredged, would be expensive to maintain, on account of its exposed position and the littoral drift, as it is exposed to the northeast sea until under the lee of the breakwater or railway wharf.

CAPE TORMENTINE, N.B. The bord ice at Cape Tormentine forms at a straight line from the outer end of the shoals at Cape Jourimain and Tormentine reefs, upon which the ice piles and grounds, and forms a protection to the bord ice. There is a strong tidal current at this point, and between here and the island shore a curious condition of the tide is found, slack water occurring at both shores first, and the reversal of the tides and slack water working out towards the centre, so that the reversing of the tide in the centre of the straits is from 1 to 1½ hours later than on either shores. This condition of current has a tendency to open up leads in the pan ice when the straits are full. A considerable amount of lolley ice is encountered here during severe cold weather. Rafted ice may form at this point when a large field of pan ice is moving under a northeast gale at the flow of the tide. An extension to the present pier would be required, with slip and apron, and a short breakwater protecting them from the seas from the east, the amount of dredging varying with the length of pier extension. The tide varies from 3 to 6 ft. fall in neap and spring tide, with a 3 knot current in the straits.

PUGWASH, N.B. Bord ice forms for about half a mile outside of Pugwash reef, and it is liable to rafted ice with winds from a northerly direction, ice in the roads forming about 18 ft. in thickness. There is a clay bar across the entrance opposite Fishing point lighthouse. A channel would have to be dredged across this bar and the roads, to the channel side of the middle grounds to deep water in the harbor, this distance being about a mile. There are some rock ledge shoals covering the entrance to this harbor about two miles from the bar. The only position available for the slip and railway connection is just outside of the present wharves at Oxley point. The tide at this point is from 4 ft. neap to 7 ft. spring, and causes a current at the narrow part of the channel of about 3 miles an hour. There would be great difficultv in turning a vessel in the narrow river, with the strong current.

WALLACE HARBOR, N.B. Bord ice forms about a mile out, and is subject to rafting with a northeast wind. Harbor ice makes about 18 ins. thick. There is a sand bar covering the entrance, which would require to be dredged. There is from 25 to 35 ft. of water at low tide inside the bar.

The harbor is exposed to a wind from the northeast to east, but a landing slip could easily be protected by a short breakwater. The Dominion Coal Co. contemplate building a coal pier at this point, which will necessitate dredging a channel through the bar and berth of the pier. The greatest difficulty would be in getting a low line for the railway, with shunting grounds, in proximity to the slip. The shore is bald and quite high and of sandstone formation. The connecting link to the Intercolonial Ry. would be about 7 miles.

TATAMAGOUCHE HARBOR, N.B., is exposed to the east wind, and is very shallow and would require extensive dredging and is out of the question for the formation of a harbor.

BRULE POINT, N.B., which is on Tatamagouche bay, is exposed to northerly winds, and would require breakwaters to be built and a considerable amount of dredging to get the necessary draught of water. The connecting link to the I. R. C. would be about 7 or 8 miles in length, through bald country.

BRULE HARBOR, N.B., which is a part of Tatamagouche bay, is well protected, but would require a channel to be dredged for about ⅞ of a mile and a turning basin at landing slip. The railway to connect Brule harbor with the I. R. C. would be about 5 miles long.

SALISBURY POINT, N.B., or John bay, which is part of Tatamagouche bay, has 20 to 25 ft. of water at low tide, at reasonable distance from the shore, and, with the breakwater, good protection could be obtained for a landing slip. The railway connecting link would be about 3 miles.

The ice conditions for Tatamagouche harbor, Brule point, Brule harbor and Salisbury point are all similar, being in Tatamagouche bay. The bord ice forms across the entrance to the bay, from 18 to 24 ins., and raft ice piles on the shoals and at the edge of the bord ice. There is a deep water entrance to Amet sound, less than a mile wide, and flanked by the Amet and Waugh shoals, through which there is a heavy current due to the tides, and it would be a difficult place to enter during thick or foggy weather.

PICTOU HARBOR, N.S., has good water inside of bar. Channel crooked over bar, but well lighted with range lights; 2½ to 3 knot current over bar. Bord ice sometimes forms from Lagan point to McKenzie head, and is liable to rafting, with a northeast wind. Heavy drift ice is liable to choke up in the bay formed between Pictou island and the mainland. Tides, spring rise 6 ft. and neap 4 ft. Ice forms in the harbor from 12 to 18 ins. thick.

GEORGETOWN HARBOR, P.E.I. There is good water in this harbor, but it is exposed to a southeast blow. The bord ice forms from 12 to 24 ins. thick, about a mile out, and is subject to rafting with a southeast wind. The bord ice, for a considerable distance in from its edge, is liable to move out several times during the winter, if tide and wind are favorable. Heavy field ice is liable to jam into the harbor, with northeast or southeast winds. A landing slip could be protected by making the easterly leg long enough to provide shelter behind it. There is no current to speak of in this harbor. Tides, spring rise 5 ft., neap 3¼ ft.

MURRAY HARBOR, P.E.I. Bord ice forms across the entrance of this harbor, and is liable to raft heavily. The entrance is exposed to the east winds and is narrow and flanked by shoals. There is a bar across the entrance, through which a channel would have to be dredged. There would be great difficulty in maintaining this channel on account of the littoral drift. When once inside there is good protection, but considerable dredging would be required to deepen and straighten the channel and give a turning basin. There is a branch of the P.E.I. Ry. to this point.

CHARLOTTETOWN, P.E.I. There is good water inside this harbor and land locked when inside the narrows. Ice forms from 18 to 24 ins. thick. Current 2½ knots at spring tide ebb, through Battery point to quarantine hospital. Bord ice forms from Point Prim to St. Peter's island, and is subject to rafting. Under favorable conditions the first ice may raft in one or more windrows inside of the final edge of bord ice to the depth of from 4 to 8 ft. There is a good site for landing slip east of the railway wharf, with plenty of room for turning basin. Tide, spring rise 9 ft. and neap 8 ft.

CAPE TRAVERSE, P.E.I. There is too much littoral drift at this point, and too far to go to obtain deep water.

CARLETON HEAD, P.E.I. The bord ice forms from 18 to 30 ins. thick from the outer end of the piled ice on the reef at Carleton head, to a corresponding point out from Cape Traverse. The early ice is liable to raft in one or more windrows inside of this line. In 1903 the most severe conditions were reported, when it is claimed that the rafted ice grounded in 25 ft. of water in some places. The conditions of the tidal currents and ice in the straits are the same here as at Cape Tormentine. Good water is to be had for a landing slip about 2,000 ft. east of Carleton head, under protection of the point and at a short distance from the shore. This would necessitate the building of a connecting link with the P.E.I. Ry., Cape Traverse branch, of about 2 miles. Tide, spring rise 5 ft. and neap 3 ft.

SUMMERSIDE OR BEDEQUE HARBOR, P.E.I. Bord ice forms from Sea Cow head to the Muscouche banks, with a probable rafting of earlier ice in one or more windrows inside of this line. Under favorable conditions the rafted ice at the edge of the bord ice may be quite heavy. The harbor is well protected when inside of the breakwater. There is considerable littoral drift from the west. The channel would require straightening and deepening inside of the breakwater, part of which work the Public Works Department contemplates doing during 1912. A suitable site can be obtained for a landing slip, with railway connection.

WEST POINT, P.E.I. The bord ice forms in a long, easy sweep from the shoal off West point to Cape Egmont, and is subject to heavy rafting and piling under favorable conditions, when the piled ice will ground in four fathoms of water and is from 20 to 50 ft. wide. This point is exposed to winds from the south and west and with a gale from north to northeast the heavy seas swing round the point and cause a heavy undertow. Two breakwaters would have to be constructed enclosing a large enough area for turning basin. About 10 miles of line would have to be built to connect with the P.E.I. Ry. There is considerable littoral drift to the south and east. The drifting ice is seldom very heavy, and nearly always some open water may be seen, the position of the ice depending on the wind and tide. The current varies from 3 to 4 knots, the heaviest being during the June tides.

TRAFFIC. The summer and fall trade with Cape Breton and the Nova Scotia mainland, especially from the east end of P. E. Island, will not be affected by the car ferry service no matter where the ferry is established, as the water rates will be less than the rail rates. It is the summer shipments to points south and west, and the winter shipments to all points that will be benefitted by the ferry service. With the opening up of continuous winter communication the produce now rushed out in the fall or held over until spring will find an outlet during the winter at better prices, and will very likely affect the direction of the traffic, the bulk of it passing through Moncton on its way to Boston, Montreal, Ottawa and the Cobalt district, Ont. The heaviest passenger travel will also be through Moncton, so that the most

direct route to Moncton, with the most feasible crossing of the straits, should be the one which will benefit the greatest percentage of people on the island. Such being the case this will eliminate the Georgetown and Pictou route. the Charlottetown and Pictou route and the Murray harbor and Pictou route.

HARBORS NOT FAVORABLE. The harbors that are not favorable for the terminus of the car ferry route are as follows:—

Richibucto, on account of its exposed entrance, and difficulty in maintaining a sufficient depth of water over the bar.

Richibucto head, on account of its exposed condition, and difficulty and expense in building and maintaining an artificial harbor, and the construction of about nine miles of railway.

Buctouche harbor on account of its exposed entrance, the expense of removing the solid rock bar across the entrance and the difficulty and expense in making and maintaining sufficient depth of water across the bar.

Pointe du Chene, on account of the expense and difficulty in maintaining a dredge channel 2¼ miles long. with a 20 mile exposure and at right angles to a heavy sand drift.

Pugwash, on account of being cramped for room, and the difficulty of turning a large vessel in the narrow channel in a swift current, and the rock ledge shoals covering the entrance to the dredge channel which would require to be about a mile long.

Tatamagouche, on account of being shallow.

Brule point, on account of its exposed position, and amount of breakwater and dredging required.

Murray harbor, on account of its exposure and difficulty of maintaining a channel across the bar.

West point, on account of its exposed position, and the difficulty of building and maintaining an artificial harbor.

ROUTES. The harbors that are considered unfavorable eliminate the following routes: Richibucto to West point, Richibucto head to West point, Buctouche harbor to West point, Pointe du Chene to Summerside, Pugwash to Charlottetown.

The following routes are eliminated on account of the ice conditions and length of haul for the preponderance of the traffic: Georgetown and Pictou, Murray harbor and Pictou, Charlottetown and Pictou.

This leaves Cape Tormentine, Wallace harbor, Brule harbor, and Salisbury point on the mainland, and Charlottetown, Carleton head and Summerside on P. E. Island, to be considered, with the various routes that might be established between these points. The mileage of the various routes remaining to be considered is as follows:

CHARLOTTETOWN AND TATAMAgouche Bay Routes. In these routes, a course common to all, which is about 20 miles long, is from light to light. One of the drawbacks to this common route is the uncertainty of the tidal currents, and their effect on running a compass course in thick or foggy weather, as evidenced by the grounding of the Earl Grey at Tonny river, her crippled condition very likely contributing to the accident. Another drawback is the shoals which beset the entrance to either harbor. For these reasons it would be safer to have a shorter route and one by which the termini could be approached by signal as well as lights.

CARLETON HEAD TO CAPE TORMENtine. The tidal currents are stronger at this point than at any other, being 3½ knots, but the shortness of the route, a distance of 8 miles, and the openness of approach, would enable the making of the landing stage by sound, during thick or foggy weather. The difference of mileage of Charlottetown and Summerside, from Sydney, Halifax to Moncton via Carleton head and Cape Tormentine, as seen in the table of mileage of various routes, is that Charlottetown is further from Sydney by 145 miles, from Halifax by 66 miles, and nearer to Moncton by 30 miles, than by the shortest route, i.e., by Salisbury point. Summerside is further from Sydney by 81 miles and Halifax by 2 miles, and nearer to Moncton by 94 miles than by the Charlottetown-Point Salisbury route, and as the bulk of the Sydney trade will still be done by water the difference in mileage bears a small part.

SUMMERSIDE AND CAPE TORMENtine Route. The length of this route is about 20 miles, and would increase the haul on freight secured east of Emerald junction by 14 miles and decrease the haul secured at Summerside and west by 19 miles. But the objection to this route is the danger in navigating the straits in thick or foggy weather, due to the liability to overrun, or under run, one's course owing to the uncertainty of the tidal currents, especially near change and full, and the increased distance in which ice may be encountered.

ROUTE RECOMMENDED. Having considered all the conditions as to harbors and their improvements and maintenance, the routes, their lengths, safety of navigation and probable preponderance of traffic, I am of the opinion that the Cape Tormentine and Carleton head route will be the best and safest route of all those to be considered, will serve the convenience of the greatest number of people, and can be operated daily under all weather conditions by a properly designed steamer, adequate shore signals, and landing facilities.

[Editor's Note. Acting on the recommendation in the above paragraph of the report the Minister of Railways and Canals has selected the Carleton head-Cape Tormentine route. Carleton head is on the south coast of P. E. Island, and on the north shore of Northumberland strait, about 3 miles northwest of Cape Traverse, which is the terminus of the P.E.I. Ry. Cape Traverse branch, which leaves the main line at Emerald junction, 31 miles west of Charlottetown and 16.8 miles east of Summerside, the branch being 11.8 miles long. A connection of about 2 miles will have to be built from this branch, from between Albany and Cape Traverse to Carleton head. Cape Tormentine is on the northern coast of New Brunswick and south shore of Northumberland strait. It is reached by the New Brunswick and Prince Edward Island Ry., which runs from the Intercolonial main line at Sackville, N.B., 36 miles. The N.B. & P.E.I. Ry. will probably be acquired by the Government and made part of the I.R.C. system. The direct distance across the strait from Carleton head to Cape Tormentine is about 9 miles. —Editor.]

	To Sydney.	To Halifax.	To Moncton.	Via
Charlottetown	244	173	159	Salisbury point.
"	247	176	152	Brule harbor.
	271	200	135	Wallace harbor.
	389	239	129	Cape Tormentine.
Summerside	292	221	207	Salisbury point.
	295	224	200	Brule harbor.
	319	248	183	Wallace harbor.
	372	223	113	Cape Tormentine.

DESCRIPTION OF CAR FERRIES. The following is a short description of some of the car ferries and ice breakers built in various parts of the world:

The Maryland in the fifties ferried the Philadelphia, Wilmington and Baltimore cars across the Susquehanna and transferred to the East river, New York. Capacity, 2 tracks, 14 freight cars.

The Louise was built in the sixties, was built to run between San Francisco and the Oakland Rd.

The Transfer was built in the early seventies to transfer cars across the Detroit river between Amherstburg and Grosse isle, for the Chicago and southern railways.

The Express, the first ice breaker, was built in 1887 at Oscarshamn, Sweden. Length 139 ft., beam 22½ ft., draught, loaded, 11½ ft., i.h.p. 400, speed 11 knots.

The Isbrytaren, an ice breaker, was built in 1881 in Sweden, to keep open Cathenburg harbor. Length 131½ ft., beam 34 ft., draught 12½ ft., i.h.p. 700.

The Oland was built in 1883 at Stockholm. Length 105 ft. 5 ins., beam 24 ft., draught 7 ft., i.h.p. 290, speed 10 knots.

The Bryderen was built in 1885 at Malmo, Sweden. Length 142 ft., beam 32 ft., draught 13 ft., i.h.p. 900, speed 11 knots.

Cape Charles was placed in the early eighties by the New York, Philadelphia and Norfolk Rd. as a transfer steam boat on the route from Cape Charles to Old Point Comfort, across the mouth of Chesapeake bay. Length 259 ft., beam 36 ft., draught 7 ft., capacity 4 passenger cars, speed 18½ miles.

The Solano was put in service in the eighties across the Straits of Carquiney on the line of the Northern Rd., leased to the Central Pacific Rd. The current in these straits runs at 8 miles an hour and the range of tide is 9 ft. Length 424 ft., beam 64 ft., draught 6½ ft., capacity 48 freight cars, or 24 passenger cars, length of run 1 mile.

The Switzer was built in 1885 at Copenhagen. Length 135 ft., beam 25 ft., draught 9¾ ft., i.h.p. 800.

The Starkodder was built in 1885 at Copenhagen. Length 150 ft., beam 27 ft., draught 10 ft., i.h.p. 900, twin screws, speed 11 knots.

The Ice Boat No. 2, a side wheeler, was built in Philadelphia, about 1886. Length 196 ft., beam 29½ ft., draught 10¼ ft.

The Finnish Government designed a steam boat to take the place of the Express. Length 181½ ft., beam 27 ft., draught 13 ft., speed 11½ knots, i.h.p. 650, four bladed cast steel propeller.

The Detroit, a car ferry ice breaker, was built in 1905. Capacity 24 cars, tracks 3, length 308 ft., beam 64 ft., draught 14 ft., screws twin at each end, owner Michigan Central Rd., run Detroit, Mich., to Windsor, Ont.

The Drottning Victoria, a car ferry built in 1909, one of the four of this class between Sassnitz, Germany, and Trelleberg, Sweden, distance 65 miles. Length 370 ft., beam 53½ ft., draught 16½ knots, h.p. 4,400, not an ice breaker. Built at Walker-on-Tyne, England., owners, German and Swedish governments.

The Odin, a car ferry, was built in 1909, to ply between Korson and Nybork, Denmark. Length 293 ft., beam 48½ ft., draught 12½ ft., twin screws, i.h.p. 1,800, speed 15 knots, load 300 tons of cars.

The Christian IX., a sister ship to the Odin, was built in 1908.

In Denmark there are eight connections of railway ferries, their sailing distances ranging from 1 to 26 miles. Over 18 car boats are owned by the Government for working the traffic over these routes. Special ice breakers are in use to keep navigation open during the winter.

The Elsinore was built to act as ferry and ice breaker, her dimensions being: Length 179 ft., beam 43 ft., draught 10 ft., single track capacity 7 cars, single screw at each end.

Four car ferries were built later to accommodate the traffic, two by the Danish government, and two by the German government, two screw boats and two paddle boats, the paddle boats for use in summer only. Length 280 ft., beam 60 ft., draught 13½ ft., i.h.p. 2,600, speed 14 knots.

The car ferry system has also been adopted at the following points: Across the Straits of Messina, the Nordser canal in Holland, also from the Rugen island to Stralsund in Pomerania, and at other points given in this report.

The Ontario no. 1, car ferry and ice breaker on Lake Ontario, cost $370,000, cars 24, staterooms 100 passengers, length 320 ft., beam 56 ft., draught 15 ft., speed 15 miles, screws twin aft, owner Grand Trunk Ry., built 1906.

The Ermack, ice breaker, not a car ferry. Length 305 ft., beam 71 ft., draught 23 ft. Three stern propellers and one bow propeller, i.h.p. 2,500 each set of engines, with 8,000 h.p., speed 15¼ knots. All engines running 16½ knots forward propeller 13 ft. diameter. All propellers, nickel steel blades (tensile strength 80,000 lbs. per sq. in.). Has steamed through field ice 18 to 24 ins. thick with 6 ins. of snow on top at speed of 8 knots. Went through 1-3 of a mile of rafted ice 20 to 25 ft. thick in two hours. On her trip to Spitzbergen she encountered Polar ice 12 to 14 ft. thick, through which she forced her way at 2½ knots an hour.

The Urimack is a sister ship to the Ermack and has engines of i.h.p. 10,000, triple screws, two at the stern and one at the bow. She is used to keep open navigation through 45 miles of ice to Vladivostock harbor.

The Neva is another Russian boat of the same dimensions and power as the Ermack.

The Finnish ice breaker Sampo. Length 232 ft., beam 45 ft., draught 18 ft., i.h.p. 2,500.

Experience with the Ermack, Urimack, Neva and Sampo has shown that pack ice of practically any thickness can be negotiated. The Ermack on one occasion encountered pack ice 34 ft. thick, 9 ft. being above the level of the field through which she successfully forced her way.

The Baikal, an ice breaker and car ferry on Lake Baikal, Russia. Length 290 ft., beam 53½ ft., draught 18½ ft., 2 screws aft and one forward.

The Delaware, an ice breaker. Length 232 ft., beam 45 ft., draught 13 ft., speed 15 miles, aft engines 2,400 i.h.p., forward engines 400 i.h.p. Two screws aft and one forward, has also a water line deck without camber or sheer, to give additional stiffness, and prevent her being crushed in by moving ice packs.

The St. Ignace, built in 1889. Length 235 ft., beam 52 ft., bow and stern propellers, capacity 10 freight cars, speed 15 miles. This was the first boat built with a bow propeller.

The Sainte Marie, built in 1893. Length 305 ft., beam 53 ft., bow and stern propellers, capacity 18 freight cars, speed 16 miles an hour.

The St. Ignace and the Sainte Marie were designed by Frank Kirby, and built at Detroit, Mich., for summer and winter navigation in the Straits of Mackinac, for the Duluth, South Shore and Atlantic, the Michigan Central and Grand Rapids and Indiana railroads, to make the connecting link between the upper and lower peninsulas of Michigan, the run between Mackinaw city and St. Ignace being 8 miles. Pere Marquette no. 2, no. 15, no. 19 and no. 20, are all similar and were designed by R. Lagan.

The Pere Marquette no. 20. Length 350 ft., beam 56 ft., draught 14 ft., i.h.p. 2,500 each, twin screws aft, speed 14 miles, 4 tracks, 30 steel coal cars.

The photograph of the Marquette and Bessemer no. 2 forcing her way through piled ice on Lake Erie gives some idea of the class of steam boat used on the Great Lakes for car ferry service. Two of these vessels were lost about 18 months ago, one on Lake Erie, and the other on Lake Michigan. The cause for the one on Lake Erie has never been determined as she has not been found and all hands perished. The loss of the one on Lake Michigan was attributed to leaving the bow port hole lights open when leaving the harbor, and not being discovered until too late to close against the inrush of water, and not being provided with collision bulkhead she filled and foundered.

No. 1 for carrying coal in bulk loaded from tracks on her decks. Length 255 ft., beam 43 ft.

No. 14 has three tracks and is an open deck, and used for transferring cars across the Detroit river. Length 351¾ ft., beam 52 ft.

No. 1 and no. 14 were designed by Frank Kirby, all for the Pere Marquette Steamship Co.

THE TYPE OF VESSEL that would be best adapted for the Northumberland straits would be one between the design of the Delaware and the Bessemer and Pere Marquette types. It should have an ice crushing bow, with bow propeller of special nickel steel, and engines of 200 i.h.p., twin screws aft, with engines of 2,500 i.h.p. each, sea cocks as designed for encountering lolley ice, heavy ice, belt plating, stiffening deck without camber or sheer at water level, to protect hull against pinching by moving ice flows, two railway tracks to accommodate 5 freight cars each, and to load and unload over the stern, and accommodation for passengers as well as crew. This would necessitate a boat about 280 ft. long, 50 ft. beam, 16 ft. draught light and about 18 ft. draught under full load, which would be able to negotiate any of the ice conditions to be found in the straits. Approximate mathematical calculations as to the proper shape of forefoot of ice breaking steamer, and the thickness of ice a given steamer is capable of breaking, were worked out by R. Runenburg, and may be found in Proceedings of the Institute of Civil Engineers, paper 2371, 1891.

CONFIRMATION. Might I suggest that this report be confirmed in its various details as follows: By E. Tiffin, General Traffic Manager, I.R.C., as to the traffic; by F. P. Brady, General Superintendent, I.R.C., as to maintenance and operations; by W. B. Mackenzie, Chief Engineer, I.R.C., who has made a study of this question for some years, and has some valuable information collected, as to the construction, etc.; also by some independent master mariner who is conversant with the navigation of the straits.

I believe that their confirmation of this report would materially strengthen it, and help to allay the feeling of discontent and disappointment that is sure to arise in the places which have been looking forward to having the terminus of the car ferry established at their port.

The foregoing report was made to the Minister of Railways and Canals, who commissioned Prof. Kirkpatrick to investigate the question.

An Ottawa dispatch of Sept. 4, stated that the Railways Department had received several tenders for the construction of the car ferry, from British and U.S. firms.

Lake Vessels and Pilotage Dues in Montreal Harbor.

It is probable that, during the next session of Parliament, amendments will be made to the Canada Shipping Act, regarding pilotage dues in Montreal harbor, in so far as vessels trading from the great lakes are concerned. It is contended that the present regulations constitute a discrimination against vessels from the lakes entering Montreal harbor, as they are compelled to take on a pilot at the mouth of the Lachine canal, or pay the pilotage dues, and also pay a moving charge when changing from one point of the harbor to another, while vessels trading from Quebec are not compelled to take on a pilot, nor pay pilotage dues.

In this connection representatives of the Dominion Marine Association, the Shipping Federation of Canada, and the Pilotage Association, recently met the acting Premier and the Deputy Minister of Marine, to discuss the fulfilment of an arrangement made earlier in the year, whereby assent would be given to the abolition of the pilotage moving charge in any part of Montreal harbor, if the owners of lake vessels would support a scheme for the arrangement and enforcement of regulations governing the traffic in the harbor. The regulations were prepared, revised and sanctioned by both the Dominion Marine Association and the Shipping Federation, and the interview was arranged chiefly to settle the limits within which exemption should be given from the moving charge which lake vessel owners contend is simply a tax on the vessel. The Dominion Marine Association asked that the agreement arrived at be carried out if the regulations now proposed were put in force. The Shipping Federation and the Pilotage Association however contend that exemption from the moving charge should be confined within the limits covered by the regulations. Ultimately it was decided that the approved regulations should be put in force, and that the moving charge be abolished, only within the same limits, which include that part of Montreal harbor extending from its western limit as far east as the eastern limit of the section which includes the Sutherland pier, just east of the Tarte pier. The Dominion Marine Association remains opposed to the imposition of the charge within any part of the harbor, and stays on record as in favor of its complete abolition.

Internal Combustion Engines for Dredges.—A somewhat new line of development in the application of internal combustion engines is the operation of dredges, and two dipper dredges operated in this manner are now at work on drainage ditch excavation in Iowa. The dredges are in general standard designs of the Marion Steam Shovel Co., which supplied the machinery, the special feature being the application of oil engines instead of steam engines for the hoists. The engines were supplied by Fairbanks-Morse & Co. The dredges were built for D. C. Stephens, contractor, of Buffalo, N.Y., and the design of the hull was modified to suit the engine equipment. Compressed air is used in raising steam in the auxiliary boiler.

The Dominion Government has approved the Montreal Harbor Commissioners' by-law prescribing a system of signals, consisting of semaphores by day and lights at night, for use in the Montreal harbor from the Tarte pier to the Lachine canal. Hitherto small vessels have passed from point to point without any system, causing a number of minor accidents, and endangering shipping.

The Diesel Engined Vessel Eavestone.

The preliminary trials of the vessel Eavestone, built at Middlesbrough, Eng., for Furness Withy and Co., which took place recently, are considered to have been extremely successful. Her dimensions are:—length, 276 ft.; breadth, 40½ ft. moulded beam, with a deadweight capacity of 3,600 tons. She is engined by Carels-Diesel engines of the four cylinder, two cycle type of 850 h.p., with a service speed of 115 r.p.m., being practically a duplicate of the engines supplied for the Canadian Interlake Line's vessel Fordonian.

The construction is comparatively simple, there being an open crank pit, with box columns supporting the cylinders, and the open crossheads working the air scavenging pumps. Comparing the vessel with a similar one of the steam driven type, the extra space available for cargo on a 30 days' trip amounts to about 400 tons, due to the less space taken by the machinery. In the course of the trials, the engine was kept running at full load for over nine hours and no trouble of any kind was experienced, and on her maiden trip to Antwerp, Holland, the governor was set for 86 r.p.m., and when the propeller was thrown out of the water, the maximum speed was 92 r.p.m., coming back to 86 r.p.m. in less than five seconds.

It is said that Furness Withy and Co. may place the vessel on its Canadian service.

PATENT ACT.

TAKE NOTICE that manufacture of Nut-Locks constructed in accordance with Canadian Patent No. 128,091, issued September 13, 1910, to Milton Bartley, has been commenced in Canada by W. H. Banfield & Sons, of the City of Toronto, who are prepared to supply any demand for the same at a reasonable price. Ridout & Maybee, 59 Yonge Street, Toronto, Attorneys for the Patentees.

Railway and Allied Associations, Clubs, Etc.

The names of persons given below are those of the secretaries.

Canadian Car Service Bureau, J. E. Duval, 401 St. Nicholas Building, Montreal.

Canadian Freight Association (Eastern lines), G. C. Ransom, Canadian Express Bldg., Montreal.

Canadian Freight Association (Western Lines), W. E. Campbell, 502 Canada Building, Winnipeg.

Canadian Railway Club, J. Powell, St. Lambert, Que. Meetings at Montreal 2nd Tuesday each month, 8.30 p.m., except June, July and August.

Canadian Society of Civil Engineers, C. H. McLeod, 413 Dorchester St. West, Montreal.

Canadian Street Railway Association, Acton Burrows, 70 Bond Street, Toronto.

Canadian Ticket Agents' Association, E. de la Hooke, London, Ont.

Central Railway and Engineering Club of Canada, C. L. Worth, 409 Union Station, Toronto. Meetings at Toronto 3rd Tuesday each month, except June, July and August.

Eastern Canadian Passenger Association, G. H. Webster, 54 Beaver Hall Hill, Montreal.

Engineers' Club of Montreal, R. W. H. Smith, 9 Beaver Hall Square, Montreal.

Engineers' Club of Toronto, R. B. Wolsey, 94 King St. West, Toronto.

Nova Scotia Society of Engineers, A. R. McCleave, Halifax, N.S.

Quebec Transportation Club, J. S. Blanchet, Quebec.

Western Canada Railway Club, W. H. Rosevear, 25½ Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month except June, July and August.

The Victoria Tug Co., Ltd., has been incorporated under the British Columbia Companies Act, with $56,229, and office at Victoria, to carry on a general steamship and passenger and freight business.

Transportation Conventions in 1912.

Oct.—American Railway Bridge and Building Association, Baltimore, Md.

Oct. 7-11.—Association of Transportation and Car Accounting Officers, Chicago, Ill.

Oct. 7-11.—American Electric Railway Association, Chicago, Ill.

Oct. 8-9.—Canadian Ticket Agents' Association, Ottawa, Ont.

Oct. 8-11.—Railway Signal Association, Quebec, Que.

Oct. 15-17.—American Railway Bridge and Building Association, Baltimore, Md.

Oct. 17-19.—American Association of Dining Car Superintendents, Denver, Col.

Oct. 23-25.—Society of Railway Financial Officers, Atlantic City, N.J.

Nov. 6-10.—Association of Railway Electrical Engineers, Chicago, Ill.

Nov. 15.—American Railway Association, Chicago, Ill.

Nov. 15-16.—American Association of Freight Traffic Officers, Chicago, Ill.

Nov. 19-21.—Maintenance of Way Master Painters' Association, Chicago, Ill.

Dec. 12-13.—Association of Transportation and Car Accounting Officers, Louisville, Ky.

The Merchant Service Guild of British Columbia has recommended to the Minister of Marine that the passage in the Seymour narrows, known as the Maude island channel, be closed, on account of the danger to navigation caused at certain stages of the tide by swirls extending out into the main channel. The channel is about one twelfth of a mile wide, and it is stated that the blocking could be carried out at small cost.

During July, four employes were killed, and six were injured in the course of their work in connection with the navigation of Canadian waters. Of the fatalities, two were due to drowning, and one each to a fall, and to being struck by machinery, while of the non-fatal accidents two each were due to machinery, and falls, and one each to an explosion of kerosene, and to falling material.

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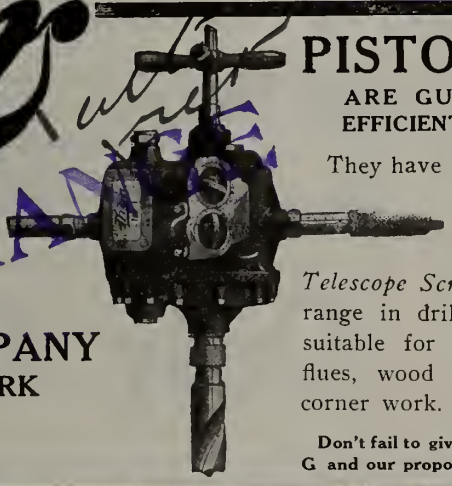

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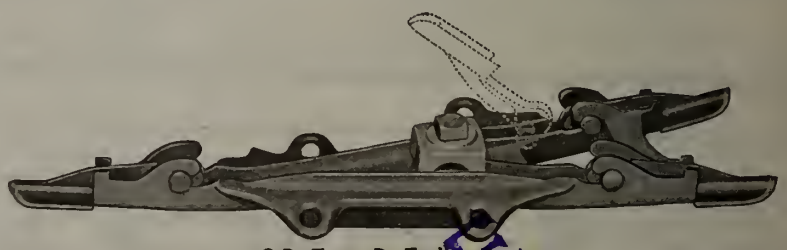

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Any person who is the sole head of a family, or any male over 18 years old, may homestead a quarter section of available Dominion land in Manitoba, Saskatchewan or Alberta. The applicant must appear in person at the Dominion Lands Agency or Sub-agency for the district. Entry by proxy may be made at any agency, on certain conditions by father, mother, son, daughter, brother or sister of intending homesteader.

Duties.—Six months' residence upon and cultivation of the land in each of three years. A homesteader may live within nine miles of his homestead on a farm of at least 80 acres solely owned and occupied by him or by his father, mother, son, daughter, brother or sister.

In certain districts a homesteader in good standing may pre-empt a quarter-section alongside his homestead. Price, $3.00 per acre.

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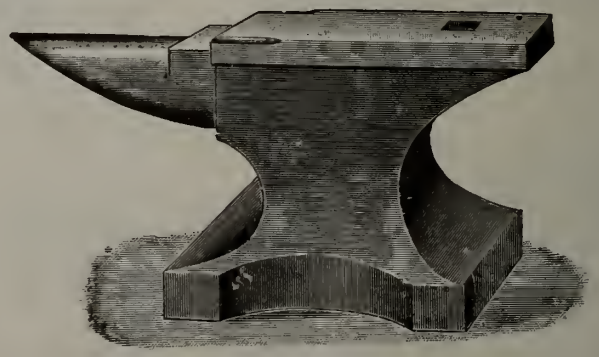

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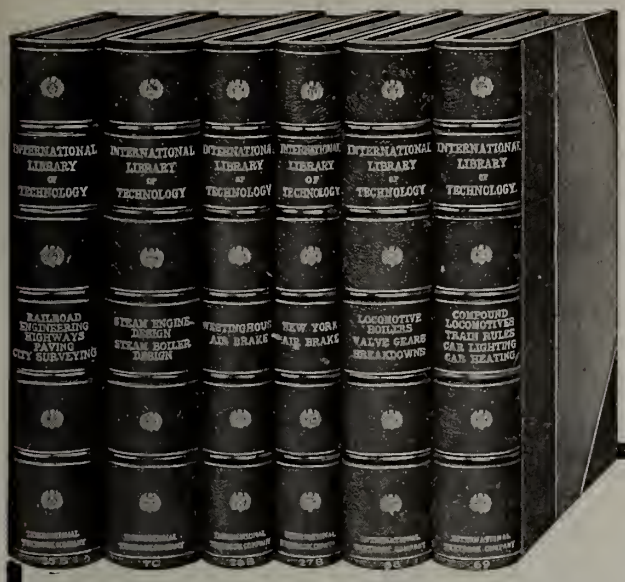

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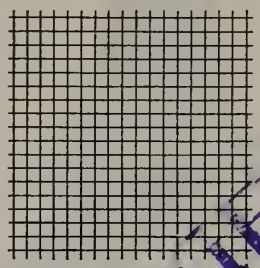

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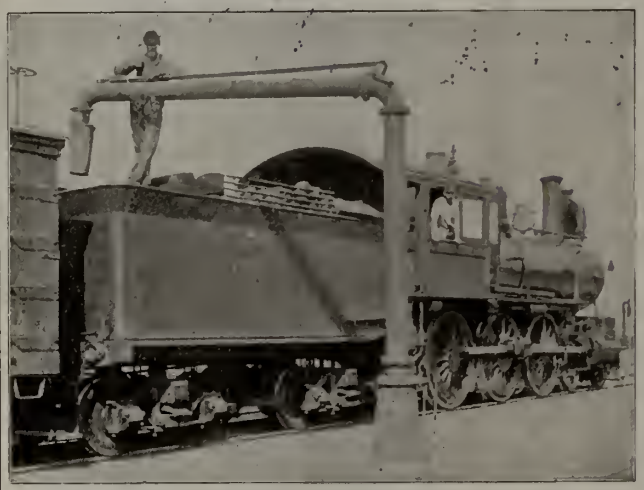

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Bolts and Nuts
Steel Co. of Canada, Ltd. ....Hamilton, Ont.
Bolts, Track
F. H. Hopkins & Co. .....Montreal
Nova Scotia Steel & Coal Co...New Glasgow
Steel Co. of Canada, Ltd. ....Hamilton, Ont.
Borers, Car Wheel
John Bertram & Sons Co. ....Dundas, Ont.
Canada Machinery Corporation ....Galt, Ont.
Brake Beams
Buffalo Brake Beam Co. ....Brantford, Ont.
Canadian Car & Foundry Co. .....Montreal
Chicago Railway Equipment Co. ....Chicago
Brake Shoes
Am. Brake Shoe & Fdry Co...Mahwah, N.J.
Canada Iron Corporation, Ltd. .....Montreal
Canadian Brakeshoe Co., Ltd. ....Sherbrooke
Canadian Brake Shoes, Ltd. .....Montreal
The Holden Co., Ltd. .....Montreal
Brake Shoes, Locomotive Driver
Canada Iron Corporation, Ltd. .....Montreal
Brass
C. H. Besly Co. .....Chicago, Ill.
James Robertson Co., Ltd. .....Montreal
Brass and Copper Cloth
B. Greening Wire Co., Ltd.....Hamilton, Ont.
Brasses, Car
T. McAvity & Sons .....St. John, N.B.
James Robertson Co., Ltd. .....Montreal
Bridge Numbers
Acton Burrows, Limited .....Toronto
Bridges
Canada Foundry Co., Ltd. .....Toronto
Canadian Bridge Co. .....Walkerville, Ont.
Dominion Bridge Co. .....Montreal
Bronze
American Vanadium Co. ....Pittsburgh, Pa.
Titanium Alloy Mfg. Co. .....Montreal
Buckets, Coal, Ore and Concrete
M. Beatty & Sons, Ltd. .....Welland, Ont.
Brown Hoisting Machinery Co. ...Cleveland
F. H. Hopkins & Co. .....Montreal
Buildings, Steel
Canada Foundry Co., Ltd. .....Toronto
Canadian Bridge Co. .....Walkerville, Ont.
Dominion Bridge Co. .....Montreal
Bumping Posts
Dominion Equipment & Supply Co...Winnipeg
The Holden Co., Ltd. .....Montreal
F. H. Hopkins & Co. .....Montreal
McCord & Co. .....Chicago, Ill.
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Canada Wire & Cable Co., Ltd. ....Toronto
Chapman & Walker, Ltd. .....Toronto
E. F. Phillips Electrical Works ...Montreal
Imperial Wire and Cable Co. .....Montreal
Standard Underground Cable Co. ...Hamilton
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Guilford S. Wood .....Chicago, Ill.
Car Movers
Dominion Equipment & Supply Co...Winnipeg
F. H. Hopkins & Co. .....Montreal
Mussens, Ltd. .....Montreal
Car Roofing
Franklin Railway Supply Co. ....New York
F. H. Hopkins & Co. .....Montreal
Cars
Crossen Car Co. .....Cobourg, Ont.
Canadian Car & Foundry Co. .....Montreal
Canadian Equipment Co., Ltd. .....Montreal
J. T. Gardner .....Chicago, Ill.
Hart-Otis Car Co., Ltd. .....Montreal
Preston Car & Coach Co., Ltd. .....Preston
Ross & McDonald .....Montreal
Car Signal Systems
Ohio Brass Co. .....Mansfield, Ohio
Castings
American Vanadium Co. ....Pittsburgh, Pa.
Canadian Car & Foundry Co. .....Montreal
Crossen Car Co. .....Cobourg, Ont.
James Robertson Co., Ltd. .....Montreal
Titanium Alloy Mfg. Co. .....Montreal
Castings, Brass
Canadian Bronze Co. .....Montreal
Canada Iron Corporation, Ltd. ....Montreal
Kerr Engine Co. .....Walkerville, Ont.
Tallman Brass & Metal Co. ...Hamilton, Ont.
Castings, Car
Am. Brake Shoe & Foundry Co...Mahwah, N.J.
Canada Iron Corporation, Ltd. ....Montreal
Castings, Iron
Allis-Chalmers-Bullock, Ltd. .....Montreal
Canada Iron Corporation, Ltd. .....Montreal
Hunt-Spiller Mfg. Corp. ..So. Boston, Mass.
Kerr Engine Co. .....Walkerville, Ont.
Castings, Iron and Steel
Am. Brake Shoe & Foundry Co...Mahwah, N.J.
Castings, Malleable
Galt Malleable Iron Co. .....Galt, Ont.
Pratt & Letchworth Co. .....Brantford, Ont.
Taylor & Arnold .....Montreal
Castings, Manganese Steel
Canadian Steel Foundries, Ltd. ....Montreal
Castings, Steel
American Vanadium Co. ....Pittsburgh, Pa.
Canada Iron Corporation, Ltd. .....Montreal
Canadian Steel Foundries, Ltd. ....Montreal
Joliette Steel & Iron Fy. Co...Joliette, Que.
W. Kennedy & Sons, Ltd...Owen Sound, Ont.
Pratt & Letchworth Co. .....Brantford, Ont.
Titanium Alloy Mfg. Co. .....Montreal
Catenary Materials
Ohio Brass Co. .....Mansfield, Ohio
Chains
B. J. Coghlin Co. .....Montreal
F. H. Hopkins & Co. .....Montreal
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Geo. C. Royce .....West Toronto, Ont.
Closets, Car
Duner Co. .....Chicago, Ill.
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Dominion Coal Co., Ltd. .....Montreal
Nova Scotia Steel & Coal Co...New Glasgow
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Allis-Chalmers-Bullock, Ltd. .....Montreal
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F. H. Hopkins & Co. .....Montreal
Mussens, Ltd. .....Montreal
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Canada Foundry Co., Ltd. .....Toronto
Dominion Equipment & Supply Co...Winnipeg
F. H. Hopkins & Co. .....Montreal
Mussens, Ltd. .....Montreal
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Consolidated Car Heating Co.....Albany, N.Y.
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Cranes, Electric
Babcock & Wilcox, Ltd. .....Montreal
Dominion Bridge Co. .....Montreal
F. H. Hopkins & Co. .....Montreal
Mussens, Ltd. .....Montreal
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American Vanadium Co. ....Pittsburgh, Pa.
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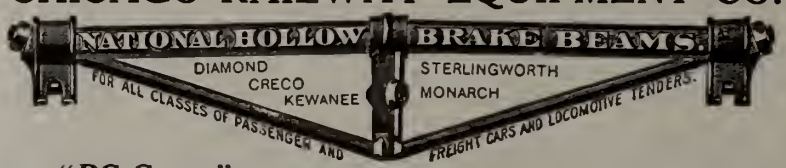

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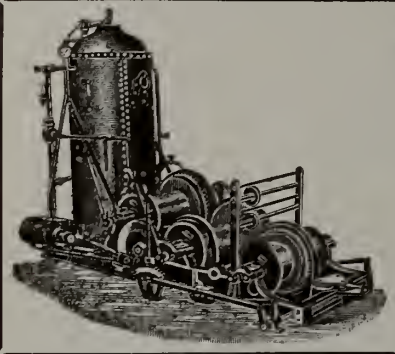

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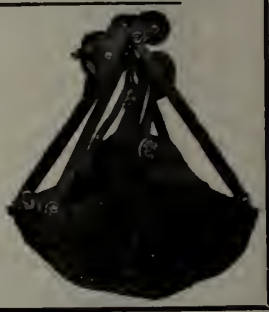

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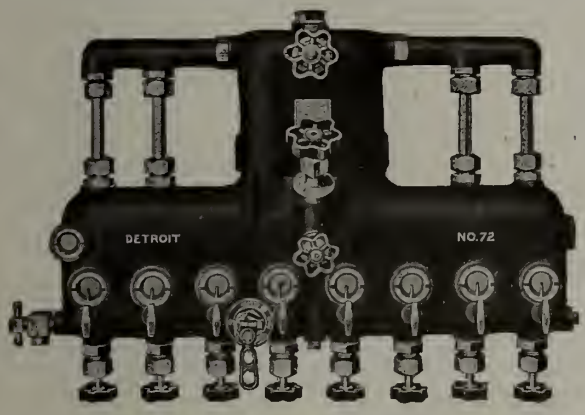

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ESTABLISHED 1898.

NUMBER 177 — TORONTO, CANADA, NOVEMBER, 1912. — Subscription Rates Page 561

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Canned Lightning for quick and easy stripping of varnished or painted surfaces. Harmless to wood or health.

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For Steel and Wood Cars

Write for Booklet.

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WESTINGHOUSE AMM Automatic Brakes have every quality necessary to the best service on modern high-speed urban, suburban and interurban traction lines. They are designed for train service of not exceeding five cars, yet, by a straight-air feature that may be provided, single cars are operated with all the flexibility of straight air, the automatic safety features being always in reserve.

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There is a Westinghouse Brake designed for every service; state your proposition to our nearest office. They will advise you, after analyzing your operating conditions.

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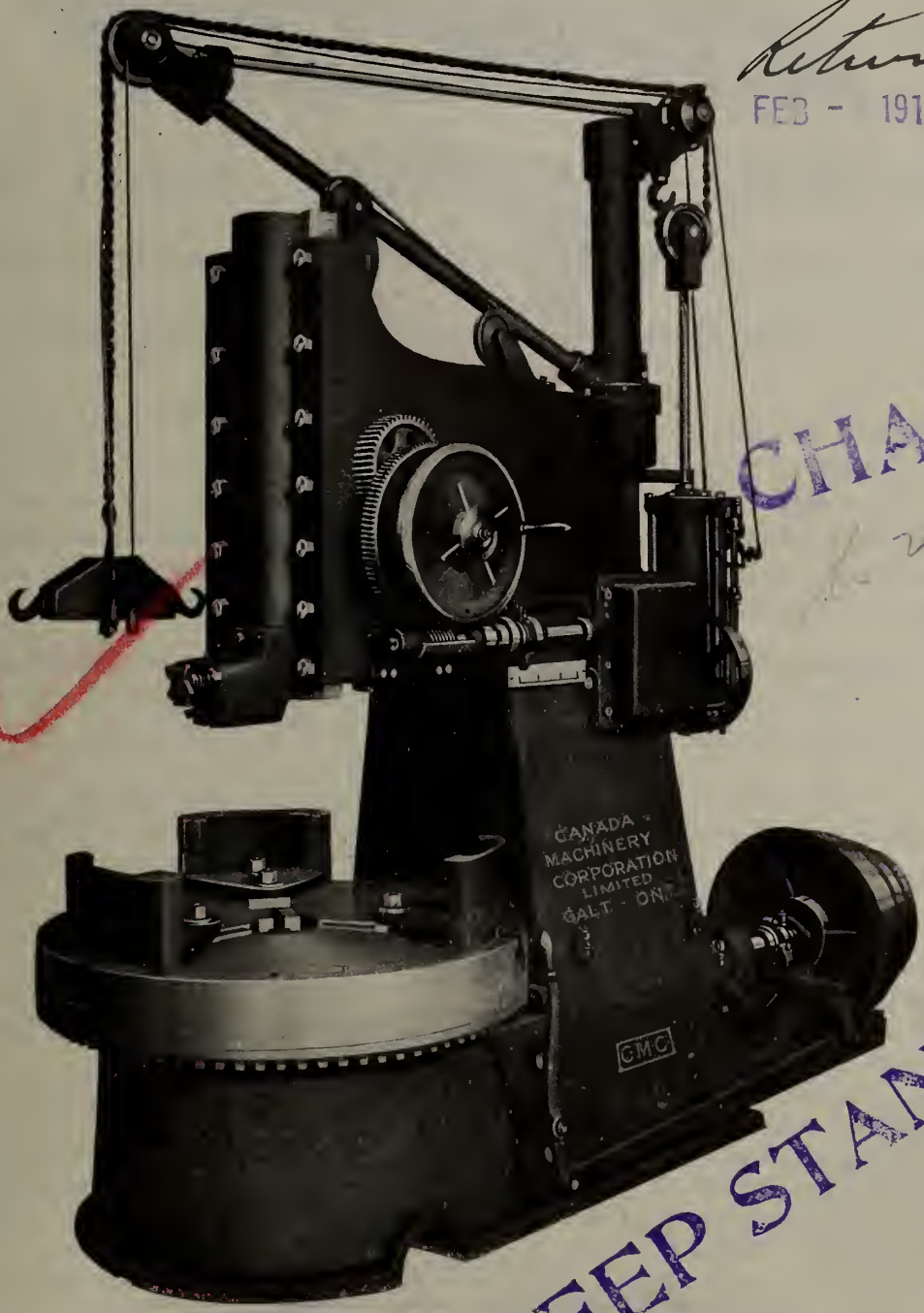

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Write at once for our booklet on "SCIENTIFIC LUBRICATION." You will be interested in striving to cut down your lubrication expenses.

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Among them are numbered some of the world's leading chemists and metallurgists and men who specify Titanium Alloy, because it pays in dollars and cents. Their opinions are well worth your careful reading.

"The combination of Titanium with nitrogen is attended with the evolution of heat. It is the **only** indisputable example of the combustion of an element in nitrogen."
—Moissan,
Celebrated French Chemist.

"Titanium introduced as an alloy at once combines with the gaseous nitrogen present in the molten metal, forming a stable nitride. It is the formation of this stable nitride which prevents blowholes and thereby produces solid ingots, or castings."
—Dr. F. C. Weber.

"The reducing agents last added to the bath, carbon, manganese and silicon, destroy to a certain extent the existing over-oxidation, but they are able to remove the final traces unsatisfactorily and with the greatest difficulty. This service must therefore be performed by a very powerful reducing agent, such as Titanium, which should be regarded as one of the best and most available." —E. von Maltitz,
Formerly with Illinois Steel Co.

"A hard steel with one per cent. carbon becomes fragile and useless when it contains 0.03 per cent. nitrogen, even when not tempered, and when tempered it will show numerous 'shakes' even when nitrogen is as low as 0.0116." —Dr. Hjalmar Braune.

"Titanium has one advantage which has caused its use to be recommended, namely, its high affinity for nitrogen."
—Bradley Stoughton,
Author "Metallurgy of Iron and Steel."

"Titanium * * * has a stronger affinity for oxygen than have the other well-known deoxidizers; * * * it probably gives the slag such a consistency that it separates more completely from the molten iron."
—Prof. Henry M. Howe,
Author "Metallurgy of Steel."

"The treatment of all steels with ferro-titanium for the purpose of the purification of the metal is strongly recommended. The presence of nitrogen to the extent of .02 or .045 or .035 in certain steels being enough to cause the metal to break asunder, destroying all elongation and reduction of area." —H. Le Chatellier,
Prof. of Metallurgy, University of France.

For further proof of Titanium Alloy's efficiency, note its success in making steel rails that are the wonder of the railway world—rails that have proved in every test superior to plain Bessemer and open-hearth. It was Titanium Alloy that made the high-carbon rail possible.

You can get Titanium steel at any good mill or foundry at an extra cost ranging from 50c to about $2 per gross ton. Titanium iron costs, extra, 25c and upwards per gross ton. When you order specify that our men shall look after the Titanium addition, so as to insure highest quality metal.

Output of Titanium steel in 1910 *was* 326,300 *gross tons. In* 1911 *the output increased to* 410,600 *gross tons.*

"We have lately been using Titanium in all of our castings and are getting results very much superior to those when this alloy is not used, particularly so in certain small pipe fittings and castings of this character which are subject to high pressure, and where the denseness of the metal is an important factor." —Keystone Steel Casting Co.
Chester, Pa.

"The action of Titanium is to increase the strength of the mixture and to facilitate the throwing off of the impurities contained, and also to give a tougher and more durable chill." —New York Car Wheel Co.,
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"We have just received reports from a test bar, having seven pounds of ferro-titanium to the ton, which pulled 90,000 pounds to the square inch with 28 per cent. elongation. The carbon in this steel was only .19. The castings in this heat were subject to specifications which called for tensile strength not less than 60,000 and not more than 70,000 pounds."
—Strong Steel Foundry Co.,
Buffalo, N.Y.

"Have treated during the past two years in the neighborhood of 3,000 tons of steel rails with small percentages of ferro-titanium proportioned to, and with the result of eliminating, the 0.25 to 0.35 per cent. oxide of iron and slag which has been found in such rails prior to such treatment; also the included gases and also slags, the resulting products being practically free from all impurities." —A Prominent Steel Maker.

Tests made by Professor M. Hokanson at the Carnegie Technical Schools demonstrate that the crushing strength of chilled iron is increased nearly 100% by the use of Titanium Alloy.

In summation: Every claim made for Titanium Alloy has been proved in service, and is based upon the careful researches of Enrique Touceda, C. E., Rensselaer Polytechnic Institute; Charles McKenna, eminent metallurgist; E. von Maltitz, for five years with Illinois Steel Co.; Prof. Bradley Stoughton, late of Columbia University; Prof. John J. Porter, of the University of Cincinnati; Prof. Henry M. Howe, Author of "Metallurgy of Iron and Steel"; H. Le Chatellier, Prof. of Metallurgy, University of France; Auguste J. Rossi, M. E., C. E.—and many others.

Ask for Booklet No. 30 and we will send literature explaining in detail the action of Titanium Alloy and how it can be used to your advantage. If you are particularly interested in rails, ask for rail diagrams showing superiority of Titanium Rails over plain open-hearth or Bessemer rails.

Titanium Alloy is made for Canadian Consumption by Electro Metals, Welland Ont.

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NOV 12 1912

The Gas Electric Car

Electricity is the silent and efficient transmission link, furnishing, power and brilliant illumination.

Is materially reducing operating costs and increasing traffic on brancn railway lines wherever used.

The records of thousands of miles of operation in actual service prove the usefulness and reliability of this car.

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Strong, reliable, efficient and attractive. M. C. B. throughout. Just as the trolley car successfully displaced the horse car, so with equal success and profit the C. G. E. Gas Car is now replacing branch line trains.

Catalogue 4855 illustrates and describes the equipment and shows many car body designs. This will be sent you by return mail for the asking.

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Railroad Track Equipment
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Switching Locomotive, built for Intercolonial Railway of Canada

Total weight of engine in working order	144,000 pounds
Weight on drivers	144,000 pounds
Diameter of drivers	51 inches
Boiler pressure	200 pounds
Cylinders	20 x 26 inches
Maximum tractive power	34,500 pounds

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Total weight of engine in working order	221,800 pounds
Weight on driving wheels	192,600 pounds
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Boiler pressure	180 pounds
Cylinders	23½ x 32 inches
Superheater	Vaughan-Horsey
Maximum tractive power	43,000 pounds

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MAINTENANCE OF WAY

FULL STOCK OF

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RAIL CARS

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OF ALL KINDS

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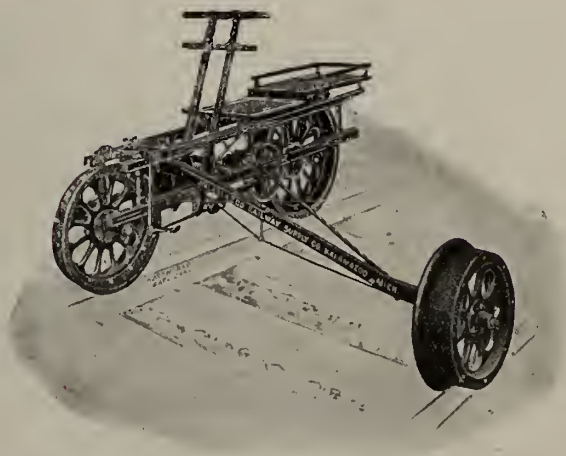

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CANADIAN NORTHERN RAILWAY

Total weight of engine, 154,000 pounds.
Weight on drivers, 112,500 pounds.
Diameter of drivers, 57 inches.
Boiler pressure, 170 pounds.
Cylinders, 20 x 24 inches.
Maximum tractive power, 24,300 pounds.

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CAB SIGNALS

are the logical development of the proven requirements for certainty in the observation of signals. Their value will be readily recognized and warmly endorsed by any railway official who will fully study the application of Cab Signals as an auxiliary to present signaling practice and apparatus. As employed in the

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Railway Signaling

Cab Signals have proven their efficiency on a Canadian road where the Simmen System has been in regular and successful operation for over three years.

After a thorough service test on eighteen miles of the Indianapolis and Cincinnati interurban lines, one of the fastest lines in the Middle West, the Simmen System has been ordered installed on 82 miles more of the same road, with the approval of the State Railroad Commission.

With ample resources to insure complete responsibility, the NORTHEY-PLUMMER Company, Limited, is prepared to demonstrate the SIMMEN SYSTEM on any railroad.

Without obligation upon any inquirer, we solicit the opportunity to present the evidence of SIMMEN SYSTEM efficiency and reliability under any operating conditions. Literature furnished upon request.

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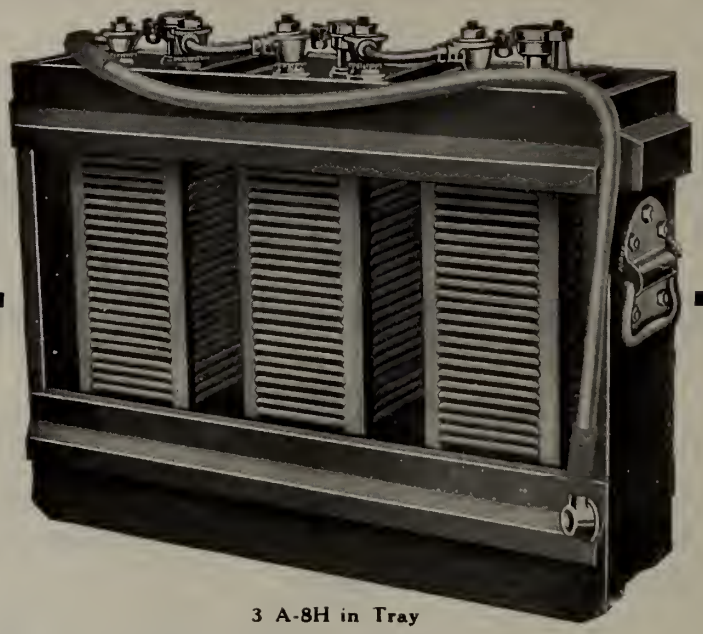

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The construction of the Edison Cell (consisting of element, electrolyte and container) constitutes a wholly new departure in storage battery practice, which immensely increases the range of usefulness in railway work.

In Railway Work Reliability is Essential

Where the strait storage, the axle generator, or the head-end generator system is used, reliability of the storage battery is the vital point. Why fuss with lighting equipment requiring constant expert attention to keep going and heavy to handle and to haul, when the storage battery of to-day is the care-free, long lived Edison Battery?

The Edison Battery saves one ton in weight per car on 32 volt lighting equipment. Its trays weigh only 100 lbs. and can be handled easily by one man. Its care and operation is as simple as A-B-C. It can be charged when convenient, and will stand discharged indefinitely without injury. It is totally free from "sulphation," or any sort of corrosion, making the storage battery the most dependable, instead of the most unreliable part of the train lighting system.

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Direct connection for St. John, N.B., The Sydneys, Prince Edward Island, Newfoundland (except by Ocean Limited, leaving Montreal Saturday).

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YOU Will enjoy reading the Descriptive Booklets of the Canadian Government Railways, Intercolonial Railway, Prince Edward Island Railway.

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The Nova Scotia capital in the good old days, when warfare raged and prize money flowed like water.

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The summer beauties of Prince Edward Island. A part of Canada no tourist can afford to miss.

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Construction Equipment of all Descriptions for RAILROAD BUILDING

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All capacities from 5-8 cubic yard to 6 cubic yard dippers. Built of the very best materials—Standard and Revolving Types.

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These cars are built with Pressed Steel Channel Arch-Brace Underframes, which bind the trucks firmly together, also form the supports for the car bed in dumping. We want you to investigate these cars. It will pay you.

"Davenport" Locomotives

We can supply Locomotives in all sizes for any practical gauge. Let us send you catalogues.

Steel Rails, Wheel and Drag Scrapers, Plows, Track Tools, Hoisting Engines, Concrete Mixers, Rock Crushers, Derricks, Wire Rope, Etc., Etc.

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Specialists in the Correction of Commutator and Brush Troubles

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The introduction of this improved shoe has revolutionized the Brake Shoe market of Canada. A new and definite basis of purchase has supplanted the old uncertain methods.

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NOW the plain cast iron shoe has been discarded, and the choice lies between the old steel back shoe and the new improved steel reinforced shoe shown above.

THEN there was only one method of reinforcement.

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The Double Steel Reinforced Brake Shoe, made plain or flanged for passenger and freight service, also for locomotives, tenders and electric equipment.

Made only by

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Canadian Northern Ontario Railway

Toronto - Ottawa Line

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With connection at Trenton for all Points on the Central Ontario Railway, and at Napanee for Bay of Quinte Railway Points.

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Nov. 13	Royal George	Nov. 27
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Nov. 27	x Royal Edward	
Dec. 11	x Royal George	Friday, Dec. 27

x Christmas Sailings. z Withdrawn for Annual Inspection.

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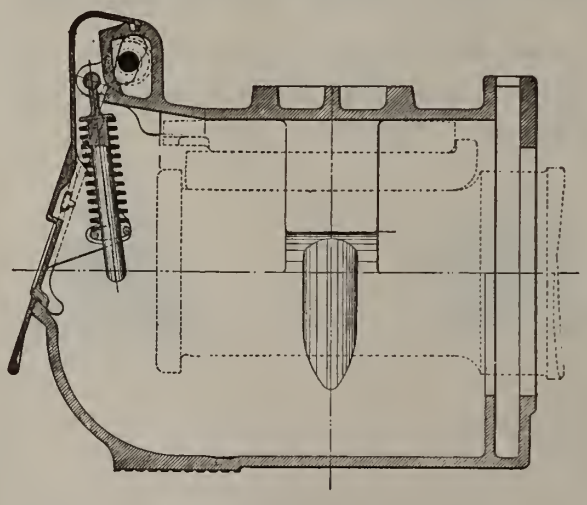

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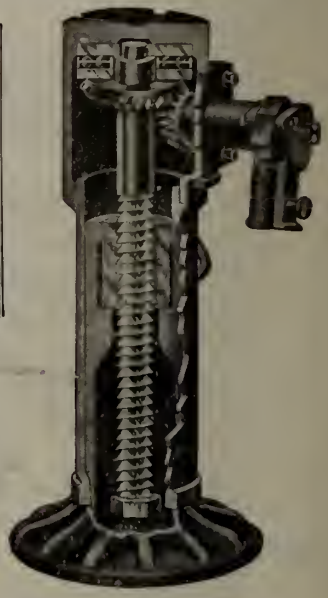

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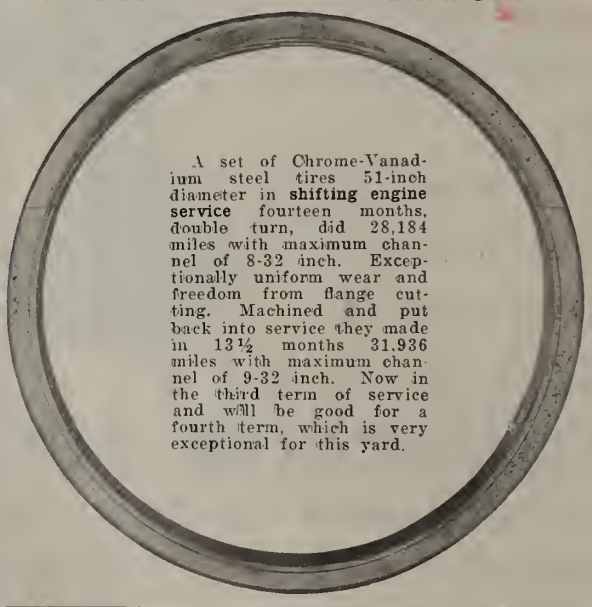

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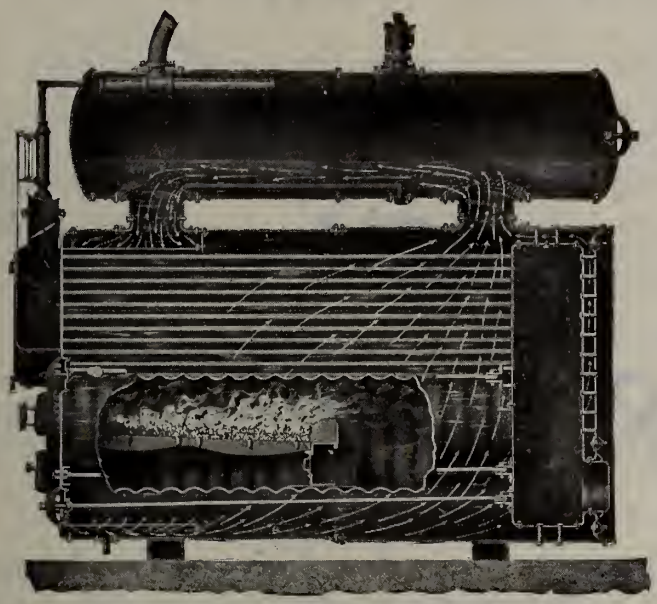

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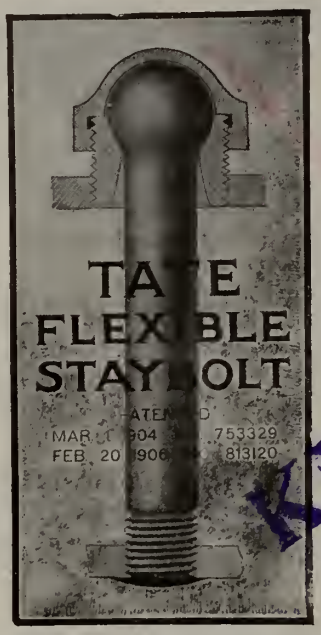

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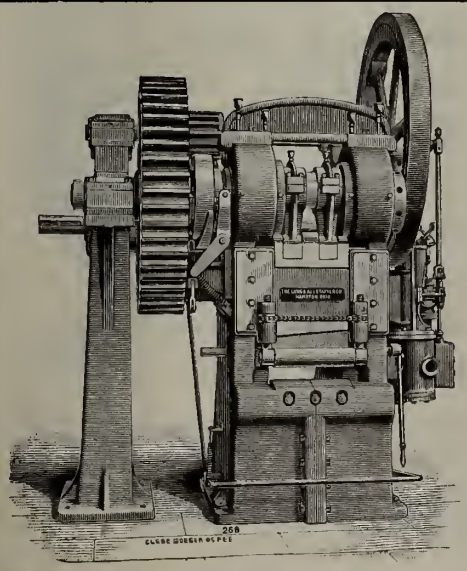

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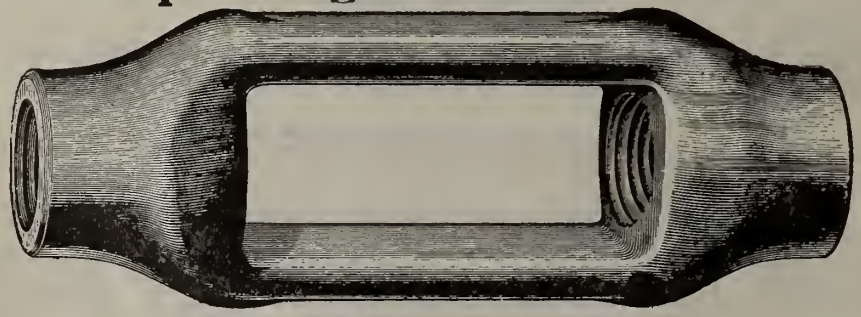

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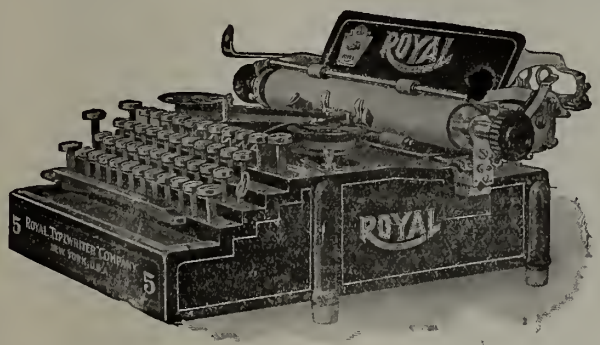

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November, 1912.

Safety Organization on the Michigan Central Railroad.

From carefully compiled records on all the units of the New York Central Lines, of which the Michigan Central Rd., with its Canada Southern division, is a part, it has been observed that of all the preventable accidents, the majority have not been due to defective conditions, defective equipment or improper methods of operation, but to that hard to control factor, the "human element." These records are kept every month, with the cause and nature of each accident, serving as complete data from which to make the deductions. With these rather alarming conditions before the management, a campaign of education was planned among the employes, to force home their responsibility in the matter, and the degree to which they can assist in the matter of reducing the preventable accidents by a proper co-operation on the part of all concerned.

With this in view, an organization was formed under the charge of Geo. Bradshaw, who was given the title of General Safety Agent, with offices in both New York and Chicago. Prior to this appointment, he had been engaged for about 10 years in the investigation and settlement of claims for personal injuries and death resulting from railway accidents. This placed him closely in touch with conditions as they existed, with a good working basis on which to evolve the safety organizations which are at present in successful operation. Covering this long term of experience, in touch with all sorts of conditions where accidents—preventable and otherwise—were observed, Mr. Bradshaw wrote a book called, "Prevention of Railroad Accidents," in which the more important of his observations are outlined. This book, as a basis for the employes to ground their plans for careful actions in future, has been distributed over all the New York Central Lines, to the number of 60,000. In addition to this, the subject is being kept alive by the periodical distribution of safety literature. This has resulted in the employes taking a personal interest in the subject, with an increased desire on their part to further the cause of safety.

In this book which has been so freely distributed over the lines, there are some very forceful arguments supporting the contentions that a large portion of the preventable accidents are due to carelessness on the part of the human element involved. Stress is laid on the use of an ounce of prevention, instead of a pound of cure in the form of monetary compensation for damages received. This sort of compensation can never make amends to widows and orphans, for example, for the loss of husband or father. The book, being addressed to employes, is confined exclusively to those phases of the subject on which they are able to direct their energies in support of the movement.

On one of the initial fly leaves of the book, there is a very trite remark, an abstract from a paragraph contained in the book, which ought to carry great weight with those for whom the work is intended. It is as follows:—"Injure an experienced man, a new man must take his place. A new man is always an experiment. The new man to whom you extend the hand of fellowship today, may run a car over you tomorrow." This emphasizes to the employe the fact that even if he be not the victim, his chances of safety are decreased by the presence of indifferent employes about him. For this reason it should be the constant aim of every one to be ever on the alert to point out practices that are dangerous, and suggest alternative ones that eliminate the trouble.

Tables in the book, from statistics compiled by the U.S. Interstate Commerce Commission, show that injuries to employes are constantly on the increase. Whereas

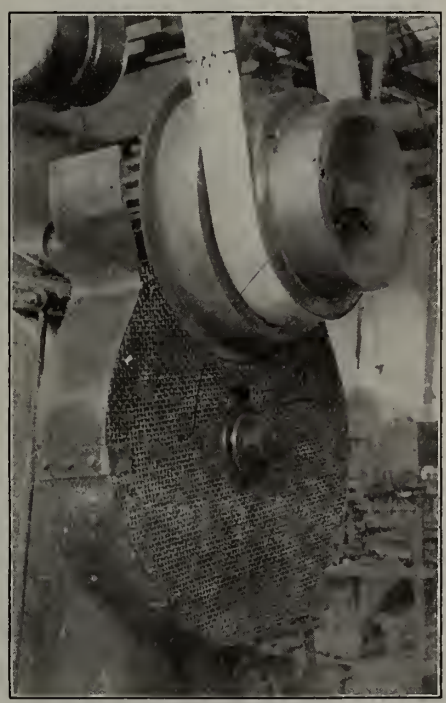


Fig. 1.—Gear Protection on a Slotter.

in 1890, only one out of every 33 employes was in any way injured, in 1911 the ratio had increased to one in every 13. Truly a remarkable subject for thought. The number of accidents resulting in death has not increased to the same degree, but there is still a marked increase. All this has occurred despite the volumes of legislation passed by nearly every Parliament and Legislature in both Canada and the United States. Numerous means of making the lot of the railway employe safer in every way have been introduced as a result of this legislation, so that a great many systems have most of the approved safety devices and other kindred appliances. Over 99% of all trains are equipped with air brakes, reducing the necessity of trainmen traversing the top of the train, and about the same proportion have automatic couplers, making going between the cars unnecessary. Yet with these two greatest death traps removed, the accident record has been growing at an alarming rate.

The only conclusion that can possibly be derived from these records, is that the human element must be at fault. Nobody can say that the present day employe is less intelligent than his predecessor, for such is decidedly not the case with modern high specialization in the particular branch in which the employe is engaged, and the increased opportunities for attaining a higher degree of knowledge concerning the work in hand. This leaves the deduction that the workmen are becoming more careless with their work, and that it is in this direction that those concerned in the reduction of the accident record must look if conditions are not to continue becoming worse and worse as time goes on. Conservation is the present day motto, and the conservation of human life the highest attainment in that programme.

In Mr. Bradshaw's book, instances of everyday carelessness without number are cited from his own observation, the disastrous results occurring being in each case added. Among the incidents cited, a few will be here mentioned: The passing of a danger signal by a fast train because the signal was almost invariably with the engineer and not against; carelessness and a feeling of security prevented the engineer observing the signal. The neglect of car repairers to place warning signs at the ends of cars under which they were working; result, car bumped by yard engine, and workmen injured. Watchmen on car ferry failed to examine ports from a feeling similar to that of the engineer above; sea on the open port window side caused the boat to fill to the extent that saving was impossible, the boat sinking and crew perishing.

A long series of illustrations are given in the book to illustrate the commoner causes of accidents, and the reasons why they occur. These include the careless loading of baggage on trucks, placing baggage in car aisles, unblocked frogs, switches and guard rails; jacking up a track with the jack on the inside; using a hammer on the end of a tempered chisel; not paying attention to work around wood machinery; kicking drawbar jaw as cars are about to couple; opening elevator doors before elevator stops; standing on top of tender between coal chute and cab where the fireman would be caught if the locomotive backed up; hitting a tempered tool in a lathe with a hammer; standing between tracks to jump on the front footboard of a locomotive instead of to one side of track; leaving loose material lying around a freight yard where trainmen might trip and fall under the wheels; defective electrical insulation; sitting on brake wheel, loose baggage and trucks on station platform; where there are two trainmen one should observe each end in switching around; neglecting to flag back when train is stopped. These are but a few of the more common of the many instances cited and illustrated in this book, giving the employes for whom it is primarily intended an idea of the grossness of the careless methods of which they are guilty. In the majority of cases, it is more from lack of perception of the dangers in-

volves that the trouble occurs, and if this condition can be altered, good results will undoubtedly follow. It is a remarkable fact, too, that the majority of the injuries occur to the parties responsible for the carelessness, so that a change in the viewpoint will show that this safety campaign affects each man directly.

Another very prolific cause of accident is the tendency of people to use the railway line as a highway. F. V. Whiting, General Claims Attorney, New York Central Lines, in a recent pamphlet entitled, "Trespassers Killed on Railways—Who are They?" states from observations that cannot be disputed, that contrary to the commonly accepted belief that the majority of people killed or injured while trespassing on railway property are tramps or hoboes, the greater number are of a class of citizen of value to the community. They are largely artisans and business men, using the right of way for a short cut. For this, legislation would remove a great deal of the trouble, but in view of the laxity and impossibility of enforcing such legislation effectively, it has been suggested that all railway employes co-operate to the fullest extent in not only not walking on the right of way themselves, but in influencing others not to do so.

Complete organizations have been introduced on all lines of the systems. For each of the systems, lines east and lines west of Buffalo, the latter including the Michigan Central Rd., there is what is called a general safety committee, comprising on the lines east, the following permanent members:—(1) general manager (chairman), (2) assistant general managers, (3) general superintendents, (4) chief engineer, (5) engineer maintenance of way, (6) superintendent of motive power, (7) superintendent of rolling stock, (8) general claims attorney, (9) signal engineer, (10) chief mechanical engineer, (11) general safety agent, secretary. The General Safety Agent, with offices in both New York and Chicago, is secretary of both general committees.

On the lines west, the organization is slightly different from that on the lines east. On each line or group of lines under one management, there is a central safety committee, inferior to the above general committee. This central committee is composed of the general officers of the lines under the one management, as for example, the Michigan Central Rd. has a central safety committee at Detroit as well as the general safety committee at Chicago, to which it reports. On the lines west, the general safety committee consists of the assistant vice president, the general managers or other operating officials of the various roads, the general claims attorney and the general safety agent.

On each division, there are two other committees—maybe more, depending on the extent, but always two—called the division safety committee and the shop safety committee. If more than one important shop exists, there is a committee for each. On the Canada Southern division, there is a division safety committee for the whole division, and a shop safety committee located in the shops at St. Thomas. The organization of the division safety committee is as follows:—(1) division superintendent, chairman; (2) master mechanic, (3) division claim agent, (4) division engineer, (5) a road engineer, (6) a road fireman, (7) a trainman, (8) a conductor, (9) a station agent, or station employe; (10) a supervisor of bridges or buildings, (11) a signal supervisor, or signal man; (12) a track supervisor, (13) a yardmaster, (14) such other employes or sub-committees as the local conditions may indicate, to be appointed directly by the Division Superintendent. The first four of these members are permanent, and the remainder are appointed for six months, the chairman having the appointment of new members at the expiration of that period. The chairman's chief clerk is secretary of the committee, which is called at the discretion of the chairman.

Fig. 2.—Gear Protection on Punch Press.

The organization of the shop committee is as follows:—(1) master mechanic, chairman; (2) foreman, motive power shops; (3) foreman, car shops; (4) superintendent of tools and machinery, (5) a machinist, (6) a boilermaker, (7) a blacksmith, (8) a car repairman, (9) a painter, (10) such other employes or sub-committees as the local conditions may indicate, to be appointed direct by the master mechanic. The first four of these are permanent, with the balance appointed every six months by the master mechanic, the chief clerk of the latter being the secretary of the committee, which is called at the discretion of the master mechanic.

In the different committees, each member is supplied with a small note book marked, "Member of Safety Committee, for Safety Notes Only," in which it is his duty to jot down from time to time as it comes under his observation, any practices or conditions that can be improved. The instructions on the first two pages of the book explain their purport thoroughly. They are as follows:—

"This book is entrusted to you as a member of the local safety committee to be used as a memorandum book for matters pertaining to safety according to the following instructions:—

"1. Carry this book with you at all times while on duty, and when your term expires deliver it to your successor.

"2. Be on the alert to discover unsafe conditions or practices. When you observe, or anyone reports to you, any condition of way, track, structures, equipment, tools or appliances, or any method of practice, which in your opinion, or the opinion of the one making the report to you, is unsafe and which can reasonably be made safe, make at once accurate and complete memoranda of the particular condition or method observed or reported and also of what you, or the one making the report, may think should be done. Report such conditions or practices as soon as discovered to the proper person for correction, and make full report to the committee.

"3. Give proper attention to every matter called to your attention. When practicable, always make a careful investigation yourself of all matters reported to you. However honest may be the man who makes a report to you, there is always the possibility he may be mistaken or he may be reporting to you as facts matters which are 'hearsay' with him. Better see and investigate for yourself. Remember the local committee, when it meets, wants indisputable facts as to what exists, and sound, practicable opinions as to what should be done concerning any given statement of facts. As a member of the com-

Fig. 3.—Protection to Star Feeder on Rip Saw.

Fig. 4.—Protection to Planer Gearing.

mittee, your statements will be given extra weight and credit. So it is a duty you owe to the committee, to yourself, to other members of the committee, to procure and report accurately and completely the facts.

"4. So far as consistent with other duties, investigate cases of injury and damage to property to determine what may be done to avoid a recurrence from similar causes.

"5. Before making any recommendation which has originated with you or been suggested to you, think the matter over carefully. Determine first, whether your recommendation, if adopted, will make conditions safer, and secondly, whether its adoption is reasonable and practicable.

"6. If you see employes violating rules or instructions or taking unnecessary chances in their work, it is your right and

Fig. 5.—Band Saw Protection.

duty to warn them of the serious consequences which may follow such practices, to explain to them, if necessary, the proper and safe way, and to urge them to comply with rules and instructions and do their work in the safest way. To discharge this duty effectively requires tact and diplomacy, which, if you do not already possess, you can and should acquire by cultivation for your own personal benefit as well as for the advancement of the cause of safety.

"If you, in fact, feel a real unselfish interest in the safety of your fellow employes, you can, by the exercise of patience and good judgment, call attention to their shortcomings and secure their correction, and at the same time make friends for yourself and the cause of safety. You can do a great deal of good by a conscientious and proper performance of your duty in this respect."

The above clearly outlines the duties of the members comprising the committees. Each one, in his particular occupation, is to be ever on the alert for improved conditions of safety. To make the reports more thorough, the mechanics from the major portion of the local committees, for the reason that they are, in the course of their regular work, more in touch with the details of the conditions as they exist, whereas the higher men, at the best, can do no more than know the bigger problems, the smaller things being left to these juniors.

Each of these committees meets at the discretion of the chairman, and on these occasions the note books are called into service, the observations of the different members being discussed thoroughly on all sides, and definite action taken thereon. The smaller and purely local matters are acted upon at these meetings, but the larger questions that would concern other divisions of the system are referred by either of the local committees making the observation, to the central committee, which in turn, if the matter is of sufficient importance to warrant it, refers it to the general safety committee for final action. Thus the smaller things are settled locally, and the more important questions passed along for the benefit of others. These reports from the local committees are made not later than the tenth of the month following that in which the meeting was held.

Throughout this article, there are illustrations of the manner in which the shop committee at St. Thomas, Ont., has improved its opportunities by the protection of machinery. All these improvements have been made within the last few months, as it was only in June that the safety organization movement took definite form, the first meetings of the local committees at St. Thomas being held in July. The locomotive and car departments have set up a healthy rivalry in the matter of protecting machinery, resulting in a very good showing in the short time it has been used.

Fig. 1 shows a simple gear guard on the rear of a slotter in the locomotive department, made of sheet metal and smokebox netting. In the same department is a typical gear protection on a punch press as in fig. 2. Fig. 3 is a sheet metal rip saw feeder star protection in the car department. Fig. 4 is a planer gear protecting railing around the pit containing the operating gearing; it is made completely from piping. Figs 5 and 6 are of wood machinery in the car department. The band saw is completely enclosed with swing doors. The construction prevents all possibility of the saw flying out and injuring the operator or bystander, and has that added advantage that the chilling breeze set up around the operator's feet by the rapidly moving saw is removed, a comfort in winter. The wood drill case is also simply made of sheet metal, with a hinged front door for oiling and examination of the

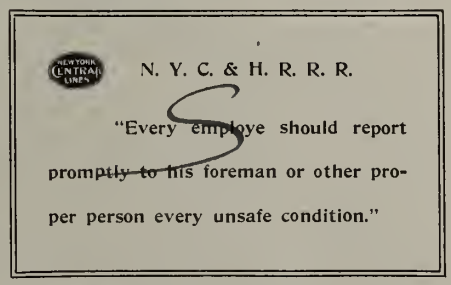


Fig. 7.—Typical Warning Placard.

working parts. The drill spindle to the left is also protected by having a collar shrunk on over the setscrew, making the head of the latter flush with the surface, and not dangerous to the loose ends of the operator's clothes.

In conjunction with this campaign for safety, the shops and other public places are having small placards posted at convenient points, printed with appropriate and trite remarks. These cards are of different colors, the one shown in fig. 7 being typical of the others. They are 6 x 9 ins., and there are five in the set. The one illustrated contains the following remark:—"Every employe should report promptly to his foreman or other proper person every unsafe condition." The other cards are as follows:—"The more you insist upon carefulness on the part of others as well as exercising it yourself, the safer it will be for all." "The practice of getting on and off moving cars and engines results in injury and death to many employes. Those whose duties require such practice should exercise all possible care. Other employes must not jump on or off moving cars or engines." "Safety should be the first consideration of all employes. In all cases of doubt take the safe course." "Let every employe of the New York Central begin the new year with a firm resolution to do everything in his power to avoid injury to himself or others. This resolution, made and kept, will mean greater safety to employes for 1912." This latter

Fig. 6.—Wood Drill Protection.

card was posted in some shops of the New York Central Lines where the "safety first" movement was introduced earlier.

Other typewritten notices are posted on the shop notice board for that end of the safety propaganda. The first one is the following, and is taken from Mr. Bradshaw's book:—

"MEMORY GEMS FOR SHOP MEN.

"Don't wear loose, baggy, clothing where it is liable to be caught in machinery.

"Avoid walking on railroad tracks, and before crossing any track, 'Stop, look, and listen.'

"Be sure you replace all guards when through repairing machinery. Think about the other fellow.

"It is your duty, as well as your protection, to report unsafe condition to your foreman or superintendent.

"Stop machine before oiling, wiping or repairing it, and don't try to operate a machine you do not understand.

"Don't swing sledge or hammer that you know is working loose on handle, thinking it won't come off till 'next time.' You may not be hurt, but what about the 'other fellow.'

"Don't expect your helper to be as good a mechanic as you are. He isn't or he wouldn't be a helper. A little explanation as to the way the work is to be done may save injury to one or both of you.

"If you know of some machine not properly guarded, don't wait till some one gets hurt and say, 'I told you so.' Tell the

man in charge of the shop, before an accident happens, and ask him to supply proper guard.

"Avoid jumping upon moving cars or engines. Your work does not require it and you cannot afford to take the risk.

"Never strike tempered steel with hammer or other metal object. Many eyes are injured and destroyed from this cause every year."

In addition to the above which are posted in the shops, there are corresponding "memory gems" for the other branches of railroading, each emphasizing the special risks which that class is liable to, with cautionary remarks thereon.

"The "safety first" movement has been in use such a short time on the Michigan Central Rd. that no definite conclusion as to the efficacy of the scheme can as yet have been deduced, but indications point to its success if carefully followed out. It will be interesting to observe the extent to which the accidents will be reduced, as reflected in the accident reports compiled by the company in future.

The Grand Trunk Railway Palmer-Providence Line in New England.

By H. Cole Estep, Engineer of Construction.

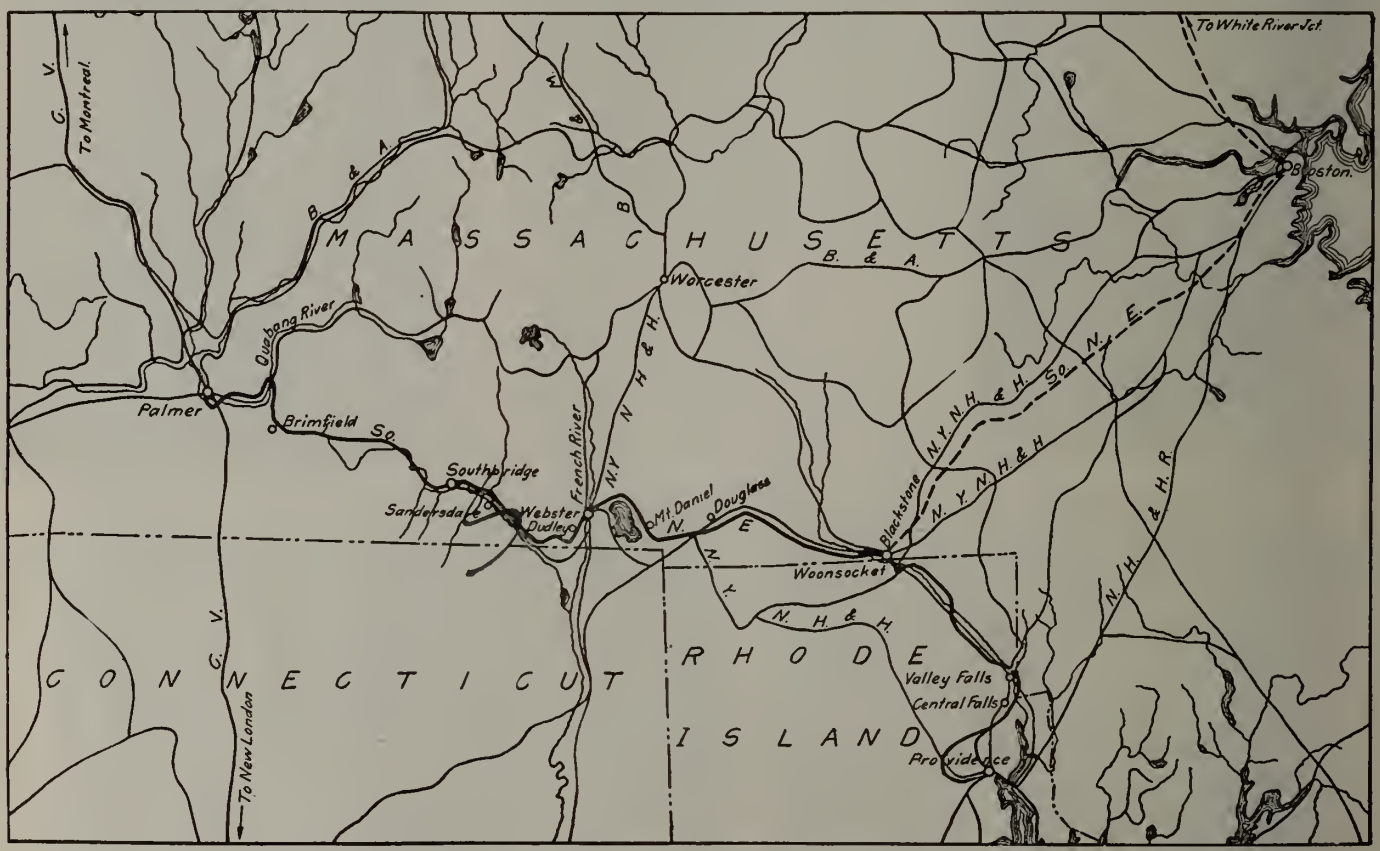
Contracts have recently been signed and construction begun on the new line of the Southern New England Ry., a subsidiary of the Grand Trunk Ry. Co., which is to extend from a junction with the Central Vermont Ry. in Palmer, Mass., to tidewater terminals at Providence, R.I. The new road, although important in itself, is only a part of a general scheme which has been developed by E. H. Fitzhugh, President of the G.T.R. properties in New England, for the extension of this system into the rich commercial territory in Rhode Island, New Hampshire and Massachusetts, including the city of Boston, hitherto occupied almost exclusively by the New York, New Haven & Hartford Rd. and its affiliated interests. The G.T.R. plans, in addition to the Palmer-Providence line, include a line of 35.9 miles from Blackstone, Mass., a station on the new road 17 miles north of Providence, to Boston; also another branch from Douglass on the Palmer-Providence line to Worcester, Mass., 21 miles; and finally a road extending southeastward from a junction with the Central Vermont Ry. at White River Junction, Vt., through Nashua, N.H., to Boston, 133¾ miles. In all, these projects will require approximately 275 miles of main line, together with the numerous sidings and industrial spurs and extensive terminals in Providence and Boston.

The Palmer-Providence line in Massachusetts is being constructed under permission of the state railway commission; the construction of the other lines in Massachusetts, including the Boston terminals, has been authorized by a special act of the legislature; and similar legislative authority has been obtained for the work in Rhode Island. The Massachusetts law provides that the various lines authorized must be located within one year, relocations being permitted; construction must begin within a year from the time of filing the location, and be completed in three years. Under certain conditions the state railway commission is granted the power to extend these periods. Two companies have been organized for construction purposes, one in Massachusetts, the Southern New England Railroad Corporation, and the one in Rhode Island. the Southern New England Ry. Co. Negotiations are under way to obtain the necessary authority for construction in New Hampshire.

As indicated by the foregoing, when all the projected construction is completed the G.T.R. will have a direct line from Montreal to Boston, a short line from Boston to Providence which will form part of a through rail and water route between Boston and New York, and a direct route from Montreal and northern New England to tidewater at Providence through the most prosperous sections of Massachusetts and Rhode Island. The branch between Douglass and Worcester, Mass., will also tap a rich manufacturing region.

The line between Palmer and Providence, which is now under construction, will be a single track for the present, but no expense is being spared to produce a road that can be operated at maximum economy. It extends in a general southeastern direction, passing through the cities of Southbridge, Webster and Blackstone, Mass., thence proceeding directly from Woonsocket to Providence, Rhode Island. In Massachusetts there are 57.69 miles of main line and 7.45 miles of siding. In Rhode Island there is a passenger line from Woonsocket to the Union station at Providence, 17.13 miles, and a freight line from a junction with the passenger line in North Providence to docks at Fields Point, 9.89 miles, together with 37.76 miles of sidings and a special spur of 0.25 miles on Allen's avenue. The work, therefore, includes 84.71 miles of main line and 45.45 miles of sidings and spurs, or 130.16 miles in all. The most extensive switch yards and terminals will, of course, be situated at Providence.

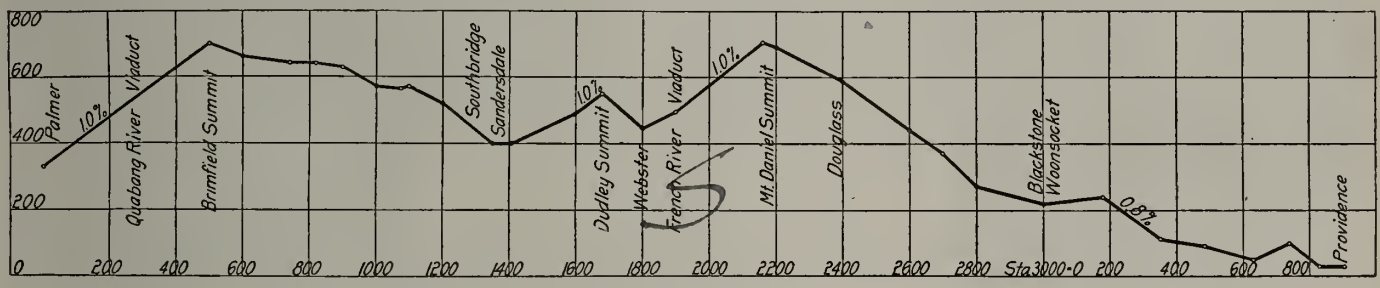
As soon as authority for construction had been obtained and the line definitely located, the work of obtaining right-of-way began. This was a much more difficult task than it is in less thickly settled portions of the country, and many perplexing obstacles had to be surmounted. The Massachusetts law limits the width of the



The G.T.R.'s Palmer-Providence Line and Proposed Boston Line.

right of way to 82.5 feet, which is insufficient in deep cuts or on high fills. Great difficulty was also experienced in defining the various parcels of land purchased for right of way on account of the indefinite wording of most New England deeds. New England was never surveyed into sections, and land is generally described in the deeds by metes and bounds and by reference to old monuments or land marks long since disappeared. For instance, a farm belonging to Wm. Brown is described as consisting of 17½ acres extending from the south boundary of Henry Bowen's land on the north to the north boundary of Alfred Thompson's on the south, etc. It was necessary for the engineers of the railway to accurately determine these boundary lines, and the problems involved may be readily imagined.

The accompanying profile of the line shows the three principal summits which it was necessary to cross, together with the Quabaug, French and Blackstone rivers. These formed the chief controlling points in the location. Starting at elevation 320 at Palmer the line ascends rapidly to the Brimfield summit, 704 ft. above sea level, nine miles from Palmer. Between these points the Quabaug river is crossed twice. From Brimfield there is a gradual descent for 15 miles to elevation 400 at Sandersdale. Leaving this point the ascent is rapid for the next five miles to the Dudley summit, elevation 545. Next comes a descent into the French river valley and a long climb out on the eastern side to elevation 717 at Mt. Daniel, 41 miles from Palmer. From this point the line drops by easy stages to sea level at Providence.



Condensed Profile, Grand Trunk Railway Palmer-Providence Line.

The location of the line, however, involved much more than simply finding the most advantageous route across the various summits and rivers between the terminals, for the problems encountered in numerous grade separations also had to be met. In the entire length of the line there are no grade crossings, even the country highways being elevated over or depressed under the railway in every instance. In fact, the location resolved itself into a task of suitably treating the various crossings with as little disturbance to existing grades as possible. In many instances it was, of course, necessary to change the grades of streets and highways, but no attempt was made to alter those of the steam railways crossed. In Rhode Island alone there are approximately 69 highway crossings carried either over or under the track, semi-tunnels being generally employed where the highway goes over the railway. As a result of the necessity of avoiding grade crossings, coupled with the desire to leave existing street grades in the towns unchanged wherever possible, a detailed profile of the line in Rhode Island through comparatively level country somewhat resembles the lay-out of a roller coaster.

In spite of these difficulties the line has been located with a maximum grade of 1% and 6% maximum curves. The grades are equated 0.04% for each degree of curve, and the curves are spiraled on the Searles system. The spirals, however, are much longer than customary. For example, eleven 33 ft. chords are used in laying out the spiral on a 6° curve, the length of the spiral being 363 ft. On the new line of the Chicago, Milwaukee & Puget Sound Ry. in the west, the spirals on similar curves are only 180 ft. in length. In fact the 6° curves with long spirals on the Southern New England Ry. are about equivalent to straight 4° curves, assuming ordinary angles of intersection. With a 44° angle, the length of a straight 4° curve is 1,100 ft., while a 6° curve with long spirals on the Southern New England is 1,092 ft. in length for the same angle of intersection. The curves will be elevated according to A. R. E. A. standards for 40 miles per hour.

The line includes a great deal of bridge work. Two miles from Palmer occurs the first crossing of the Quabaug river on a steel viaduct 585 ft. long; the same bridge also crosses the state highway and the Central Massachusetts Electric Ry., the maximum height of the viaduct above the valley being 63 ft. Separated from this viaduct by a fill of 80 ft. long is a through plate girder bridge crossing the Boston & Albany Rd.

Four and a half miles east of Palmer is situated the largest steel bridge on the line. It carries the track of the Southern New England Ry. over the Quabaug river, and also over the state highway, a wagon road and the Boston & Albany Rd. The bridge is 1,252 ft. long and 115 ft. above the river, being constructed on a 6° curve and 0.76% grade. It is a viaduct consisting of 11 steel towers connected by 70 ft. girder spans; the towers are about 40 ft. long on top, and of sufficient width to carry the single track.

Another important bridge is situated at North Webster, 36 miles from Palmer. At this point the French river, together with the Boston & Albany Rd. and Norwich & Worcester Rd., are crossed. A timber trestle 1,052 ft. long has been planned. It has a maximum height of 55 ft. and is considered to be more economical than a steel bridge would be in the same place. It is estimated on a 5% basis that where the cost of a steel bridge exceeds that of a wooden one by more than 90%, the latter is the more economical.

Near Millville, 55½ miles from Palmer, will be situated a steel and masonry bridge, approximately 500 ft. long, crossing the Blackstone river and the Worcester-Providence and Boston-Willimantic lines of the New York, New Haven & Hartford Rd. The Boston-Willimantic line crosses over the Worcester-Providence line and the Southern New England Ry. over both.

In the city of Providence, the passenger line enters from the north via Randall's and Leonard's ponds, and passing through a 2,400 ft. tunnel under northwest Providence, between Douglas avenue and Jewett street, emerges at the union passenger station in the centre of the city. A terminal for handling miscellaneous freight shipments will be built adjacent to this line between Valley street and the Woonsquatucket river. The preliminary layout provides two sets of team tracks with a capacity of 136 and 117 cars, respectively, together with inbound and outbound freight sheds. The former is to be 50 x 670 ft., provided with yard and service tracks having a total capacity of 100 cars. A coach yard will also be located in the immediate vicinity.

The freight line to Field's Point leaves the main or passenger line at the northern limits of the city of Providence, and with a wide sweep first to the south and then to the east reaches its destination on Narragansett bay. This line is 9.89 miles long. At the Field's Point terminus docks are being constructed by the city of Providence.

The general contract for the construction of the Massachusetts portion of the road has been awarded to J. Marsch, Chicago, and the contract for the Rhode Island portion to the O'Brien Construction Co., New York. The general contract in Rhode Island does not include the tunnel under the city of Providence. This will be covered by a separate contract to be let later. The steel bridges will be fabricated by the American Bridge Company of New York, and erected by the Strobel Steel Construction Co. of Chicago.

The line is being constructed under the supervision of E. H. Fitzhugh, President of the Southern New England and the Central Vermont railways, assisted by G. C. Jones, Vice President. The engineering officers include H. C. Estep, Engineer of Construction, and J. P. Snow, of Boston, Consulting Bridge Engineer.—Railway Age Gazette.

Improved Baggage Checks.—A baggage check, which is expected to lessen the number of errors and complaints, has just been placed in service by the Pennsylvania Rd. The duplicate portion of the new check is provided with spaces in which are printed a number of the principal "bad order" conditions in which baggage is frequently received for checking. A check, on being delivered to a passenger, will be punched to show whether the piece of baggage is a trunk, suit case or valise, fibre case, or tool chest. Other punches will show the condition in which it is received, whether the bottom, side, top or end is broken, lock or handle broken, hinges loose, old or worn, or whether the piece of baggage is open. In this way the duplicate check will contain a full description of the condition of the baggage when received for shipment. The number on the tag portion of the check is placed at the bottom, while on the duplicate portion it is printed at the top, so that the two can be readily matched when making delivery of baggage. It is expected that with the use of this new form of check the liability of mismatching numbers will be minimized, the delivery of baggage expedited, and the number of claims greatly reduced.

The Quebec Public Utilities Commission has issued general orders re rules for pipes crossing railways and re protection of forests from fires by railways.

Practice of Safe-ending Tubes at the Grand Trunk Railway Stratford Shops.

In shops such as those of the G.T.R. at Stratford, Ont., more attention to the proper planning of the work through the shops is required than in a small shop where the number of locomotives to be handled is small. In the Stratford shops, practically

Fig. 1.—Lifting Tubes to Rattler.

all the locomotives on the Middle and Southern divisions and a large percentage of the Northern division, are handled for repairs, and when the repairs are classed as heavy, calling for the total dismantling of the locomotive, the tubes at the same time require safe-ending. Considering the extensive mileage, and the nature of the country through which most of the company's lines operate, developing heavy traffic, the number of locomotives at all times undergoing repairs calling for the safe-ending of the tubes is large.

The safe-ending department is located in one end of the locomotive shop, adjacent to the erecting floor, from which the tubes are received. The whole floor of the machine part of this department is covered with boiler plate, for the easy movement of the tube-carrying trucks in the course of transition through the several stages of the process.

The first step in the process is the removal of the tubes from the boiler in the usual manner. The tubes as removed are placed in trucks of the form shown in fig. 1, these trucks being mounted on a platform in front of the locomotive smokebox, where the tubes can be easily handled without the operator who is removing them, moving from the one position. The truck, loaded with the complete set of tubes from one boiler, is picked up by the travelling crane and carried down the shop to the safe-ending department, and deposited on the plated floor.

Down the centre of the shop, on one side of the safe-ending department there is the built up structure to the right in fig. 1, which houses the tube cleaning apparatus. The tube truck on the plated floor is run along on to the track in fig. 1, a jib crane operating over its whole length.

There are two tube cleaners, of the box rattler type, with supporting trunnions at the level of the platform on the right. There is a box structure closing in the rattler, and on the platform side of this housing are doors for the insertion of the tubes in the opening in the rattler. On to this platform is raised the set of tubes from the truck, leaving the latter on the track, the tubes being deposited in a pile. Through the door openings, the tubes are rolled, until the whole are introduced into the rattler. The doors are then closed, and the rattler put in motion, a stream of water being incidentally turned in from one of the end trunnions. This continues until the tubes are thoroughly free from scale.

After the proper period of cleaning, the rattler is stopped, with its door downwards, the latter on opening dropping the tubes into a truck placed in the box enclosure directly beneath the rattler. The door from which the tubes are removed is in the background in fig. 2, the tubes as removed being in front, to the right, in the same illustration.

Fig. 2.—Cutting off First Bad End.

The next operation is that of removing one of the damaged ends in the manner shown in fig. 2. This machine is located right at the outlet from the rattler, so that a minimum of handling by the operator is required. The machine employed is of the hollow spindle type, built primarily for this purpose. The tool carriage is secured in a stationary position on the lathe bed, and to the front of the tool carriage there is a swing stop, which can be swung out in line with the tube, so that the operator has a stop against which to push the tube when entering it from the other end, where the chuck face is invisible to him. The firebox, or lightly damaged end, is the one operated on, a very short piece being removed with a cutting off tool. The cutting off tool is so ground on the end as to give a scarfed edge to the tube end. The tool is operated across the carriage by the vertical lever in the hands of the operator. The scarfed tubes are piled in another truck on the near side of the machine on leaving

Fig. 4.—Automatic Safe-end Machine.

it. All this part of the shop is floored with plate. This machine is midway between the two rattlers, and so can handle either equally well.

In line with this last machine, and in the rear of the position in fig. 2, are located the machines for the next operation of applying

Fig. 3.—Flaring the Cut-off End.

the safe-end. This is shown in fig. 3. The truck from the last position is pushed along only a few feet into position on the left of the operator in this illustration. From this truck, they are taken one at a time and placed in the oil furnace in the left background for heating to a working heat on the scarfed end. The machine in the centre of the view is for expanding the ends to fit over the safe-end. The heated tube is placed in the vise jaws of the machine up to the cross plate, used for locating the tubes. The vise jaw to the left is operated by the cylinder, to the

plunger of which it is connected, the cylinder operating from a valve operated by the operator s foot. At the other end of the machine there is another air cylinder, connected to a crosshead in the centre. On the front face of this crosshead there is a taper pin, which is forced into the tube end by operating the lever on the front corner of the machine. This flares the end sufficiently to slip on to the scarfed end of the safe-end piece. This safe-end piece for the tube is mounted on a mandrel on the face of the stand in the right foreground, with the scarfed end out. Immediately on removal from the flaring operation, the still hot end is rammed on the guiding mandrel carrying the safe-end, the impact of the operator driving it on being sufficient to hold the two parts together, although the safe-end is cold. The united pieces are placed on another truck on the right, and moved on for the next operation.

The operation of safe-ending will be interrupted for a moment at this stage to observe the manner of making the safe-end pieces. A machine for automatically producing these pieces is shown in fig. 4. In construction it closely resembles an automatic screw machine, the motions on it being very similar. It is, however, a much simpler machine than an automatic screw machine, from the fact that cutting off and feeding forward are the only operations required. The stock tube is held in a hollow spindle, the front end being guided in a solid steadyrest on the front end of the machine. The tool rises from below, being forced upward into the tube at the rear face of the steadyrest by a cam on the worm gear shaft across the machine. The tube is fed forward after each cut, by the attachment guided on the bars to the rear, shown in more detail in fig 5. On the front face of the machine, attached to the other end of the worm gear shaft across the machine, before referred to, there is a slotted crank, to which is attached in any position along this slot by a clamp nut, the forward end of a connecting rod. The other end of the connecting rod is attached to a horizontal bar, guided in bearings on the front of the machine, all as shown in the foreground in fig. 5. At the near end of this guided bar, there is an upward arm, attached at the upper end to a block through the centre of which the tube in the machine passes. This arm operates a clamping dog on each side of the tube, which clamps the tube in this block as the tube moves forward, but slips on the return. This is the tube feed.

The chucking of the tube is also automatic, the mechanism for the operation of the chuck being located on the near side of the machine in fig. 4. On the top of the machine an air cylinder is pin connected at the rear to the frame. The plunger rod is attached to an arm which encircles the chuck, and by which the chuck is opened and closed. The valves for operating this chuck are shown in detail in fig. 6. To the right, an air pipe from below connects with twin valves attached to a projecting arm from the side of the machine. From each of these valves a flexible air connection leads, one to each end of the chuck actuating cylinder. On the end of the worm gear shaft are two small cams, in the plane of the valve plungers which they operate. One cam lets air into the cylinder for the closing, and on the release of that end of the cylinder, the air is let into the opposite end. The worm gear is operated by a worm from a shaft along the back face of the machine, driven in turn from the large gear which engages the pinion on the spindle of the machine.

The operation of the machine is as follows: With the tube in position for cutting off, the cutter rises from below, severing the tube, the tool at the same time scarfing the end. The piece as cut off drops down the inclined plate in front of the steadyrest, the cutting liquid running back into the machine through the slit in the plate. At that point, the setting of the cams on the worm gear shaft causes the release of the chuck, and simultaneously the feeding mechanism grips the rear end of the tube and feeds it through the chuck the length of stroke to which the adjustable crank on the front of the machine is set. When fed forward that amount the other cam on the worm gear shaft causes the chuck to close. the operation from that point being repeated.

Returning to the operation of safe-ending, the truck of tubes on the ends of which the safe-end pieces have been forced is moved along a little further to the position shown in fig. 7, the ends of the tubes mounted on the truck being visible to the left in the view. Here, the end carrying the safe-end is placed in the furnace, and heated to a welding heat, when the part to be welded together is placed in position under the vibratory air hammer, the operation the operator is performing in the illustration. The hammer dies to the right of those in use for this last operation are used for swedging down the tube end for the copper ferrule used between it and the tube plate. Between these two operations, the loose scale on the outside of the tube is scraped off by rubbing the tube back and forth a few times in the cut outs in the plate

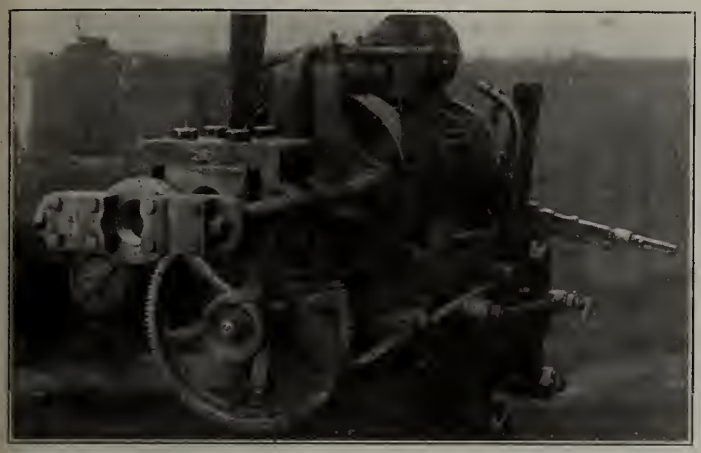


Fig. 5.—Automatic Feeding Mechanism.

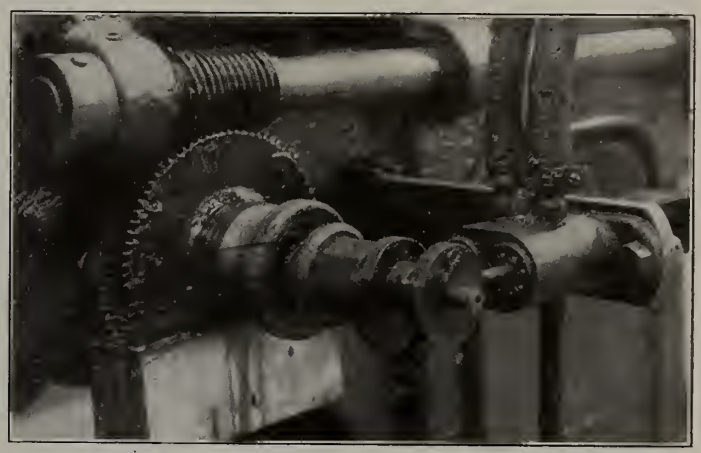


Fig. 6.—Automatic Chucking Mechanism.

Fig. 7.—Swedging First Tube Ends.

Fig. 8.—Cutting-off and Swedging Second End.

projecting from the right side of the hammer frame. This operation completes the operations on one end of the tube.

From this point the tube truck is moved some little distance further down the shop on the plated floor to a position to the left of the point in fig. 8. Here, the tubes have the other bad end heated to a working heat in the furnace on the extreme left, from which they are carried over to the saw, the table of which is in the left foreground. The tube is here placed in a cross carriage on the table, this cross carriage being counter-balanced by weights over pulleys on the front edge of the table as in the lower left hand corner of the illustration. The hot saw, revolving at a high velocity, rapidly cuts off the bad end, cutting the tube to length, the tube carriage having a gauging stop.

The tube thus cut off is passed across the machine to the machine to the right in other end being supported in wooden blocks on a post on the rear of the carriage of the lathe, to the left of the tool post. These wooden blocks, which clamp together, act as a steadyrest. The tool post carries a cutting off tool and a marking tool, the latter to the left of the cutting off tool at a distance equal to the length of the finished ferrule. The marking tool is set back just far enough to mark the surface of the tube as the cutting off tool is through the tube. This leaves a mark for the next cut, which the operator can quickly follow, with a marked saving in time. On each ferrule being cut off, the operator supports a scraper on the end of the cutting off tool, and scrapes off the burr on the inner edge of the tube end. By this method the ferrules are quickly cut off, and the removal of the burr makes them at once usable in the firebox end of the boiler, fitting over the swedged ends of the tubes.

Fig. 9.—Testing Safe-ended Tube.

Fig. 10.—Cutting off Copper Ferrules.

the illustration, a machine similar in construction to that in fig. 3, the end of the tube being here flared. The cross cylinder clamps the tube, and the end cylinder flares the end. The balance of the tube department is in the background in this illustration, fig. 8.

The tubes, with both ends thus finished on, are ready for testing in the machine in fig. 9, located a little further along the shop. The head at the far end of the machine is stationary, but that on the near end is movable, like the tailstock of a lathe, to accommodate varying lengths of tubes. The tube is placed up against a washer on the far head, and a plunger on the near end, carrying a washer face, is forced out against that end. Water is introduced under pressure through an opening in the centre of each end washer plate. It is customary first to introduce the water from the far end before closing up the near end, as this forces all air out of the tube, the bed of the machine being on an upward incline toward this end. On the filling of the tube with water, this end, which forms a differential cylinder, is closed, and air pressure introduced behind the large end of the differential piston, producing a water pressure of about 300 lbs. in the tube, the gauge on the wall to the rear indicating that pressure. Both valves are on the front of the machine bed in the position assumed by the operator. To save time in draining out the tube after testing, the large box built up of boiler plate is placed at the far end of the machine, the tubes being drained therein before placing on the truck for removal to the erecting shop, where they are again placed in the boiler.

The copper ferrules used in the firebox end of the tubes are cut off in the manner indicated in fig. 10. A long copper tube is chucked in the lathe head to the rear, the

Birthdays of Transportation Men in November.

Many happy returns of the day to—

J. O. Apps, General Baggage Agent, C.P.R., Montreal, born at Tara, Ont., Nov. 9, 1877.

A. B. Atwater, Assistant to President, lines west of Detroit and St. Clair rivers, G.T.R., Detroit, Mich., born at Sheffield, Ohio, Nov., 1845.

G. B. Burchell, General Manager, Maritime Coal Ry. and Power Co., Joggins Mines, N.S., born at Sydney, N.S., Nov. 1, 1877.

J. R. Cameron, Assistant General Manager, Canadian Northern Ry., Winnipeg, born at Truro, N.S., Nov. 5, 1865.

L. D. Chetham, City Passenger Agent, C.P.R., and District Passenger Agent, Esquimalt and Nanaimo Ry., Victoria, born at Matlock, Eng., Nov. 5, 1869.

F. H. Clendenning, District Freight Agent, B.C. Coast Service and Trans-Pacific Steamships, C.P.R., Vancouver, B.C., born at Montreal, Nov. 9, 1881.

F. Conway, acting General Superintendent, Kingston and Pembroke Ry., Kingston, Ont., born at Ernestown, Ont., Nov. 19, 1850.

A. S. Cook, Inspecting Engineer, National Transcontinental Ry., Ottawa, born at Penobsquis, N.B., Nov. 20, 1873.

W. L. Crighton, Advertising Agent, Intercolonial Ry., Moncton, N.B., born at Derby, Eng., Nov. 9, 1871.

W. Cuthbert, Fuel and Tie Agent, G.T.R., Montreal, born at Longueuil, Que., Nov. 9, 1856.

W. Downie, General Superintendent, Atlantic Division, C.P.R., St. John, N.B., born at Rock Currie, Ireland, Nov 12, 1850.

Jos. Dubrule, jr., Manager, Canadian Pacific Car and Passenger Transfer Co., Prescott, Ont., born at Spencerville, Ont., Nov. 14, 1872.

R. L. Fairbairn, General Passenger Agent, Canadian Northern Ry., Toronto, born at Stillwater, Minn., Nov. 24, 1880.

Grant Hall, Assistant General Manager, Western Lines, C.P.R., Winnipeg, born at Montreal, Nov., 1863.

John L. Hodgson, Master Car Builder, Western Division, G.T.R., Port Huron, Mich., born at Simcoe, Ont., Nov. 15, 1858.

J. McGillivray, Superintendent, Inverness Ry. and Coal Co.'s lines, Inverness, N.S., born at Nairn, Scotland, Nov. 13, 1867.

T. E. Martin, Local Freigbt Agent, C.P.R., Quebec, Que., born at Beauharnois, Que., Nov. 23, 1852.

C. Murphy, General Superintendent of Transportation, Eastern Lines, C.P.R., Montreal, born at Prescott, Ont., Nov. 20, 1865.

W. J. Quinlan, District Passenger Agent, Grand Trunk Pacific Ry., Winnipeg, born at Montreal, Nov. 21, 1883.

H. P. Sharpe, General Agent, Dominion Express Co., Toronto, born at Brockville, Ont., Nov. 24, 1864.

G. H. Shaw, General Traffic Manager, Canadian Northern Ry., Toronto, born at Smiths Falls, Ont., Nov. 25, 1859.

F. M. Spaidal, General Superintendent, Canadian Northern Quebec Ry., and Quebec and Lake St. John Ry., Quebec, born at Gananoque, Ont., Nov. 13, 1858.

J. Sparks, Assistant General Baggage Agent, Western Lines, C.P.R., Winnipeg, born in London, Eng., Nov. 25, 1874.

H. P. Timmerman, Industrial Commissioner, Eastern Lines, C.P.R., Montreal, born at Odessa, Ont., Nov. 6, 1856.

H. E. Whittenberger, Superintendent, Middle Division, G.T.R., Toronto, born at Peru, Ind., Nov. 9, 1864.

C. G. Washbon, Resident Engineer, C.P.R., Winnipeg, born at Morris, N.Y., Nov. 27, 1887.

Proposed Electrification in Chicago.—A conference of operating officials representing 30 railways and engineering staff of the Chicago Association of Commerce committee on smoke abatement and electrification was held recently to consider the mechanical difficulties presented in substituting electrical for steam operation. Each representative was requested to present his own views on the subject, based upon the operating conditions on his lines. In discussing the question of using a third rail in yards some of those present said that the network of track is already so complicated that the addition of an extra rail would increase materially the danger to yard employes and at the same time decrease the efficiency of the service. The use of the overhead trolley instead of third rail was thought also to be unsatisfactory as it would endanger the life of men on the roofs of cars.

Railway Mechanical Methods and Devices.

Sawing Pilot Slats at Grand Trunk Railway London Shops.

A very simple method of forming the horizontal slats that compose the body of the standard G.T.R. pilot is in use at the company's shops at London, Ont., in the woodworking department. The slats of wood are finished first on all sides, and the ends trimmed off at an angle to fit the backing and the central ridge of the pilot. The difficult part of machining the slats lies in the forming of the front bevel edges.

In these shops, this part of the work is performed on the band saw in the manner illustrated. Across the table to the right of and parallel to the saw, there is clamped a guiding strip of wood. A few inches to the left of the saw, there is clamped another piece, this latter being tapered from the front to the rear. The point of this wedge piece is in a line across the table at right angles to the saw, so that when the end of the slat is laid on the table the end will be level, and just ready to ascend the slope of the wedge. The cut of the saw thus enters at right angles to the face of the slat.

As the cut is pushed forward, the front end of the slat, which continues to rest on the wedge piece, is gradually raised, tipping the slat up on edge against the guiding strip. This tipping effect increases to the end. Experiment determines how far off to the left the outer end of the wedge should be located to give the right amount of tipping effect. Each one of the slats in the height of the pilot has a different amount of edge cut off to give the smooth sloping surface to the face of the pilot, each of the slopes being a matter of experiment. The slats for one side of the pilot are made this way, and the corresponding slats for the other side are made by reversing the positions of the guiding strip and wedge.

It is customary to make up several pilots at a time, so that the operator can make up that number of slats of each size at a setting, the location of the wedge for each size being known.

Sawing Pilot Slats to Shape on the Band Saw.

The British Columbia Government has resumed possession of some 4,000,000 acres of land, which had been granted in aid of the British Columbia Southern Ry. and the Columbia and Western Ry. The lands have been acquired from the C.P.R., which took over the rights and properties of the two companies named at 40 cents an acre.

Motor Driven Pipe Threader at Grand Trunk Railway Port Huron Shops.

A new use for the air motor is shown in the accompanying illustration of an air-operated pipe threading machine at the G.T.R. shops at Port Huron, Mich. The pipe threading machine is of a standard make, of the small kind designed for band operation on a supporting bench, conveniently located to the job. In this case the motor is mounted on a bench in the pipe fitting department.

Motor Operated Pipe Threading Machine.

The air motor, connected to the driving pinion of the pipe cutter, is mounted on a supporting carriage in front of the table end, in a permanent location. This supporting frame is built up of wooden scantling, meeting at the top, in which there is a recess on both sides for the reception of the handles. There is a permanent air connection to the end of the handle, the intake of the motor, controlled in the usual manner with the handle valve. This has been found to be a most useful appliance around the shop for cutting the threads on pipe, and is naturally much more rapid than operation by hand.

Tender Truck Repairs at the Grand Trunk Railway Stratford Shops.

In the G.T.R.'s locomotive repair shops at Stratford, Ont., R. Patterson, Master Mechanic, the tender department is in a wing of the large locomotive shop. The various repair tracks in the tender department are entered from a travelling table down one side of the shop. The tracks at the end from the locomotive shop are for the tender tanks while under repair, the tracks at the other end being set aside for the truck repairs incidental thereto. The two tracks set aside for this purpose are shown in the accompanying illustration, where it will be noted that instead of having the tracks on the level of the floor, as in the usual repair shop, they are raised about a foot or so above the ground in order to make the tracks easier of access for the mechanics, requiring no bending over.

The trucks, as they come from under the tenders at the end of the shop to the left in the illustration, are carried along to the two tracks shown, which are located in the end of the locomotive shop, being handled by a 25 ton electric travelling crane, which picks them up and places them on the elevated tracks, where they are easy of access by the workman.

The tracks are raised on short cast iron standards, ribbed at the four corners for rigidity. The rail base fits in the recessed top, into which it is secured. The truck can be dismembered on these elevated tracks, and the bolster is even then, resting as it will be on the elevated tracks, in a convenient working position.

Elevated Tracks for the Repair of Tender Trucks.

The Canadian Northern Prairie Lands Co. sold 320 acres during August, realizing $4,960, or $15.50 an acre. There remain 68,600 acres unsold.

During August, 25 employes were killed, and 53 were injured, in the course of their work in connection with the operation of steam railways in Canada. Of the fatalities, 10 were due to collisions, six to being run over, two each to being crushed by cars and to being struck by trains, and one each, to jumping from a locomotive, to a fall, to falling material, to being buried under coal in the tender presumably while same was being filled, and to electrocution.

Grinding in Throttle Valves at the Grand Trunk Railway Stratford Shops.

In the steam pipe department of the G.T.R. shops at Stratford, Ont., there is in use a rig for grinding in throttle valves, which is both effective and simple in construction, but withal a very cheap rigging to make up.

The throttle valve is held on two projecting strips of bar iron from a bench, by the two supporting lugs, bolting the valve securely into place. The valve is revolved on its double seat by an air motor attached to the upper spindle, emery and oil being introduced between the rubbing surfaces in the usual manner.

The principal feature of the device is an attachment for raising and lowering the valve, with regard to the seat, in the approved manner, in order to gain a smoothly ground in valve. On a plate, shown in the accompanying illustration on the ground below the valve, there is attached a vertical supporting bracket for the guidance of a vertical rod. The lower

Device for Grinding in Throttle Valves.

end of this rod rests on the shorter end of a fulcrumed lever, on the longer end of which the operator presses his foot as shown. The vertical rod is in two sections, telescoping each other. The upper section is a length of pipe fitting loosely over a rod, the pipe having diametral holes at frequent intervals along its length, for the adjustment of the length of the combined rod.

The rod is so adjusted for length that when the foot lever is in a horizontal position, the upper end of the rod, passing through the valve spindle hole in the lower end of the casting, touches the lower surface of the double valve. The operation then is that the operator, as the valve is revolved by the air motor, presses on the foot lever, raising the valve off its seats. This permits a flow of the oil and emery, when the valve is again lowered and the grinding is continued. This operation is repeated as long as necessary.

The lifting attachment is movable into any required position, and is not secured to the floor in position under the valve. This makes the attachment of use in similar positions elsewhere.

The Handling of Sections and Section Foremen.

Following is the report of a committee of the Roadmasters and Maintenance of Way Association of America, presented at the annual meeting at Buffalo, N.Y., recently:—

HOW TO SECURE FOREMEN.—It is agreed that, to secure competent foremen, good wages must be paid and to secure student foremen wages should be paid sufficiently in excess of section laborers to make it attractive to young men with fair education, ambition and ability, to induce them to stay in the track department, rather than work on farms or other places where wages may be higher but steady employment uncertain and the chance for promotion obscure.

Student foremen should be placed with the most progressive section or yard foremen so that they may learn all the latest methods and be taught in the most up to date manner how to acquit themselves when promotion comes to them and they are thrown on their own resources. It goes without saying that section or yard foremen, so designated as teachers of prospective foremen, will endeavor, out of personal pride and with characteristic loyalty to their company, to turn out men who will be a credit to their instructors. These men should be paid 25 cents or more a day, in addition to the pay of a regular track laborer, for a day of 10 hours and they, as well as all foremen, should be paid for overtime over the specified working hours, the same as other employes.

If after working one or two years on a straight section, student foremen are moved into a terminal or yard, they will get experience in switch work, heavy track repairs, and work of this character, and an insight into many phases of track work not encountered on sections, thus making them much more resourceful when the time comes for them to assume control of their own sections. With proper training, as outlined, and with the prospect of inviting wages as a section, yard or extra gang foreman, when the time for promotion comes, the problem of securing competent foremen will to a great extent be solved.

There should be four student foremen on every division of 25 sections and additional ones where the number of sections exceeds this. A yard foreman should receive more wages than a section foreman and it should be considered a promotion for the latter to be placed in charge of a yard. The pay of an extra gang foreman should be larger than that of a yard foreman and men selected to handle extra gangs should be next in line for the position of assistant roadmaster. It should be the settled policy of every railway. All promotions from that of student foremen and extra gang foremen to roadmaster should be held before the wide awake, ambitious man as an inducement for him to work in the maintenance of way department.

A merit system is also recommended, whereby due credit can be given to foremen in every capacity for alacrity, resourcefulness and initiative in cases of emergency, together with a full appreciation of their duties and responsibilities both night and day. The position of foreman in the track department would then be desirable.

LENGTH OF SECTIONS.—Where the equivalent mileage basis of designating length of sections is not used, a section of 4 tracks should be 2 miles long; 3 tracks, 2½ miles; 2 tracks, 3 miles; and 1 track, 5 miles. Equivalent mileage is usually figured on the principal railways at the rate of 1 mile of main track to a mile; 2 miles of main passing siding to a mile; 3 miles of spur, or commercial track, to a mile; and 15 switches to a mile. In yards, equivalent mileage will regulate the territory which a foreman with a given number of men should have under his jurisdiction.

ORGANIZATION OF SECTION.—Each section should consist of a foreman and one man to each mile of track in summer and one man to two miles of track in winter, when conditions are normal. In severe weather, however, when ice forms and snow storms prevail, a foreman should be allowed to use his judgment in having extra men to keep switches clean and tracks open and to assist wherever necessary in order to keep traffic moving from the physical standpoint of operation in such cases. Each section foreman should have an assistant for every 10 men, the assistant to work the men and prevent them from getting in the way of trains.

The word "section" embraces all main line tracks and main line switches, sidings, freight house tracks, etc., at all way stations and through large yards; yard sections to include all tracks of every description outside of main line switches.

Railway and Allied Associations, Clubs, Etc.

The names of persons given below are those of the secretaries.

CANADIAN CAR SERVICE BUREAU, J. E. Duval, 401 St. Nicholas Building, Montreal.

CANADIAN FREIGHT ASSOCIATION (Eastern Lines), G. C. Ransom, Canadian Express Bldg., Montreal.

CANADIAN FREIGHT ASSOCIATION (Western Lines), W. E. Campbell, 502 Canada Building, Winnipeg.

CANADIAN RAILWAY CLUB, J. Powell, St. Lambert, Que. Meetings at Montreal 2nd Tuesday each month, 8.30 p.m., except June, July and August.

CANADIAN SOCIETY OF CIVIL Engineers, C. H. McLeod, 413 Dorchester St. West, Montreal.

CANADIAN STREET RAILWAY Association, Acton Burrows, 70 Bond Street, Toronto.

CANADIAN TICKET AGENTS' Association, E. de la Hooke, London, Ont.

CENTRAL RAILWAY AND ENGINEERing Club of Canada, C. L. Worth, 409 Union Station, Toronto. Meetings at Toronto 3rd Tuesday each month, except June, July and August.

EASTERN CANADIAN PASSENGER Association, G. H. Webster, 54 Beaver Hall Hill, Montreal.

ENGINEERS' CLUB OF MONTREAL, R. W. H. Smith, 9 Beaver Hall Square, Montreal.

ENGINEERS' CLUB OF TORONTO, R. B. Wolsey, 94 King St. West, Toronto.

NOVA SCOTIA SOCIETY OF ENGINeers, A. R. McCleave, Halifax, N.S.

QUEBEC TRANSPORTATION CLUB, J. S. Blanchet, Quebec.

WESTERN CANADA RAILWAY CLUB, W. H. Rosevear, 251½ Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.

Proposed Changes in M.C.B. Rules of Interchange.—The Master Car Builders' Association has recently taken a special letter ballot of members on proposals to abrogate the rules which penalize the delivering line for owners' defects, and to add a direct 10% to the total labor and material charges as shown on the monthly bills. Both of these proposals are recommendations of the arbitration committee, and have been approved by the executive committee.

Design, Construction and Inspection of Locomotive Boilers.

Following is the conclusion of the American Master Mechanics Association Committee's report on this subject, the first portions of which were published in Canadian Railway and Marine World for September and October:

KELLEY METHOD OF STAYING FLUE Sheets.—Twelve members advise that they have had no experience with this method. Two members that have used this method advise that no advantage was found and have removed the same. Another member reports that he used five stays in small

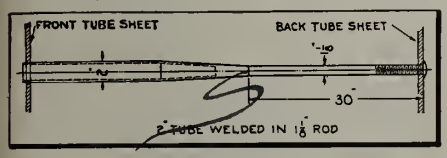


Fig. 27.—Method of Staying Flue Sheets.

boilers containing about 200 flues, and three stays in larger boilers, and believes that it is good practice and tends to prevent flues leaking. Another member is experimenting, as shown in fig. 27, but cannot give any information as regards the performance.

TUBE.—It is the consensus of opinion of those reporting that 2 in. tubes are preferred, until the length of tube exceeds 16 ft., when 2¼ in. tubes are preferred.

Taking into consideration that a 2 in. tube will give a greater amount of tube heating surface, and the cost of maintenance is less, and less damage is done to the tube sheets in working over flues, your committee suggests that further consideration be given to the use of 2 in. tubes in lengths greater than 16 ft.

THICKNESS OF FRONT TUBE SHEET. —Half inch and ⅝ in. being used by the majority of the members who replied to the circular. One member uses 9-16 in. and another uses ¾ in.

THICKNESS OF BACK TUBE SHEET.— One half in. tube sheets are being used by 16 of the members. Two members use 9-16 in. and one uses ⅝ in. All but three report having more or less trouble with flue sheets working up on account of frequently working on the flues, causing the flue sheets to crack across the top of the flange of the sheet.

WIDTH OF BRIDGE in the front tube sheet varies from ½ to 15-16 in.; ¾ in. is used by the majority of members. Width of bridge in the back tube sheet varies from 11-16 to 15-16 in.; ¾ in. is used by the majority of the members.

FLUE SETTING.—Two members advise that they had tried soft iron ferrules with very little success. One member advises that they had a limited experience trying to set flues in the back flue sheet without any coppers, but found that it did not work satisfactorily, and that they are now experimenting with a combined copper and iron ferrule, but have not had these under test long enough to make any report. One member advises that they use soft iron shims on the front flues to avoid excessive expanding.

SETTING OF FLUES IN THE FRONT Tube Sheet.—The consensus of opinion of the roads reporting is that tubes should be rolled in the front tube sheet without any ferrules, and 10% of the flues, equally distributed, should be beaded with a beading tool.

TUBE SETTING IN BACK SHEET.— Figs. 28, 29 and 30 show the practice followed out by some of the members in setting the tubes, which are giving good results. Fig. 31 shows application, maintenance and removal of flues in locomotive boilers as used by three members. Tube setting of this kind gives a large bridge, good circulation of water at the back tube sheet and at the same time the inside of the flue is reduced at the end so that any cinders which will pass through the swedged end will not clog the flues. The instructions in connection with this plate are as follows:

PREPARING FLUE SHEETS.—Holes in new firebox flue sheet shall be 1⅞ in. diameter. Holes in new smokebox flue sheet shall be 2 1-32 in. diameter. Holes in old flue sheet more than 1-32 in. out of round must be reamed, reamer A, fig. 31. Inside and outside edges of flue holes in both sheets must be slightly rounded to remove sharp edges.

TABULAR STATEMENT OF FLUE Setting Method.—

Back End. Operation.	Front End. Shim.
Expand copper ferrules.	Roll.
Drive in flues.	Dudgeon roller by air.
Roll.	
Bead and caulk.	
Expand.	

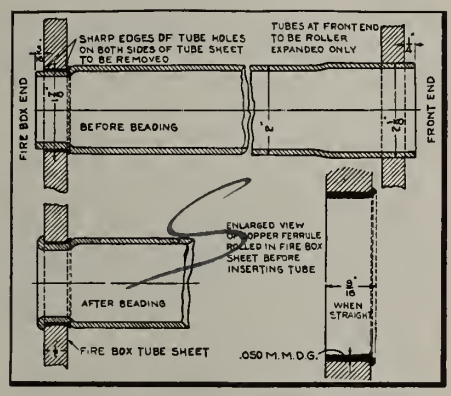


Fig. 28.—Method of Setting Flues in Flue Sheet.

Tool Used.
Prosser expander.
Sledge and pin with collar.
Dudgeon roller by small air motor.
Beading tool in air hammer.
Prosser expander.

holes are large it is desirable to use enough heavier ferrules to bring the internal diameter of ferrule when expanded into flue sheet to ⅛ in. less than flue diameter. The ferrule should be set into flue hole flush with fireside and expanded into place with Prosser expander (C).

Swaging Flue (D).—Great care should be taken to give the swage the right length and to have it terminate in as abrupt a shoulder as possible. The flue, after it is swaged, should be annealed and the scale removed from the portion entering the sheet. Grinding this scale off by machine is desirable, but in the absence of a grinder the removal of the scale with a file will answer. The flue when driven into the sheet (E) should extend 3-16 in. through the sheet on the fire side.

Rollings (F).—The front end of the flues having been shimmed, when necessary, both the back and front ends are rolled with the dudgeon or other suitable roller, with proper appliances they may be safely and economically rolled by air; the rolling of the back ends must be done by an experienced boilermaker, and the motor must not be larger than a Thor no. 22 or its equivalent.

Beading (G).—This may now be done with a beading tool in an air hammer. Do as little hammering with the beading tool as possible, and do not work bead to a feather edge, but leave as much metal as possible for future caulking.

Expanding (H).—Particular stress should be placed upon this, the most important step in the flue-setting process. Care should be taken that the flue shoulder when heavily expanded bears snugly and firmly against the flue sheet. Hammer not to exceed 4 lbs. after prossering the front ends then bead a sufficient number for safety which finishes the flue setting.

Back ends of flues or safe ends when used in back flue sheet must be cut off square in pipe machine and burr removed by reamer.

Wheel-flue cutters must not be used on account of leaving a heavy burr which splits when beading over.

Air motor and roller are only to be used on initial setting. In reworking flues, the Prosser expander only is to be used, and rollers must not be used, as they force the

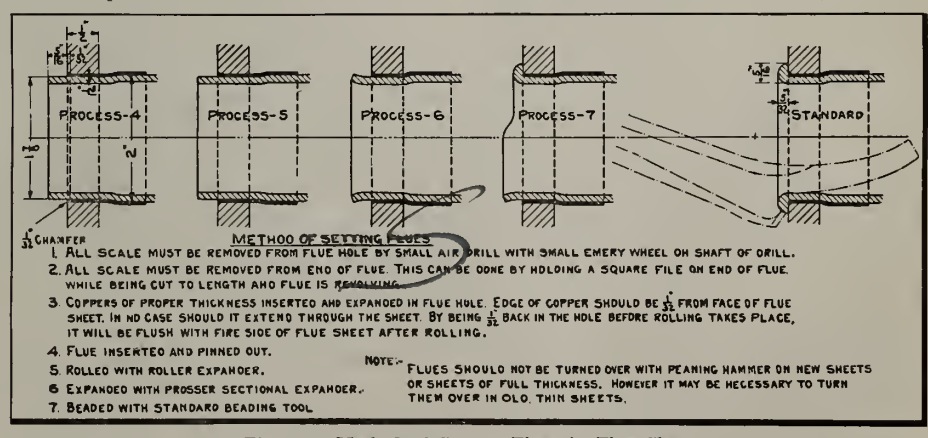


Fig. 29.—Method of Setting Flues in Flue Sheet.

Flue sheet holes (A, fig. 30).—Care should be taken that holes in flue sheet are true, smooth and free from burrs and sharp edges. It is desirable that the flue hole have a fillet especially on the water side, of about 1-32 in. radius. A sharp edge around the hole often cuts the ferrule in two, even cutting into the flue. The diameter of the flue hole should be the same as outside diameter of flue plus 1-32 in.

Copper ferrule (B).—For New York this should not be far different from no. 16 b.w.g. In old flue sheets when the flue bead away from the sheet.

Applying Copper Ferrules.—Copper ferrules 1¾ in. inside diameter, ½ in. long, .095 in. in thickness shall be used in firebox flue sheet only. Ferrules shall be secured in place with straight expander, B, fig. 31, taking care that shoulder of expander is tight against flue sheet, which shall bring edge of ferrule 1-32 in. from fire side of sheet.

Preparing Flues.—Flue safe ends should be 5 ins. long, except that new iron flues shall have safe ends 4 ins. long, and when

shall be placed in back flue sheet with a these flues are first removed the 4 in. ends will be cut off completely and 6 in. ends applied, after which 5 in. ends should be used. Flues shall be swaged as at D, to 1 11-16 ins. outside diameter by 3 ins. long, including taper at firebox end, for new work; for old work, just enough to enter the copper ferrule. All scale must be removed from swaged ends of flues before application. Smokebox end of flues shall not be more than 1-32 in. less in diameter than holes in the smokebox flue sheet. If necessary, liners may be used.

Fastening of Flue in Flue Sheet.—Flues

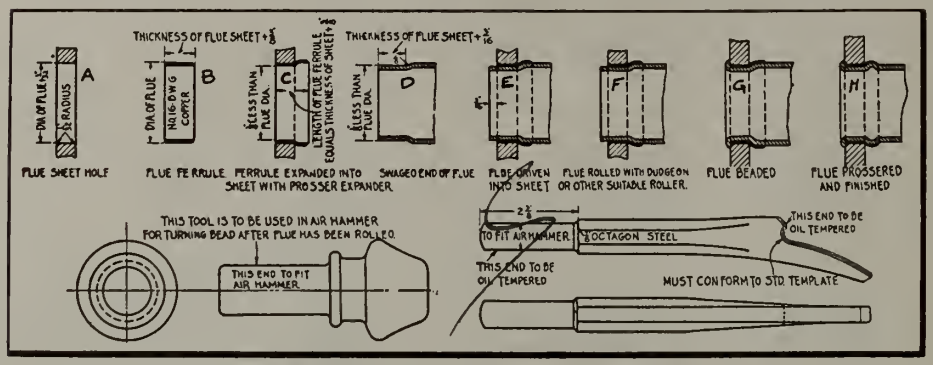


Fig. 30.—Method of Setting Flues in Flue Sheet.

bar, E, and project ¼ in. through the sheet. Gauge, F, shall be used in checking location of flues. Flues shall then be fastened at firebox end with straight sectional expander, G. While flue is being fastened it may be held in place at front end, using bar, E. Straight sectional expander shall be checked with master gauge, H, fig. 8. Before using sectional expander, and in order to obtain exactly the proper length of flue for beading, flues may be rolled lightly to fasten them in sheet with roller expander, O. After all flues are fastened they shall be flared at firebox end, using flaring tool, I, and long stroke riveting hammer.

Expanding Flues.—Flues at firebox end shall be expanded with sectional expander, J, and long stroke riveting hammer. Roller expander must not be used. Pin shall be driven into expander until flue is solid against flue sheet. This must be done three times, expander to be slightly turned before each operation. The expanding shall be performed as follows:—First, two vertical rows, from centre to top of sheet. Second, same rows from centre to bottom. Third, the two horizontal centre rows from centre to right. Fourth, same rows from centre to left. Fifth, all remaining flues. All flues must be carefully inspected after expanding to assure that recess in each flue is the full depth of recess in expander and even all around the flue. Sectional expander, J, to be checked with master gauge, K.

Beading Flues.—Flues in firebox flue sheet shall be beaded with standard beading tool, L, and short stroke riveting hammer. Care must be taken so that nothing enters between head and flue sheet. Beading tool must conform accurately to master gauge, M, at all times. Smokebox end of flues shall be tightened with flaring tool, N, before rolling takes place. All flues in smokebox end shall be rolled with roller expander, O.

Flue Maintenance.—The firebox end of flues in service must be expanded at regular intervals with sectional expander, J. This work shall be done when boiler is empty and all flues thoroughly cleaned out. Flue leaks in the firebox must be stopped with the sectional expander and not with roller expander nor beading tool. If beads are slightly away from flue sheet, standard beading tool shall be used to bring beads tight to sheet.

Sectional expanders and beading tools must be kept standard by frequently comparing with standard gauges. Any beading tool not conforming to gauge must be sent to principal shop for repairs; these tools must not be repaired at any other shop.

All shops and engine houses must be equipped with standard gauges. All gauges will be made where master gauges are kept.

To remove flues, use flue cutter, P, for the front end, cutting off flues as close to the front flue sheet as possible. Back ends should be split as little as possible, so that it will not be necessary to use safe ends longer than 5 ins.

SETTING OF SUPERHEATER TUBES.—Front tube sheet. Only eight members have had any experience with setting large superheater tubes. The practice followed out mostly is that the tube is rolled and beaded as shown on fig. 32, and this type of setting is suggested by your committee for further consideration.

BACK TUBE SHEET.—Eight members advise that they use copper ferrules; one member who omitted copper ferrules is having good success with this method.

The consensus of opinion of the roads

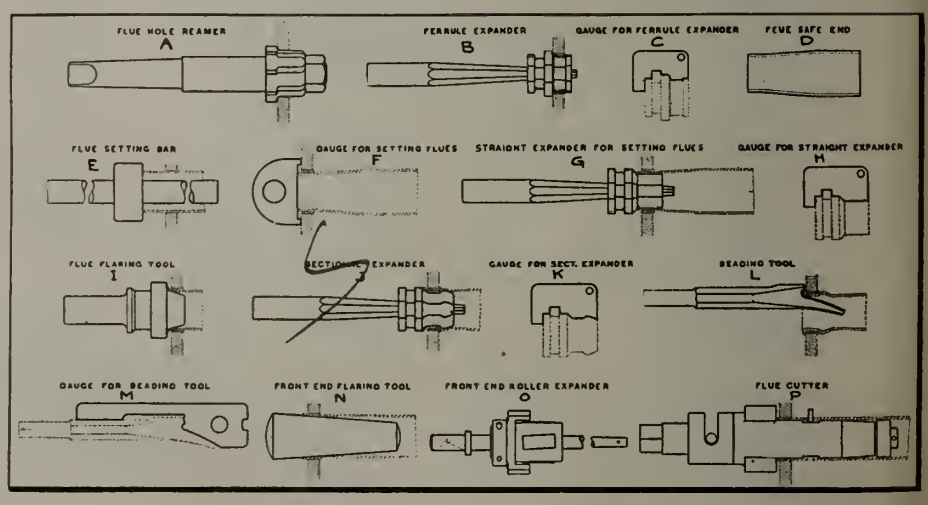


Fig. 31.—Tools Used in Preparation of Flue Sheet.

reporting is that the type of setting shown on fig. 32 is preferred, and your committee suggests this setting, except that the copper ferrules sbould be no. 13, .095 in. thick, instead of no. 16, .065 in. thick.

CIRCULATION OF WATER.—Your committee took up the question with the members whether any of them employed any special feature of design to facilitate circulation of water. We find that no member has any special design for this purpose. Four members advise that they use baffle plates in the boiler shells, located ahead and rear of the dome. This is to prevent, as much as possible, the water from surging when making quick stops.

Your committee has no recommendation to make in regard to the use of baffle plates.

Seventeen members deliver feed water to boiler in the first course on the horizontal centre line. The distance from the front flue sbeet varies; the minimum distance is 22 ins. and the maximum 6 ft. Five members advise that they deliver feed water to the boiler through the top as well as from the side. One of these members advises that they have never been able to find any particular improvement which the top check has over the side check. Two of these members prefer the water to be fed into the boiler from the top. Boilers having the checks on top of the boiler have a pan shape deflector under the check valve which catches the water and prevents any direct stream of water falling on the top of flues. One member advises that they deliver the feed water in the first course on the horizontal centre line and use a deflector plate placed a short distance away from the boiler course. This is to direct the water to the bottom without striking the tubes. Four members have an attachment on the inside of the injector check to deliver water upward away from the tubes. One member advises that in addition to circulating water from the horizontal line of the boiler they have some locomotives with the delivery pipe passing through the back head, extending from 3 to 6 ft. from the front tube sheet, and the end of the pipe set to deliver water towards the side of the shell; the end of the pipe is submerged. Your committee has no recommendation to make in regard to any particular location where the water is to be delivered to the boiler, as any of the above arrangements seem to give entire satisfaction.

AUXILIARY DOME OR MANHOLE Cover to Facilitate Interior Inspection of Boiler.—One member advises that they provide an auxiliary dome, or manhole, for interior inspection of boiler. The size of manhole is 15 ins. in diameter, located a short distance ahead of the back flue sheet. This is submitted for your consideration, as it makes inspection of the interior of the boiler possible without removing the throttle standpipe and dry pipe. One member is using larger dome in new construction to accomplish the same result.

SURFACE BLOW OFF COCKS.—Three members use surface blow off cocks. One of these members has discontinued the use of same, the other two members using surface blow off cocks have located them on a line with the second gauge cock, and advise that they get good results from the use of both the blow off cock and surface blow off cocks by getting rid of the mud

and scale by blowing the boilers regularly.

LOCATION OF BLOW OFF COCKS.—We find there is no uniform practice in regard to the location of blow off cocks. Two members advise that they use four or more, which are located one in the throat sheet, one or more in the side water legs, depending upon the size of the boiler, one in the belly of the boiler near the throat sheet, and in some cases additional blow off cocks in the belly of the boiler at the centre. One of these members advises it has been found by using a sufficient number of blow off cocks and insisting upon their use at regular intervals the amount of boiler washing has been cut down considerably, as well as giving greater life to the flues. Another member advises that they have been ex-

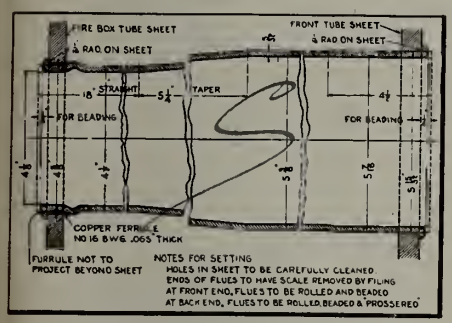


Fig. 32.—Method of Setting Superheater Tubes.

perimenting with the blow off system, by which one blow off cock in the throat sheet draws mud from along the mud ring and the barrel of the boiler by means of slotted pipes, and this has worked out satisfactorily in service. Some of the members favor locating the blow off cock right above the mud ring and another locates them about one foot up from the mud ring.

Your committee has no recommendation to make in regard to the number or where the blow off cocks should be located. The number and location of blow off cocks depends on the quality of water used.

FILLING OF BOILERS.—One member advises that they have had a number of side sheets cracked by filling through blow off cocks located in the water legs. They did not state whether they used cold or warm water. They are now filling through the blow off cocks located in the barrel of the boiler. Another member advises that they have had considerable experience with sheets cracking from the filling through blow off cocks with cold water. They now fill boilers through injectors when using cold water.

It seems to be the consensus of opinion of the members that it is most advisable to fill the boilers from the blow off cocks in the water leg, providing warm water is used. If cold water is used it should be filled through the valve on top of the boiler or through the injectors, and your committee recommends that this practice be followed out.

WASHING OUT AND FILLING UP OF Locomotive Boilers.—The reports regarding washing out and filling up of locomotive boilers and the use of blow off cocks were so at variance with what is generally considered good practice, your committee would strongly recommend the appointment of a special committee to report thereon.

LOCATION OF FITTINGS.—Gauge cocks and lower column cock should be located so that they will not come directly back of gusset plate or stay angles, and not to be located directly over arch tubes.

Figs. 3 and 4 show the type of boiler used by one of the members from an anthracite road, which is submitted for your consideration.

For the consideration of the members of the Association in this report you will find a tabulated statement showing the different sizes of fireboxes, as well as a number of tubes and size of cylinders that the different members reported as giving good service for passenger, freight and switching service.

Additional illustrations are given on pages 548 and 549.

Suggestions and Deductions From Steel Passenger Cars.

By A. Copony, Chief Draughtsman, Car Department, G. T. R., Montreal.

The first portion of this article was given in Canadian Railway and Marine World for October.

COST AND WEIGHT.

The cost of any type of steel car will depend on the type of car, the seating capacity, the inside finish, the equipment, insulation, etc., but we must not forget that the cost of a car built of a certain material, in this case steel, will be in a sense direct proportionate to the weight of the car, and for this reason the selection of the type of the car will be of utmost importance. The selection of an economical type of section which combines the greatest strength, not forgetting shear, with the least area, will naturally keep the weight of the car body within certain desirable limits.

The avoidance of a great number of differently pressed parts will also have a definite bearing on the price of the car, and if we have to consider that a light car (avoiding, of course, extremes which would impair the life of the car for length of service), is in two ways desirable from the railway standpoint, the first being initial cost and the second and most important point being that the hauling expenses per car will diminish, despite the fact that the traction force per ton will increase for light weight cars. For this reason we are showing in the diagram that the weight of a car is also of interest to the motive power department. In the tables giving the details of steel passenger cars a column shows the dead weight of car per passenger, and although this value is fluctuating we will have to admit that it ought to be within reasonable limits for certain classes of cars.

In looking back upon the history of transportation we find that a horse drawn carriage will weigh about 1,500 to 2,500 lbs., seating at an average four passengers and a driver, which brings the dead weight per passenger from 300 to 500 lbs. This vehicle will move at a speed of 6 to 8 miles an hour over a roadbed not comparable to the worst kind of railway track. An automobile, weighing 5 tons, seating 7 passengers, and containing its own power plant, moving with almost the same average speed as a passenger train over a far inferior roadbed compared to a track, will bring the dead weight per passenger to 1,428 lbs. The dead weight per passenger of a steel railway car amounts to from 1,200 to 1,700 lbs., and admitting the points of superior comfort and safety to be balanced by the poor roadbed and the weight of the power plant of automobiles we must ask the question: "Is there no possibility of getting below the automobile limits of dead weight per passenger, and is this reduction possible without sacrificing safety and comfort?" The possibility to obtain better results is certainly within our grasp and it is a matter of application to attain better results with the superior material we employ in the construction of the car today compared to the inferior bulky material of the wooden cars of yesterday.

DRAFT RESISTANCE.

Until quite recently it has always been our aim to meet the natural demand for faster and larger trains, with an increase in power and speed developed by our locomotives, until we have pretty nearly reached the limit by the natural limitations of the grate surface. The next step to take to prepare for further demands for further increase of speed or length of train, would naturally be the reduction of draft resistance per ton of dead weight.

Draft resistances are made up in the main of air or skin resistance, friction resistance in the bearings, flange friction resistances, rolling friction resistances between wheels and rails, power losses caused by unbalanced wheels, and last, but decidedly not least, slip.

Flange friction resistances are to a certain extent avoidable, rolling friction resistances between wheels and rails are unavoidable and a reduction of this resistance cannot as yet be considered possible, although there are some products on the market that claim to overcome this trouble of flange friction resistances to a certain extent. The power losses by unbalanced wheels, although small, could be avoided and the effect of unbalanced wheels on tires shall be here entirely neglected.

Next in importance is the question of skin friction or air resistance. Leaving all theories of wave lines for passenger trains unconsidered, the following theory is advanced by scientists: A smooth surface offers more resistance, in form of skin friction, to an air current than a comparatively rough surface, because air is held in the cavities of the rough surface for a certain length of time, thus only permitting

SWITCH ENGINES

RAILROAD	SIZE OF CYLINDER INCHES	BOILER PRESSURE POUNDS	LENGTH OF FIRE BOX INCHES	WIDTH OF FIRE BOX INCHES	DEPTH OF FIRE BOX FRONT INCHES	DEPTH OF FIRE BOX BACK INCHES	NO OF FLUES	SIZE OF FLUES INCHES	LENGTH OF FLUES	DIA OF BOILER AT FIRST COURSE INCHES	GRATE AREA SQ FT	HEATING SURFACE OF FIRE BOX SQ FT	HEATING SURFACE OF TUBES SQ FT	FLUE HEATING SURFACE FIRE BOX HEATING SURFACE	TOTAL HEATING SURFACE GRATE AREA	FLUE HEATING SURFACE GRATE AREA	FIRE BOX HEATING SURFACE GRATE AREA	30 FT OF 13 PER EACH CU FT OF TOTAL CYL VOL	FUEL	ESTIMATED
S	19 x 24	180	71⅛	34⅜	72⅛	71⅛	213	2	14-0	58	17	117	1552	13.3	98.1	91.4	6.8	212	BIT. COAL	
M	19 x 26	180	108⅛	42	64⅛	61	260	2	14-6	65	31.5	152.1	2343	15.4	79.2	74.5	4.83	292	"	
G	19 x 26	175	108	40½	69⅛	60⅜	237	2	11-6	65	30.2	140	1417	10.1	51.6	46.9	4.6	182		
E	19 x 26	175	108	40½	64⅛	60⅛	237	2	15-0	63⅜	30.2	158.4	1860	14.3	66.0	61.7	4.3	233	"	○
P	20 x 26	180	108⅛	90¼	47	34	259	2	11-7⅞	62⅞	67.7	150.6	1572	10.4	25.4	23.2	2.2	182.5		
O	20 x 26	190	38	40⅜	69¼	67	264	2	12-9½	66	27.4	148	1772	11.95	70.1	64.7	5.4	203	"	
C	20 x 26	180	108⅛	42	68⅜	65⅜	280	2	11-0	66½	31.5	152	1600	10.5	55.6	50.8	4.82	205	"	
B	20½ x 26	180	120	41	71	64½	311	2	11'-0"	68⅝	34.1	194	1798	9.27	58.4	52.7	5.7	201.5	"	
Q	21 x 26	200	84	66	76	74	400	2	11'-0"	80	38.5	169	2286	13.5	63.8	59.4	4.38	240		
F&N	21 x 28	180	72⅛	65½	69⅜	67⅛	304	2	16'-0"	66½	32.6	136.9	2703	19.78	87.2	83	4.13	252.9		○
M	22 x 24	205	90	66	62½	55½	325	2	11'-0"	67½	41.25	155	160047	10.3	42.6	38.8	3.76	166	"	
A	20 x 26	180	72	78	57	57	300	2	13'-4"	63	39	143	2112	14.8	57.8	54.2	3.67	238	"	
T	18 x 24	180	82	40⅜	70	67	199	2	11'-10	60⅛	22.99	122.9	1224	9.96	58.6	53.3	5.34	183	"	

Passenger Locomotives.—Dimensions of Fireboxes Reported as Giving Good Service.

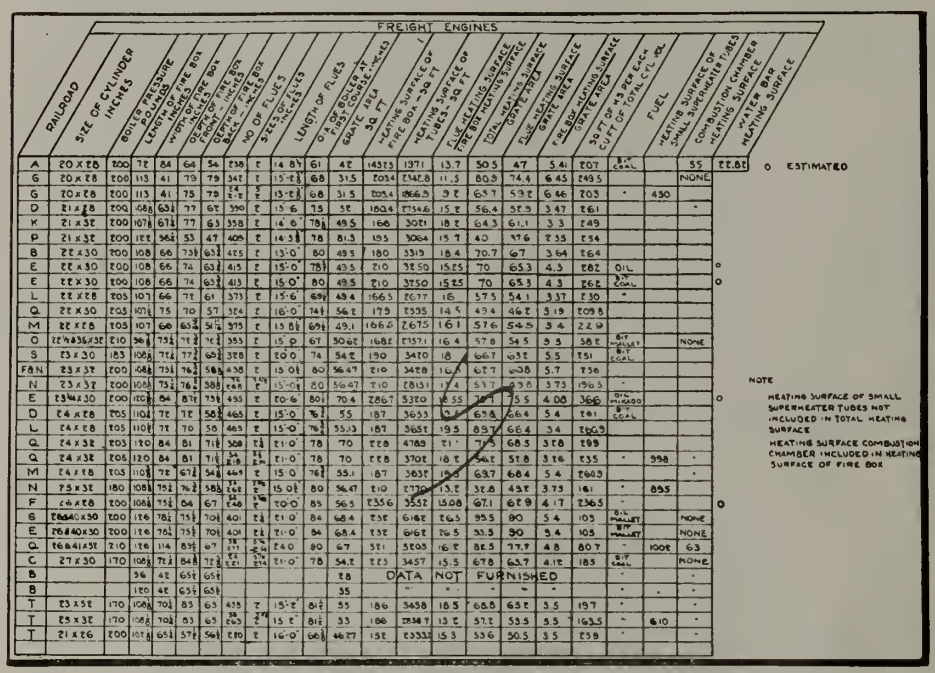
the high spots of the surface to hit the passing air, and as the friction between air and air is less than between air and a smooth solid body the resistance of rough surfaces is smaller. It would be worth while to put this theory to a practical test on railways, but it is a question if it could be used to advantage, since a rough surface offers better opportunities for dust and soot to settle and cling to the car, and is harder to dislodge in the cleaning yards, than from smooth surfaces, some advantages could be derived in the general appearance of the car, since it is impossible to prevent slight buckles with even the very best of care and the use of so-called "patent level" material, which are shown up by a glossy coat of varnish, which defect could be effectively covered by the use of a dull finished surface.

Bearing friction, one of the main factors of train resistance, is one of the points that was apparently neglected until quite recently. We must concede, of course, that a lot of improvements have been made in the use of antifriction metals, but the main issue, the conversion of gliding friction into rolling friction, which would signify a conwas conceded that the results derived from roller bearings were favorable when the cars were run at low speed, the draft resistance at higher speeds was increasing rapidly and exceeded in some cases that of gliding friction bearings. As to these objections much can be said that will put the roller bearing in a more favorable light for consideration.

Heat treatment of special high grades of steel, and the use of vanadium in the manufacture of steel, has made the rollers tougher and harder, so that they can be subjected to higher pressures with impunity.

End thrust bearings were designed to take care of the end thrust of axles, and it can be only a question of time and experiments until a roller bearing for cars will be evolved that will meet all requirements, so that the saving in drawbar pull will more than counterbalance the extra expense of roller bearings.

Experiments were made by Prof. W. P. Graham, of Syracuse university, in 1905, in which the merits of roller bearings were clearly demonstrated by the power consumption of electric street cars equipped with roller bearings and without roller



Freight Locomotives.—Dimensions of Fireboxes Reported as Giving Good Service.

siderable reduction in draft resistance, has been woefully neglected. I am sure that this neglect, or rather the lack of interest shown in taking this matter up for high class passenger rolling stock has had many reasons that could serve as an excuse. Excluding ball bearings entirely, the reasons held against the application of roller bearings were the high pressures to which rollers were subjected to, the complication of design and the high initial cost of the bearings, the possibility of an absolute locking of axle, if one of the rollers should break, and the danger resulting therefrom to the passengers, the difficulty of repairs, the end thrust that has to be taken care of, and a lot of other objections of lesser importance.

Several leading railways of the country carried on experiments in years gone by, but the result was in many instances not encouraging. The pressures on the rollers, made of impure and not properly hardened steel, were excessive, the rollers broke, the wear was excessive where pressures had exceeded a certain limit, so that the application of roller bearings was confined to light rolling stock only, and although it bearings. These experiments showed a saving of power of about 50% by the use of roller bearings, compared to gliding friction bearings of the old type. As the testing facilities must have been of a crude kind, no definite information was given regarding the power consumption per ton mile at varying speeds, the speeds being in every case below 25 miles an hour, so that not many deductions can be drawn from this test. No special test was made to show why the resistance of roller bearings should increase more rapidly after attaining a certain speed limit than gliding friction bearings, and although we can surmise that this is caused by the crowding of rollers, which thus set up a gliding friction among themselves, taking place at double the circumferencial speed of one roller, we have no confirmation by test. The use of, and experiments with, roller cages would be advisable, because they are designed to prevent such a state of affairs. Further provisions will have to be made to prevent accidents in case of breakage of rollers, and special care will have to be taken to make the journal as dust tight as possible. That the roller bearing has been a success in all those places where the power is limited has been proven by the use of these roller bearings in harvesting machinery, and this is still more surprising since we know that the working conditions of agricultural machinery are worse than those of a truck in motion.

One other factor in making up our drawbar resistance is slip. The percentage of slip is varying and increases with the difference in diameters of mated wheels on one axle. Although all our railway shops pay special attention to this fact, when they are turning new or repaired passenger equipment out of their shops, it is impossible to maintain equal diameters for any reasonable length of time, since the difference in finish of cut, material, carbon percentage, hardness, etc., are different in every wheel and in every brakeshoe, so that the best diameter balance will be upset in the shortest time. To investigate the amount of slip in actual service and the increase in drawbar pull necessitated by these gliding friction losses at high pressure would be highly interesting, the more so since the drawbar pull alone is only one factor that is mentioned here. The wear on tires and rails must be excessive, since the pressure per square inch of contact between wheel and rail is very high.

To prove this assertion the following figures, based on a theoretical modulus of gliding friction of 0.75 between steel and steel for exceptionally high pressures per square inch and without lubrication, are set down.

The assumption is a train, consisting of 6 cars of 60 tons weight each, the diameter of wheels differing ¼ in., and the train being carried a distance of one mile. The foot pounds of drawbar pull to move a train at a speed of 45 miles an hour, with a pull of 17 lbs. per ton, is equal to:

$17 \times 6 \times 60 \times 5280 = 32{,}313{,}600$ ft. lbs.

Revolutions of axle with a standard 36 in. wheel per mile=

$$\frac{5280}{3.1415 \times 3} = 559 \text{ revolutions per mile.}$$

Slip per revolution in inches=0.25×3.14159 =0.785 inches.

$$\text{Total slip in ft. per mile} = \frac{0.785 \times 559}{12} = 36.56 \text{ ft.}$$

$$\text{Friction loss in ft. lbs.} = \frac{36.56 \times 6 \times 120000 \times 0.75}{2}$$

=9, 875,000 with load of train.

The friction loss in ft. lbs. with load of train is, therefore, equal to 30.5% of the total drawbar pull.

These figures are, of course, only based on theoretical assumptions, and are used to point a way to investigate one of our heaviest power losses. There is no donbt that the percentage of this resistance will change materially with the speed of trains and weight of cars, and further we maintain that the bulk of flange wear is caused by this difference in diameter of tires, since there is always a lot of play between journal box and journal brass, which permits a constant twisting of the axle, caused by the afore-mentioned forces, which results in the tendency to climbing of flange on rail.

The tronhle of slip could be overcome by the application of individual wheels to the truck, or simpler still by the use of sleeve shafts. It would be going too far to advocate the application of this principle, for which a practical solution will have to be found to our present day trucks, but the time will come some day, when the reduction of draft resistance will become imperative, and if we could find means of reducing our draft resistance some 50 to 75% it would mean that we could haul

just twice as many cars at the same speed we are using today without any increase in power.

INSULATION.

The insulation of steel cars is, in the general opinion of most car builders, one of the few points that have been seriously neglected in the past, and of which it can not be said that an effective solution has been applied as yet to suit our Canadian climatic conditions, but there is no cause that could prevent the solution in an effective way. As has been pointed out previously the method of insulation depends primarily on the extreme weather conditions of those parts of the country in which a certain car will be used. Heat will be transmitted by one or more or all of the three phenomena, conduction, convection, and radiation. The conduction of heat in all steel passenger cars will be naturally far higher than in wooden cars, the more so since the material in steel cars is far thinner than in wooden cars, the coefficient of conduction of the two materials comparing like 24: 0.17 or 141: 1. The losses of heat through convection would be about the same in steel and wooden cars, but the losses through radiation would be naturally greater in steel cars, since more heat is transmitted by means of conduction to the outside surface of the steel car.

Luckily, however, we have means of checking the losses by radiation and conduction to a marked degree in a lot of the composite materials put on the market for this purpose. The selection of a proper insulation material is made hard by the fact that no scientific investigations into the conductivity of these composite materials are available which would aid the car builder in his task. In order to cut the loss of heat by conduction the employment of entirely closed air cells of small dimensions is suggested, the latter being built up of poor conductors of either organic or inorganic origin on basis of the principle of hollow tiles.

The process of applying insulating material to the inside and outside shell of steel cars gives poor results, since it is practically impossible to prevent the leakage of air into the large air cells between the insulations, and between the insulation and the outside or inside finish. In those cases where the application of the inside finish has to be done direct to the steel structure of the car, like carlins and posts, the use of an intermediate porous material like corkstone, asbestos, or magnesia, is recommended to reduce losses through conduction, the method of fastening the latter being a matter of design and experiments only. Even the application of light wooden strips, although better conductors than corkstone, would be recommended for the ease of applying by means of bolts inserted in keyhole slots of the posts and carlins.

INSIDE FINISH.

The question of inside finish is considered in most cases as a matter of appearance only, but, nevertheless, the proper selection of inside finish material should be based on results of experimental investigation.

The objections to wooden inside finish for steel passenger cars are weight, combustibility, splintering in case of wreckage, and warping, and there is the possibility of trouble caused by the different expansion of the outside and inside shell of cars. The use of steel for inside finish of steel passenger cars has also its disadvantages, foremost of which is high conductivity, poor resistance to denting by baggage, on account of thinness of material, the possibility of condensation, and rusting of finish from the inside out, and some minor disadvantages like buckles and dents which show up after finish has been varnished and painted. The combination of wood and steel has been attempted by several railways for inside finish, consisting in the application of veneer to steel by means of a binder direct, or by means of an intermediate material to receive a binder, but to my knowledge these experiments have been more or less of a failure on account of the different expansion of materials like wood and steel. I do not see why wood should be combined with steel, if not for the only reason of reducing weight and the prevention of splintering in case of wreckage, for the reduction of conductivity by the application of veneers is small and does not count from the standpoint of insulation. The best material for inside finish would be sheets that combine poor conductivity with small weight, fireproof properties and a certain amount of resistance to destruction, and I think that several or all of these properties can be found in many of the composite materials made by different concerns for ceiling finish, of material like asbestos, wood pulp, or other vegetable or mineral bases made fireproof or semi-fireproof and homogenous by different patent processes. Before using any of the composite materials exclusively it will be necessary to carefully ascertain the properties of conduction, fire resistance and resistance against rotting, the latter only where the basis of the sheets is of vegetable or animal matter.

The manner of applying inside finish is also of great importance. Inside finish for steel passenger cars should be easily removable, and easily appliable to cars after they have once been fitted, so that it will be possible to inspect the insulation and the condition of the framing at least once a year for the first two or three years after the car is put in service.

HEATING AND LIGHTING.

The construction of the steel passenger car has only very little bearing on the lighting system, be this either gas or electric, and the heating system has also been solved, or nearly solved, for the wooden car, and is, therefore, directly appliable to the steel car, with the possible exception of a necessarily increasing heating capacity to take care of the bad insulation losses of some of the present day steel passenger cars.

VENTILATION AND SANITATION.

These are matters bearing in the same measure on wooden cars as on steel cars, so that there is no particular necessity to treat the subject at all, these points being only inserted for the sake of completing the diagram at the beginning of this paper.

The latest orders of different state laws in the U. S., issued outside of the Interstate Commerce Commission rulings, bearing on sanitation, disinfection, common drinking cups, drinking water tanks, etc., are affecting all types of passenger cars and are therefore omitted.

In summing up the foregoing, railways or contractors taking the purchase or sale of steel passenger cars under advisement should investigate the merits of the turtleback type of car over the monitor type and look into means and ways of reducing the weight and drawbar pull of this equipment, thus bringing cars to a higher economic efficiency than in the past.

The foregoing paper was read before the Canadian Railway Club in Montreal recently.

PASSENGER ENGINES

Railroad	Size of Cylinder Inches	Boiler Pressure Pounds	Length of Fire Box Inches	Width of Fire Box Inches	Depth of Fire Box Front Inches	Depth of Fire Box Back Inches	No. of Flues	Size of Flues Inches	Length of Flues	Dia. of Boiler at First Course Inches	Grate Area Sq. Feet	Heating Surface of Fire Box Sq. Feet	Heating Surface of Tubes Sq. Feet	Fire Heating Surface Sq. Feet	Total Heating Surface Sq. Feet	Fire Box Heating Surface Grate Area	Fire Box Heating Surface Grate Area	50 Ft. of H.S. per Each Cu. Ft. of Total Cyl. Vol.	Fuel	Heating Surface of Small Superheater Tubes	
K	18 x 28	200	108	32	68	65	297	2	11-0	64 1/4	23.5	157	1322	10.9	80	73.3	6.68	2275	Bit. Coal		
P	19 x 26	210	108 1/2	90 1/4	48	38	280	2	13-10	67 3/8	67.76	150.6	2044.5	13.6	32.4	30.2	2.3	254	Hard Coal		
K	19 1/2 x 28	200	120	96	54 3/4	47 1/4	333	2	11-4	69 3/8	80	180	1887	10.5	25.8	23.6	2.25	214	Bit. Coal		
E	20 x 28	200	108	66	68	64	297	2	16-0	68 3/8	49.5	201	2490	12.4	54.4	50.3	4.07	264	Oil		
E	20 x 28	200	108	66	68	64	297	2	16-0	70	49.5	201	2490	12.4	54.4	50.3	4.07	264	Bit. Coal		
P	20 1/2 x 26	210	122 1/2	96 3/4	48	40	310	2	16-6 1/2	68	81.63	174	2664	15.3	34.8	32.6	2.73	286	Hard Coal		
M	20 1/2 x 26	205	111	72	61 1/8	55 5/8	315	2	15-0	65	55.5	166	2474	14.9	47.6	44.5	2.99	266	Bit. Coal		
B	22 x 26	200	114	66	74 1/4	65 3/4	316	2 1/4	19-6	74	52.2	199	3636	18.6	73.4	69.6	3.7	334	"		
L	22 x 26	205	111	72	68	65	315	2	15-0	65 3/4	55	166	2474	14.9	48	45	3.02	230	"		
Q	22 x 26	205	111	72	73	64	247	2 1/4	15-0	69	55.5	173	2180	12.6	42.4	39.3	3.12	205	"		
T	22 x 26	180	102 1/8	65 1/4	74 1/2	60 1/2	302	2	20-0	64 1/8	46.5	175.4	3144.9	17.9	71.5	67.8	3.77	290	Bit. Coal Anthr. Coal		
N	22 x 28	200	108 1/2	75 1/2	82	65	382	2	20-0	70 1/2	56.4	231.3	3982	17.2	74.5	70.7	4.1	340	Bit. Coal		
N	22 x 28	200	108 1/2	75 1/2	82	65	78 2 1/4	5 1/16 2	21-5 1/2	70 1/2	56.4	231.3	3560	15.4	67.2	63.2	4.1	307	"	1085.7	
G	22 x 28	200	108	66	68	64	248	2 1/4	20-0	70	49.5	180	2475	13.7	53.6	50	3.64	215	"		
O	22 x 28	200	97 1/2	76	63 1/2	50 1/2	305	2	20-7	70 1/2	50	169	3340	19.7	70.1	66.8	3.38	284	"		
S	22 x 28	185	108 1/2	72 1/2	77 1/4	69 1/2	309	2	20-6	66	54.2	190	3303	17.4	64.5	61	3.5	283	"		
T	23 x 28	200	108 1/2	70 1/4	81 1/2	68	388	2	20-0	70 1/2	53	209	4085.7	19.3	80.3	76.3	3.94	315	Bit. Coal Anthr. Coal		
T	23 x 28	170	108 1/2	70 1/4	81 1/2	68	70 2	5 5/16 2 1/4	20-0	70 1/2	53	209	3018.1	14.4	61	56.9	3.94	239	"	691	
A	23 x 28	180	88	84	65 1/2	60 1/8	196	5 1/16 2	18-0	70	51.2	163	2588	15.9	53.8	50.5	3.2	204	Bit. Coal	605	
J	23 x 30	190	108	71 1/2	77	62	317	2 1/4	21-0	74	54	192	3903	20.3	75.8	72.3	3.55	284	"		
N	23 1/2 x 26	200	108 1/2	75 1/2	82	65	78 2 1/4	5 1/16 2	21-6	70 1/2	56.4	231.3	3560	15.4	67.2	63.2	4.1	290	"	1086	
F	23 1/2 x 26	200	108 1/2	75 1/4	82	65	175 2 1/4	5 1/16 2	20-6	83	56.4	221	2619	11.85	50.3	46.4	3.92	218	"		
L	24 x 26	205	111	72	79	66	359	2 1/4	21-0	78	55	1993	4440	22.3	84.3	80.8	3.62	341	"		
M	24 x 26	205	110	72	77 1/8	57 1/8	350	2 1/4	21-0	78	55	1993.2	4420.6	22.2	83.9	80.3	3.62	339	"		
Q	24 x 32	205	120	84	81	71 1/2	218	2 1/4	21-0	78	70	228	3702	16.2	56.2	53	3.26	235	"		
C	25 x 28	165	108 1/2	72 1/4	74 3/8	61 1/8	70 2	5 1/16 2 1/4	21-0	70	54.2	200	2829	14.13	55.8	52.5	3.69	190.5	"		
G	26 x 28	200	120	84	92 1/2	73 1/2	495	2	20-6	82	70	235	5324	22.6	79.5	76	3.36	323	"		
E	27 x 28	200	124	37 1/4	79	75	355	2	15-0	63	32.1	193	2790	14.4	93	87	6.02	161	Oil		

o ESTIMATED.

NOTE
HEATING SURFACE OF SMALL SUPERHEATER TUBES NOT INCLUDED IN TOTAL HEATING SURFACE.

Switching Locomotives.—Dimensions of Fireboxes Reported as Giving Good Service.

The Transit as an Improvised Tunnel Instrument.

By G. W. McDougal, Kansas City, Kan.

There is a special instrument already on the market for measuring the cross section of tunnels. However, for short tunnels few railways are accustomed to furnish it, leaving the engineer in charge to measure his tunnels as best he can. On tunnel 3, of the Idaho Northern Ry., the regular transit with a vertical arc was converted into what answered for a tunnel instrument, by simply attaching a narrow piece of a wooden straight edge 3 ft. long, to the lower part of the barrel of the telescope and making it parallel with the line of sight of the transit.

When the vertical angle becomes too great to permit looking through the transit itself, the tape is stretched tight from the point in the tunnel roof to the axis of the transit. The three feet straight edge brought parallel to the tape will, to all practical purposes, set the transit on the line of sight for the point in the roof, enabling the correct vertical angle to be read. The vertical angle and distance for each consecutive point enables the area of the resulting triangles (and consequently the entire cross section of the tunnel) to be calculated direct.

It is announced that the Grand Trunk Pacific Ry. hotel in Edmonton, Alta., is to be named the Macdonald, after the late Sir John A. Macdonald.

Canadian Pacific Railway Co.'s Annual Report and Meeting.

Following is the 31st annual report, addressed to shareholders over the signature of the President, Sir Thos. G. Shaughnessy:—

The accounts for the year ended June 30 show the following results:—

Gross earnings		$123,319,541.23
Working expenses		80,021,298.40
Net earnings		$ 43,298,242.83
Net earnings of steamships in excess of amount included in monthly reports		1,104,448.79
		$ 44,402,691.62
Deduct fixed charges		10,524,937.49
Surplus		$ 33,877,754.13
Deduct amount transferred to steamship replacement account	$1,000,000.00	
Contribution to Pension Fund	125,000.00	
		1,125,000.00
		$ 32,752,754.13
From this there has been charged a half-yearly dividend on preference stock of 2%, paid April 1	$1,258,333.32	
And three quarterly dividends on ordinary stock of 1¾% each, paid Jan 2, April 1 and June 29	$9,450,000.00	
		$ 10,708,333.32
		$22,044,420.81
From this there has been declared a second half-yearly dividend on preference stock, payable Oct.	$1,333,901.94	
And a fourth quarterly dividend on ordinary stock of 1¾% payable Oct. 1	$3,150,000.00	
		$ 4,483,901.94
Leaving a net surplus for the year		$17,560,518.87

In addition to the above dividends on ordinary stock 3% was paid from special income.

DETAILS OF SPECIAL INCOME FOR YEAR.

Balance at June 30, 1911	$2,702,205.20
Interest on cash proceeds and on deferred payments for land sold	1,817,774.37
Interest on deposits and loans	605,140.21
Interest on C.P.R. 1st mortgage bonds acquired	61,612.00
Interest from Minneapolis, St. Paul & Sault Ste. Marie Ry. bonds	159,720.00
Interest from Duluth, South Shore & Atlantic Ry. bonds	100,000.00
Interest from Mineral Range Ry. bonds	50,160.00
Interest from Toronto, Hamilton & Buffalo Ry. bonds	10,840.00
Interest from Kingston & Pembroke Ry. bonds	13,320.00
Interest from Dominion Government bonds	182,500.00
Interest from Ontario Government bonds	48,000.00
Interest from British consols	114,569.44
Interest from Montreal & Atlantic Ry. bonds, and on other securities	174,311.88
Dividends on St. John Bridge & Ry. Extension Co. stock	50,000.00
Dividends on Dominion Express stock	160,000.00
Dividends on M. St. P. & S.S.M. Ry. common stock	890,645.00
Dividends on M. St. P. & S.S.M. Ry. preferred stock	445,326.00
Dividends on Alberta Ry. & Irrigation Co. stock	245,241.50
Dividend on West Kootenay Power & Light Co. common stock	27,500.00
Dividends on W. K. P. & L. Co. preferred stock	1,925.00
	$7,860,790.60
Less—Payments to shareholders in dividends: Sept. 30, 1911; Jan. 2, Apr. 1 and June 29, 1912	5,400,000.00
	$2,460,790.60
From this a dividend has been declared, payable Oct. 1	1,350,000.00
Leaving net surplus carried forward	$1,110,790.60

The working expenses were 64.89% of the gross earnings, and the net earnings 35.11%, compared with 64.77 and 35.23% respectively in 1911.

Four per cent. consolidated debenture stock for £2,252,516 was created and sold, and of the proceeds £1,481,592 was applied to the construction of branch lines; £300,000 for acquisition of steamships for Pacific coast service; £5,000 to acquire a like amount of your company's first mortgage 5% bonds; and the balance £465,924 was devoted to the acquisition of the bonds of other railway companies whose lines constitute a portion of your system, the interest of which had been guaranteed by your company. Four per cent. preference stock for £1,976,390 was created and sold, the proceeds being used to meet capital expenditures.

Your guarantee of interest was endorsed on 4% consolidated bonds of the M. St. P. & S.S.M.R. Co. for $1,520,000, issued and sold to cover the cost of 76 miles of railway added to that company's system.

During the year 669,639 acres of agricultural land were sold for $10,710,143, an average of $15.99 an acre. Included in this area were 3,270 acres of irrigated land, which brought $44.25 an acre, so that the average price of the balance was $15.85 an acre.

Your directors consider it desirable to extend the following branch lines of railway in Manitoba, Saskatchewan and Alberta, and will ask you to sanction the issue of the requisite amount of 4% consolidated debenture stock to meet the expenditures, viz.:—Boissevain to Lauder, 37 miles; Weyburn-Lethbridge branch, 125 miles; Kerrobert northeasterly branch, 11 miles; Wilkie-Anglia branch, 4 miles; Swift Current northwesterly branch, 80 miles; Suffield southwesterly branch, 55 miles.

There will be submitted for your consideration a lease of the Kingston and Pembroke Ry., extending from Renfrew, on the company's main line west of Ottawa, to Kingston, and from Godfrey to Zanesville mine, Ont., 107.5 miles; a lease of the Alberta Central Ry., extending from Red Deer to Rocky Mountain House, Alta., 65 miles; an agreement with the St. Marys and Western Ontario Ry. Co. cancelling existing arrangements and substituting a lease of its property for 999 years at a rental equivalent to 4% per annum on bonds issued or to be issued by that company with your consent to an amount not exceeding $25,000 a mile of its railway; and a deed of conveyance of the Cap de la Madeleine Ry., about 4 miles, connecting your railway near Three Rivers, Que., with Cap de la Madeleine, on the St. Lawrence river, and with the Wayagamack Pulp and Paper Co.'s works.

A lease from the New Brunswick government of the New Brunswick Coal and Ry. Co. for 999 years at a rental of 50% of the net earnings, as defined in the proposed lease, will be submitted for your sanction This railway extends from the vicinity of Minto to a junction with the Intercolonial Ry., near Norton, N.B., approximately 58 miles, and will form a portion of a connection between your railway and a coal mine in New Brunswick, now in process of development.

For the purpose of securing a shorter and more expeditious route between Quebec and points in New England, served by your friendly connection the Boston and Maine Rd., your directors thought it advisable to lease the Quebec Central Ry., forming the connection between Sherbrooke and Levis, together with branch lines from Beauce Jct. to St. Sabine, and from Tring to Megantic, Que., a total of about 253.5 miles, at a rental based upon the interest on the outstanding 1st, 2nd and 3rd mortgage bonds of the Q.C.R. Co., and a dividend on the outstanding capital stock of that company at 4% per annum for four years from July 1, 1912, and thereafter at 5% per annum, and you will be asked to confirm and sanction the lease.

The Shuswap and Okanagan Ry., from Sicamous Jct., on your main line in British Columbia, to the head of Okanagan lake, 51 miles, was leased to your company on its completion in 1892 for 25 years, and it was a condition that the company should pay by way of rental 40% of the gross earnings of the line in quarterly amounts. The interest on the bonds issued by the S. & O. Ry. Co. for construction, amounting to £10,000 per annum, was unconditionally guaranteed by the province of British Columbia. Until within the last two years the rental was insufficient to meet the annual interest charge, with the result that the province had a deferred claim against the S. & O. R. Co. for the deficiency in interest amounting to about £80,000 at the end of last fiscal year. As the principal of the bonds will mature July 1, 1915, and it is manifestly desirable that your company should retain possession of the line, a lease of the property for 999 years has been arranged and will be submitted for your approval. The rental to be paid by your company is an amount equivalent to 4% per annum on the outstanding bonds of the company and on any that may hereafter be issued with your consent. Upon being subrogated in the rights of the province your company has undertaken to make good to the province the deficiency in interest, to which reference has been made.

Your land in British Columbia secured by the construction of the Columbia and Western and British Columbia Southern Rys., had, by lapse of time and judgment of the court, become subject to taxation. Of the lands in these grants 434,696 acres were sold during the past 12 years at an average price of $1.77 an acre. As these constituted the most accessible of the lands, and the remainder were so situated that they would necessarily be very slow of sale, your directors decided after negotiations covering a considerable period to reconvey to the province the unsold portion of these two land grants, excepting an area of 543,496 acres, reserved by the company to meet its timber and tie requirements, at the price of 40c an acre. This will enable the provincial authorities to encourage settlers to take up on very easy terms such of the lands as may be of use, and the company will be relieved from the cost of administration and from the payment of rather heavy annual taxes. Your directors are of opinion that the transaction, which was not completed until after the close of the fiscal year, will prove advantageous to both the province and your company, and they hope that their action will meet with your approval.

The Georgian Bay and Seaboard Ry., recently built under the auspices of your company between Victoria Harbor, on Georgian Bay, and Bethany, Ont., to provide a shorter and more economical lake and rail route between western Canada and the Atlantic seaboard, has proved more expensive than was anticipated, due to the character of the line that it was finally determined to construct and to other conditions. The power conferred by Parliament on the G.B. & S. Ry. Co. to issue bonds for the purpose of its undertaking was originally limited to $30,000 a mile, but at the last session this was increased to $55,000 a mile, and your directors will ask your authority to enter into a supplementary agreement with the G.B. & S. Ry. Co. to increase the limit of that company's bond issue, upon which this company has, by virtue of the lease approved Oct. 3, 1906, agreed to pay interest by way of

rental, from $30,000 to an amount not exceeding $55,000 a mile of railway.

Instead of continuing the double track from Glen Tay to Agincourt, on the Ontario and Quebec Ry. between Montreal and Toronto, your directors have decided, if you approve, to secure a line between these two points that will serve the territory further south, and will reach several important towns on the north shore of Lake Ontario. An agreement has, therefore, been made with the Campbellford, Lake Ontario and Western Ry. Co. for the construction, under your company's supervision and control, of that company's railway, 184 miles, between Glen Tay and Agincourt, and for the lease of the railway when completed to your company for 999 years, at a rental equivalent to 4% per annum on the bonds of the C.L.O. & W. Ry. Co., issued with your consent.

Your present route between points in the Kootenay and Boundary Creek districts, B.C., and the Pacific coast is long and expensive, and the best means of securing a more direct route has engaged the attention of your directors for some time past. The Kettle Valley Ry. Co., having a Dominion charter, covering the territory between Midway, the terminus of your Boundary Creek line, and Merritt, on your Nicola line, undertook to build the railway between these points, under the advice and to the satisfaction of your directors, upon condition that your company would lease the line, approximately 270 miles, and the branch line along the north fork of the Kettle river, 24 miles, as soon as the K.V. Ry. Co. is competent to make a lease, paying by way of rental the interest at 4% per annum on the bonds of the K.V. Ry. Co., issued with your consent, any subsidy received from the Dominion or Provincial Government, or from any other source, to be applied on an agreed basis towards the cost of the construction of the railway and a corresponding reduction in the amount of bonds to be issued. This line will give you access to a large and important section of the province in which development should quickly follow railway facilities. Your directors will suggest that they be clothed with power to make an agreement of lease when the requisite legal formalities have been complied with.

The amounts appropriated for new works, exclusive of railway construction, were abnormally large, in the year under review. For the enlargement of terminals, additional buildings, shops, second tracks, sidings and improvements of every variety calculated to improve the efficiency of your railway system, and to facilitate the movement of your large and increasing traffic, $30,000,000 was authorized to be expended and orders for locomotives and cars, representing an expenditure of $25,750,000, were placed. Many of these works cannot be completed within the season with the limited amount of labor available, but your directors are sparing no effort to meet the convenience of the public and to strengthen your own position. Canadian manufacturers of freight cars are very much behind in their deliveries, but they promise to do better, and there is little doubt that all of the equipment ordered abroad will be forwarded according to contract.

In 1905, when your company acquired the Esquimalt and Nanaimo Ry., you also purchased the unsold lands on Vancouver Island belonging to that company, about 1,400,000 acres, for $1,330,000. Thus far 250,000 acres have been sold, yielding $3,364,000, and the remaining area is of great value, although some portions of it are so situated that they cannot well be utilized. There was the possibility that these lands might be subject to taxation if segregated from the Esquimalt and Nanaimo Ry., and, therefore, they have never been taken into your accounts, but an agreement about taxes has been made with the province, and hereafter the figures relating to them will appear in your annual statements.

At a special general meeting of shareholders, May 11, 1892, a resolution was adopted authorizing the company to create and issue from time to time consolidated debenture stock payable in sterling money of Great Britain and bearing interest not exceeding 4% per annum for the purpose of satisfying or acquiring mortgage bonds of any other railway company, the principal or interest of which the company shall have already guaranteed. The Dominion Atlantic Ry. Co., whose railway you have leased, provided its money requirements by an issue of three classes of debenture stock, upon which your company has guaranteed the payment of the annual interest as a consideration for the lease of the property. It is quite likely that in the future it will be found desirable to acquire a portion, or all, of this debenture stock by an issue of your own 4% consolidated debenture stock, and, in order to comply strictly with the provisions of the act of 1892, it will be necessary to have an issue of consolidated debenture stock for that purpose approved by the shareholders at the special general meeting duly called for the purpose immediately after the annual general meeting.

CONDENSED BALANCE SHEET.

Assets.

Railway and equipment		$382,809,051.33
Ocean, lake and river steamships		21,338,974.12
Acquired securities (cost)		80,525,353.32
Properties held in trust for the company		6,378,358.03
Deferred payments on land and town site sales		41,468,821.88
Advances to lines under construction		16,654,401.70
Advances and investments		12,360,997.99
Material and supplies on hand		13,017,431.90
Current Assets:		
Agents and conductors balances	$4,805,132.07	
Miscellaneous accounts receivable	5,023,469.41	
		9,828,601.48
Temporarily invested in government securities		10,088,734.86
Cash in hand		33,628,819.03
		$628,119,545.64

Note.—In addition to above assets, the company owns 6,660,581 acres of land in Manitoba, Saskatchewan and Alberta (average sales past year $15.99 an acre), and 4,395,948 acres in British Columbia.

Liabilities.

Capital stock		$180,000,000.00
Payment on subscription to new issue capital stock ($18,000,000)		16,806,621.00
4% preference stock		66,695,007.03
4% consolidated debenture stock		153,823,706.86
Mortgage bonds:		
First mortgage, 5%	$34,998,633.33	
Algoma branch, 1st mortgage	3,650,000.00	
		38,648,633.33
Current liabilities:		
Audited vouchers	$11,361,277.06	
Pay rolls	5,621,929.55	
Net traffic balances	290,366.38	
Miscellaneous accts. payable	6,271,762.30	
		23,545,335.29
Interest on funded debt and rental of leased lines:		
Coupons due July 1, 1912, and including coupons overdue not presented	$1,207,274.00	
Accrued fixed charges	184,428.35	
		1,391,702.35
Equipment obligations		1,040,000.00
Equipment replacement fund		2,103,993.54
Steamship replacement fund		5,721,852.37
Appropriation for additions and improvements		3,535,712.14
Reserve fund for contingencies		4,382,617.80
Lands and town sites: sales		57,538,307.59
Surplus		72,885,966.34
		$628,119,545.64

FIXED CHARGES FOR YEAR

1st mortgage bonds 5% due July 1, 1915		$1,749,931.66
St. Lawrence & Ottawa Ry. 4% 1st mortgage bonds		38,933.34
Man. S. West. Colzn. Ry. 1st mortgage 5% bonds due June 1, 1934		127,200.00
Toronto, Grey & Bruce Ry. rental		140,000.00
Ontario & Quebec Ry. debenture stock 5%		975,129.56
Ontario & Quebec Ry. ordinary stock 6%		120,000.00
Atlantic & North West. Ry. 1st mortgage bonds due Jan. 1, 1937		323,633.34
Algoma branch 5% 1st mortgage bonds, due July 1, 1937		182,500.00
New Brunswick Southern Ry. 1st mortgage bonds, 3%		15,000.00
Lindsay, Bobcaygeon & Pontypool Ry. 1st mortgage bonds, 4%		20,000.00
Rental, Calgary & Edmonton Ry.		218,357.60
" Farnham to Brigham Jct.		1,400.00
" Mattawamkeag to Vanceboro		23,800.00
" New Brunswick Ry. system		372,829.74
" Terminals at Toronto		25,353.15
" Terminals at Hamilton		35,297.73
" Hamilton Jct. to Toronto		42,191.12
" St. Stephen & Milltown Ry.		2,050.00
" St. Marys & W. Ont. Ry.		2,442.05
" Joliette & Brandon Ry.		5,000.00
" Lachine Canal Branch		939.96
Interest on Montreal & Western Ry.		15,403.37
Interest on equipment obligations		63,066.67
4% Consolidated Debenture Stock.		
Interest from July 1, 1911	$5,935,482.62	
Interest from Jan. 1, 1912	96,995.58	
	$6,032,478.20	
Less received from subsidy Northern Colonization Ry.	8,000.00	6,024,478.20
		$10,524,937.49

EXPENDITURES ON CONSTRUCTION ACQUIRED AND BRANCH LINES.

Moose Jaw branch	$1,136,877.08
Craven-Bulyea branch	116,685.17
Virden-McAuley branch	94,395.77
Stonewall branch extension	2,876.53
Lauder branch	3,280.69
Weyburn-Lethbridge branch	787,295.34
Langdon branch	1,418.54
Kipp-Aldersyde branch	631,965.44
Bassano-Irricana branch	472,059.78
Regina-Colonsay branch	653,294.94
Estevan-Forward branch	284,577.39
Waldo-Galloway branch	141,606.89
Moose Jaw s.w. branch	581,539.79
Wilkie n.w. branch	474,079.73
Kerrobert n.e. branch	140,448.03
Wilkie-Anglia branch	262,597.68
Swift Current s.e. branch	727,620.68
Swift Current n.w. branch	645,679.44
Boissevain-Lauder branch	54,873.27
Suffield s.w. branch	49,550.64
Three Forks-Bear Lake branch	249,182.06
Surveys of projected lines	174,844.57
	$7,686,609.45

EXPENDITURE ON ADDITIONS AND IMPROVEMENTS.

MAIN LINE.

Quebec to Bonfield—		
Additional sidings, buildings, stations and yards	$ 233,450.00	
Permanent bridges and improvements of line	392,729.88	
Right of way	5,175.00	
		$ 631,354.88
Montreal terminals		16,25,820.23
Windsor St. station extension		839,331.42
Double track bridge over St. Lawrence river		816,749.29
Bonfield to Port Arthur—		
Additional sidings, buildings, stations and yards	189,957.02	
Permanent bridges and improvements of line	335,719.08	
Wharves, docks and warehouses	2,506.58	
Telephone dispatching equipment	232.89	
		528,415.57
Port Arthur to Field—		
Additional sidings, buildings, stations and yards	1,546,845.91	
Permanent bridges and improvements of line	519,322.14	
Winnipeg station and hotel	73.35	
Winnipeg terminals	877,045.20	
East Winnipeg yard	478,550.22	
Wharves, docks and warehouses	195.34	
Double tracking	1,507,953.97	
Right of way	7,424.13	
Calgary hotel	238,256.81	
		5,175,667.07

Field to Vancouver—		
Additional sidings, buildings, stations and yards	537,525.21	
Permanent bridges and improvements of line..	1,173,794.18	
Field Hill revision of line	Cr. 2,530.28	
Wharves, docks, and warehouses	Cr. 1,784.18	
Vancouver terminals	705,058.25	
Right of way	7,023.65	
		2,419,086.83
Total main line		$12,036,425.29

BRANCH LINES.

South Western branch	$ 15,509.07	
Stonewall branch	Cr. 549.90	
Selkirk branch	7,603.74	
Emerson branch	959.12	
Nakusp and Slocan branch	22,183.77	
Revelstoke and Arrow Lake branch	12,234.83	
Snowflake branch	131.34	
Waskada branch	Cr. 127.38	
St. Lin branch	2,654.62	
Lake Timiskaming branch	43,430.65	
MacGregor branch	2,618.32	
Mission branch	33,849.34	
Arcola-Regina branch	18,850.90	
North Star branch	7,876.15	
Lac du Bonnet branch	15,509.40	
Wolseley-Reston branch	1,334.42	
Lachine Canal branch	5,902.80	
Toronto-Sudbury line	213,748.23	
Pheasant Hills branch	308,984.62	
Souris branch—		
Additional sidings, buildings, stations and yards	211,068.53	
Permanent bridges and improvements of line	80,096.05	
Right of way	629.05	
Algoma branch—		
Additional sidings, buildings, stations and yards	17,340.28	
Permanent bridges and improvements of line	106,267.12	
Crowsnest Pass branch—		
Additional sidings, buildings, stations and yards	$ 83,193.40	
Permanent bridges and improvements of line	170,540.51	
Right of way	2,484.29	
	256,218.20	
Crowsnest pass branch—McLeod-Lethbridge deviation	4,281.81	
British Columbia Southern Ry.—		
Additional sidings, buildings, stations and yards	31,811.85	
Permanent bridges and improvements of line	120,323.54	
Right of way	895.65	
Balfour extension	5,788.17	
Yahk branch	6,960.59	165,779.80
		1,554,394.88
Telegraph extensions and additions		358,141.97
Office building, Toronto		456,540.76
Office building, Edmonton		222,457.23
Office building, Saskatoon		1,000.00
Office building, Victoria		125,209.00
Rented and temporary sidings		213,095.00
Total main line and branches		$14,967,264.13

EQUIPMENT AT JUNE 30.

Locomotives	1,820
First and second class passenger cars, baggage cars and colonist sleeping cars	1,841
First class sleeping, dining and cafe cars	369
Parlor cars, official and paymasters' cars	75
Freight and cattle cars (all kinds)	61,446
Conductors' vans	1,065
Boarding, tool and auxiliary cars and steam shovels	4,254

Ocean, lake and river steamships and steamboats:—Atlantic service, 16 vessels; Pacific service, 2; Pacific coast service, 24; upper lake service, 5; B.C. lake and river service, 21; Detroit river ferry service, 2.

RECEIPTS

Cash in hand, June 30, 1911		$ 34,371,550.98
Temporarily invested in Government securities		10,088,743.83
Surplus revenue	$32,752,754.13	
Special income	5,158,585.40	
		37,911,339.53
Land department—		
Land and townsites :		
Net proceeds of sales	8,279,537.17	
Collection of deferred payments on previous years' sales	6,028,524.87	
	14,308,062.04	
Less amounts remaining in deferred payments on year's sales	13,380,925.93	
		927,136.11
Bonuses :		
Dominion Government subsidy :		
Moose Jaw branch.	78,432.00	
Selkirk Branch—		
Gimli extension	30,176.00	
		108,608.00
Capital Stock :		
Subscription to $18,000,000 additional ordinary stock :		
Payments on instalments		16,806,621.00
4% preference stock :		
Amount realized from issue £1,976,390		9,444,080.19
Consolidated debenture stock:		
Amount realized from issue £2,252,516		11,016,661.59
		$120,674,732.26
Deduct—		
Advances to lines under construction.	16,654,401.70	
Advances and investments	12,360,997.99	
Current assets	9,828,601.48	
	38,844,001.17	
Less amount at June 30, 1911	26,684,005.17	
		12,159,996.00
		$108,514,736.26

EXPENDITURES.

Dividends on preference stock :		
2% paid Sept. 30,1911	$1,141,533.31	
2% paid April 1, 1912.	1,258,333.32	
		$ 2,399,866.63
Dividends on ordinary stock :		
2½% paid Sept. 30, 1911	4,500,000.00	
2½% paid Jan. 2, 1912	4,200,000.00	
2½% paid Apr. 1, 1912	4,500,000.00	
2½% paid June 29, 1912	4,500,000.00	
		18,000,000.00
Properties held in trust for the company		197,665.27
Construction of acquired and branch lines		7,686,609.45
Additions and improvements, main line and branches		14,967,264.13
Additions and improvements, leased and acquired lines		3,732,500.11
Rolling stock, shops and machinery		15,801,577.89
Ogden shops at Calgary		608,857.86
Ocean, lake and river steamships—		
Additional steamships and appurtenances for Pacific Coast service. $ 749,894.19		
Less sale of S. S. "Amur" 11,000.00		
	738,894.19	
Additional river steamers and barges	86,740.83	
Extension to S.S. Alberta	1,819.44	
Payments on account of steamships Empress of Asia and Empress of Russia	1,557,671.94	
Less amount paid from steamship replacem't	778,835.97	
	778,835.97	
Additional facilities at Liverpool, Eng.	62,260.15	
		1,668,550.58
Securities Acquired—		
Calgary & Edmonton Ry 1st mort. bonds	$2,200,000.00	
Kingston & Pembroke Ry. 1st mort. bonds.	254,637.50	
Shuswap & Okanagan 1st mort. bonds	4,767.07	
Tilsonburg, Lake Erie & Pacific Ry. 1st mort. bonds	67,500.00	
Alberta Ry. & Irrigation Co. stock	125,550.00	
Dominion Atlantic Ry. stock	10,183.06	
Kingston & Pembroke Ry. stock	1,099.25	
Shuswap & Okanagan Ry. stock	39,550.00	
West Kootenay Power & Light Co. stock	517,493.25	
Minneapolis, St. Paul & Sault Ste. Marie Ry.. Balance of subscription to ordinary and preferred stock.	1,324,920.00	
		4,545,700.13
Payment of equipment obligations		160,000.00
Increase in material and supplies on hand		1,826,177.89
		71,594,778.94
Deduct—		
Increase in current liabilities		6,797,596.57
		64,797,182.37
Temporarily invested in Government securities		10,088,734.86
Cash on hand		33,628,819.03
		$108,514,736.26

DESCRIPTION OF FREIGHT FORWARDED

FREIGHT TRAFFIC.

	1912	1911
Flour, barrels	8,459,850	8,469,744
Grain, bushels	151 731,691	111,169,982
Live stock, head	1,663,315	1,567,665
Lumber, feet	2,806,735,006	2,441,007,107
Firewood, cords	305,079	298,345
Manufac'd articles, tons.	7,196,225	5,759,344
All other articles, tons	9,092 821	8,971,037

FREIGHT TRAFFIC.

	1912	1911
No. of tons carried	25,940,238	22,536,214
No. tons carried 1 mile	10,311,650,965	8,032 102,013
Earnings pr. ton pr. mile	0.77 cts.	0.81 cts.

PASSENGER TRAFFIC.

	1912	1911
No. of passengers carried.	13,751,516	12,080,150
No. of passengers carried one mile	1,626,577,067	1,457,332,932
Earnings per passenger per mile	1.96 cts.	1.93 cts.

TRAFFIC STATISTICS

Earnings of lake and river steamers not included in TRAIN MILEAGE.

	1912.	1911.
Passenger trains	19,591,027	17,393,532
Freight trains	25,633,672	21,701,893
Mixed trains	1,727,792	1,680,421
Total Trains	46,957,511	40,775,846

CAR MILEAGE.

Passenger—		
Coaches and P.D. and S. cars	100,088,130	89,404,332
Combination cars	2,917,523	2,812,227
Baggage, mail and express cars	42,678,970	38,487,654
Total Passenger Cars	145,684,623	130,704,213
Freight—		
Loaded	556,244,798	460,739,921
Empty	140,210,180	139,455,186
Caboose	27,871,524	23,521,772
Total freight cars	724,326,502	623,716,879
Passenger cars per traffic train mile	6.83	6 85
Freight cars per traffic train mile	26.47	26.67

PASSENGER TRAFFIC

Passengers carried (earning revenue)	13,593,569	11,928,943
Passengers carried (earning revenue) one mile	1,610,251,856	1,440,649,164
Passengers carried (earning revenue) one mile per mile of road	149,549	139,297
Average journey per passenger miles	118.46	120.77
Average amount received per passenger $	2.30	2.31
Average amount received per passenger mile cts.	1.94	1.92
Average number of passengers per train mile	75.53	75.53
Average number of passengers per car mile	15.63	15.62
Revenue from passengers per passenger car mile c.	30.31	29.91
Total passenger train earnings per train mile $	1.75	1.73
Total passenger train earnings per mile of road $	3,471.85	3,191.71

FREIGHT TRAFFIC

Tons of revenue freight carried one mile	10,180,782,322	7,859,966,837
Tons of non-rev. freight carried one mile	1,615,529,852	1,241,451,628
Total tons (all classes) freight carried 1 mile	11,796,312,174	9,101,418,465
Tons of revenue freight carried one mile per mile of road	945,519	759,983
Tons of non-rev. freight carried one mile per mile of road	150,039	120,036
Total tons (all classes) freight carried one mile per mile of road	1,095,558	880,019
Average amount received per ton per mile of revenue freight cts.	0.772	0.819
Average tons of revenue freight per train mile	372.02	336.16
Average tons of non-rev. freight per train mile	59.03	53.09
Average tons of (all classes) freight per train mile	431.05	389.25
Average tons of revenue freight per loaded car mile	18.30	17.06
Average tons of non-rev. freight per loaded car mile	2.91	2.69
Average tons of (all classes) freight per loaded car mile	21.21	19.75
Freight train earnings per loaded car mile cts.	14.13	13.97
Freight train earnings per train mile $	2.87	2.75
Freight train earnings per mile of road $	7,298.71	6,222.86

STATEMENT OF PENSION DEPARTMENT TO JUNE 30.

Balance at June 30, 1911	$670,487.46
Amount contributed by company for year	125,000.00
Amount received as interest	39,582.24
	$835,069.70
Payment of pension allowances for year	149,655.38
Balance in cash and investments	$685,404.32

NUMBER ON PENSION ROLL AT JUNE 30.

Under 60 years of age	64
Between 60 and 70 years of age	269
Over 70 years of age	204
Total	537

Sir Thos. Shaughnessy, in submitting the report for approval, said:—

The report covers the most prosperous year in the company's history, the gross operating income having exceeded $123,000,000, and the net balance, after providing for fixed charges and making the usual deductions, being $33,752,000.

Regarding the crops in Western Canada, there is the prospect that they will be larger than estimated and of particularly good quality. The weather conditions and shortage of farm help interfered with threshing, and the movement of grain to the markets will crowd transportation facilities towards the close of lake navigation. We hope to escape anything in the nature of serious congestion, and have reason to expect that the grain traffic and the general business of the company during next year will be at least as large as it was last.

A second main line is being laid between Regina and Chaplin, Sask., and by the end of 1914 the double track should be completed and in use between Fort William and Calgary, 1,256 miles. The extension of the second track from Calgary to Revelstoke, where the line crosses the mountain ranges, will require careful investigation and study before a plan of operation can be determined, but a double track through this territory is urgently required to meet the demands of traffic, and no time will be lost in the commencement and prosecution of the work. Among other important works in hand are a second main line between Farnham and Montreal junction, including the replacement of the bridge across the St. Lawrence river at Lachine, by a double track structure designed for the heaviest train loads; a large sorting yard for freight trains at Montreal junction; the Windsor street passenger terminal at Montreal, that will be finished about the end of the year and will provide more than twice the present station and yard accommodation; the warehouses and yards for local traffic that are being constructed on the government house and adjoining properties acquired in Toronto; the additional freight yards at Transcona, five miles east of Winnipeg, where about 400 acres are being covered with tracks and buildings to supplement the existing Winnipeg yards, among the largest in the world, but insufficient to accommodate the traffic at that point; the large locomotive and car shops at Ogden, near Calgary, which will be ready for use in the course of the next three or four months; and the new station, overhead bridges and wharf facilities at Vancouver that it will take some time to complete. Innumerable other works of lesser importance, but involving a large expenditure, all designed to facilitate traffic and to accommodate the public, have been executed or are in process of execution, and there would appear to be no limit to the demands of this kind that it will be necessary to meet if our business continues to expand as it has in the past.

The most prudent and effective method of providing money for all these purposes has the close and constant attention of your directors and they believe that in the future, as in the past, the best interests of the company and of Canada will be served by giving an opportunity to the shareholders to furnish the additional capital on a basis that makes the investment reasonably attractive. With the 4% consolidated debenture stock that your Directors are now authorized to issue and sell, the proceeds to be used in retiring outstanding bonds carrying a higher rate of interest, and in meeting expenditures for additional railway mileage heretofore constructed or acquired, and the consolidated debenture stock that may be issued in respect of the proposed construction or acquisition of the several railway lines described in the report, there will be approximately $90,000,000 4% consolidated debenture stock, in excess of all heretofore disposed of, that the company will be authorized to issue and sell. Instead of going to the market with any considerable portion of this amount, your directors recommend that you make use of the authority conferred upon you by Parliament to issue ordinary shares of capital stock in lieu of consolidated debenture stock, and that you increase your ordinary share capital from $200,000,000 to $260,000,000 to be offered to shareholders at $175 for each $100 share, at a time and on terms of payment to be fixed by your directors. The proceeds to the amount of $60,000,000 will be used to meet expenditures for which proceeds of consolidated debenture stock would otherwise have been utilized, including the satisfaction and cancellation of all the company's outstanding 5% first mortgage bonds, amounting to $33,766,000, on or before their maturity, July 1, 1915, and the balance will be devoted to such additions and improvements to the property, properly chargeable to capital account, as are in the opinion of your directors necessary from time to time. By this means the company will be getting money on its ordinary share capital at a low rate of interest, taking the present dividend rate as a basis, its bond and debenture debt will be $60,000,000 less, its fixed charges will be $2,400,000 per annum less than they otherwise would have been, and its available funds for the purposes of the undertaking will be increased by $45,000,000. Your directors will recommend that this amount be supplemented by an appropriation of $15,000,000 from your accumulated surplus, that might properly be distributed to the shareholders but that will instead be expended on capital account in additions and improvements to your property.

The report was unanimously adopted.

It was resolved, that the construction and equipment of the following branch lines and extensions which have been authorized, be approved:—

An extension northeasterly of the Kerrobert northeasterly branch, 11 miles;

An extension westerly of the Weyburn-Lethbridge branch, 100 miles, and easterly from near Stirling on the A.R. & I. Co.'s line, 25 miles;

An extension southeasterly of the Wilkie-Anglia branch, 4 miles;

An extension northwesterly of the Swift Current northwesterly branch, 80 miles;

A branch from Boissevain westerly to near Lauder and known as the Boissevain-Lauder branch, 37 miles;

A branch southwesterly from Suffield, on the main line and known as the Suffield southwesterly branch, 55 miles.

And for such purpose to issue consolidated debenture stock not exceeding £6,000 a mile for the Kerrobert northeasterly branch extension, Wilkie-Anglia branch extension, Swift Current northwesterly branch extension, Boissevain-Lauder branch and Suffield southwesterly branch, and £5,000 a mile for the Weyburn-Lethbridge branch extensions.

Resolutions were also adopted, approving the lease of the Kingston and Pembroke Ry., for 999 years, at an annual rental equal to the interest payable on the outstanding mortgage debentures, until they have been redeemed, and interest at 4%, payable half yearly upon other securities which the K. &. P. Ry. Co. may issue at the request of the lessees, the aggregate securities not to exceed $10,000 a mile of railway;

Approving the lease of the Alberta Central Ry., for 999 years, at an annual rental equal to the interest payable on all bonds carrying interest not exceeding 4% per annum, payable half yearly, which the lessors may issue at the request of the lessees;

Cancelling the existing lease of the St. Marys and Western Ontario Ry., and approving a new lease for 999 years, at an annual rental equal to the interest payable on all bonds carrying interest not exceeding 4% per annum, which the lessors may issue at the request of the lessees, the aggregate of such bonds outstanding not to exceed $25,000 a mile of line built or under contract;

Approving the purchase of the Cap de la Madeleine Ry.;

Approving the lease of the New Brunswick Coal and Ry. Co.'s railway, for 999 years, at an annual rental of 50% of the net earnings of the line;

Approving the lease of the Quebec Central Ry. for 999 years, at an annual rental equal to 4% per annum on the outstanding first mortgage debenture stock; interest at 3½% on the second mortgage debenture stock; interest at 5% per annum on the third mortgage bonds; a dividend of 4% per annum on the outstanding capital stock for four years, from July 1, 1912, and thereafter at 5% per annum, and interest on any bonds or debenture stock which the lessors may issue at the request of the lessees;

Authorizing the lease of the Shuswap and Okanagan Ry. for 999 years, at an annual rental equal to the interest payable on the present outstanding bond issue, $1,250,000, at 4% per annum, and on all bonds carrying interest at 4% per annum which the lessors may issue at the request of the lessees, the aggregate of all such bonds not to exceed $35,000 a mile of railway built or under contract;

Approving the sale to the British Columbia government of lands of the British Columbia Southern Ry.'s land grant, and the Columbia and Western Ry.'s land grant, at 40c. an acre, reserving 543,496 acres of the B.C. Southern Ry. land grant and all timber on lands covered by timber permits in force at the date of the agreement; releasing the provincial claim for taxes on the B.C. Southern Ry. land grant, and approving payment to the province of amounts advanced for payment of interest on Shuswap and Okanagan Ry. bonds, after crediting amounts received by the province from the company's earnings, the province releasing both companies from all liability to pay any portion of the company's earnings, or interest on the company's bonds; the province also to sell to the company, the Kaslo and Slocan Ry., in consideration of $25,000, the company to rebuild, maintain and continuously operate same and the province to pay the company a cash subsidy of $100,000;

Approving a supplementary agreement increasing the bond issue of the Georgian Bay and Seaboard Ry from $30,000 to $55,000 a mile;

Approving the lease of the Campbellford, Lake Ontario and Western Ry. for 999 years, at an annual rental equal to the interest payable on all bonds carrying interest not exceeding 4% per annum, which the lessors may issue at the request of the

lessees, the aggregate of such bonds not to exceed $65,000 a mile of line built or under contract;

Authorizing lease of the Kettle Valley Ry. at an annual rental equal to the interest payable on all bonds bearing interest not exceeding 4% per annum, which the lessors may issue at the request of the lessees, the aggregate of such bonds not to exceed $50,000 a mile for the Coquihalla branch, and $40,000 a mile for other lines;

Authorizing the issue of consolidated debenture stock, not exceeding £1,232,500, for the acquirement of the first, second and extension debenture stock of the Dominion Atlantic Ry., which has been leased for 999 years, and

Authorizing the increase of the C.P.R. Co.'s capital stock from $200,000,000 to $260,000,000.

The retiring directors, W. D. Matthews, Sir Sandford Fleming, A. R. Creelman and Sir William Whyte, were re-elected.

At a subsequent meeting of the board, Sir Thos. G. Shaughnessy was re-elected President; D. McNicoll, Vice President, and the following were appointed the executive committee:—R. B. Angus, D. McNicoll, Sir Edmund Osler, Sir Thos. Shaughnessy, Lord Strathcona and Sir William Van Horne.

Canadian Ticket Agents' Association's Annual Meeting.

The 26th annual meeting of this association was held at the Chateau Laurier, Ottawa, Ont., Oct. 9.

The Right Honorable R. L. Borden delivered an address of welcome. F. W. Churchill, C.P.R., Collingwood, Ont., replied on behalf of the association.

The President, S. B. Morris, C.P.R., Rodney, Ont., occupied the chair and in his opening address referred among other things to the loss the association had sustained in the death of M. McNarama, G.T.R. agent at Walkerton, Ont., and a past President of the association.

E. de la Hooke, Secretary-Treasurer, read his annual report, the best in the association's history, showing a membership of 218 and there being a balance of $386.76 on hand.

C. E. Benjamin, General Tourist Agent, C.P.R., Montreal, representing the American Association of Passenger Agents, addressed the meeting and referred to the warm welcome and attention given by the Canadian government to immigrants.

J. A. McKenzie, G.T.R., Woodstock, Ont., reported his attendance as representative of the association at the American Association of General Passenger and Ticket Agents' convention at Seattle, where he was successful in obtaining the appointment of a committee to take up with the Interstate Commercial Commission the question of the granting of free transportation once a year on railways in the United States to members of the association.

A Hilton, General Passenger Agent, St. Louis and San Francisco Rd., was unable to come to Ottawa as representative of the American Association of General Passenger and Ticket Agents, owing to illness.

A letter was read from Barlow Cumberland, a past President, expressing his regret at his inability to be present.

A. E. Duff, District Passenger Agent, G. T.R., Toronto, read a very practical paper in which he dealt with filing tariffs and circulars, displaying advertising matter, public time tables, etc.; newspaper advertising; through ticketing and exchange orders; ticketing children, and soliciting travel.

An amendment to the constitution was introduced by the President, S. B. Morris, to admit as associate members district travelling or general agents of the passenger departments of Canadian railways and steamship lines and similar officials resident in Canada of any foreign lines. The amendment was defeated.

The following officers were elected for 1913:—President, G. J. Alexander, G.T.R., Richmond, Que.; First Vice President, J. Kidd, C.P.R., Goderich, Ont.; Second Vice President, C. B. James, C.P.R., Orillia, Ont.; Third Vice President, J. A. McKenzie, G. T.R., Woodstock, Ont.; Secretary-Treasurer, E. de la Hooke, London, Ont.; Auditors, A. M. Hare, Wabash Ry., Tilsonburg, Ont. Executive Committee:—W. Jackson, C.P.R., Clinton, Ont.; F. W. Churchill, C. P.R., Collingwood, Ont.; W. McIlroy, C.P. R., Peterboro, Ont.; C. E. Horning, G.T.R., Toronto, Ont.; J. F. Dolan, R. & O. Navigation Co., Montreal, Que. There were 119 members and 97 ladies in attendance.

H. W. Baker, Publicity Commissioner, Ottawa, and S. J. Montgomery, City Freight and Passenger Agent, Canadian Northern Ry., Ottawa, were presented with coffee

P300 G. J. Alexander,
President Elect, Canadian Ticket Agents' Association.

percolaters as tokens of the association's appreciation for looking after the members' comforts during the meeting.

While the business meeting was going on the ladies were taken by members of the local committee to the Parliament buildings, mint, etc., and in the afternoon were given a ride around the city, visiting Rockcliffe park and Britannia on the Bay. In the evening there was an at home at the Chateau Laurier.

On the morning of Oct. 10, the members were entertained to a trip on the steamboat Victoria by Capt. F. Elliott, and in the afternoon the Experimental Farm and Dominion Observatory were visited. In the evening the party were entertained at the theatre.

T. Thauburn, C.P.R. ticket agent, Brampton, Ont., as in previous years, sent a large box of roses and carnations to Ottawa, to be distributed to the ladies of the party.

On October 11, the party left by G.T.R. special train for Montreal and were guests for tea on the Donaldson liner Saturnia. In the evening they boarded the White Star Dominion Line s.s. Laurentic and left early next morning for Quebec as guests of the line.

During the trip to Quebec, a presentation was made to Capt. Mathias of the Laurentic, and P. W. G. Mitchell, Passenger Manager, first cabing department, White Star-Dominion Line was given a coffee percolator.

The multiplicity of details in connection with the arrangements for the meeting, transportation of members, etc., were most admirably carried out by Secretary de la Hooke.

Railway Finance, Meetings, Etc.

Boston and Maine Rd.—The shareholders have authorized the issue of 106,637 shares of common stock, and a bond issue of $7,500,000. The new issue will be used to pay off money borrowed for buying certain railways in Massachusetts; and to improve the line, provide additional equipment, etc.

Cap de La Madeleine Ry.—See Canadian Pacific Ry.

Canada Atlantic Ry.—Following are the officers and directors elected for the current year:—President, E. J. Chamberlin; Vice President, H. G. Kelley; Secretary-Treasurer, F. Scott; other directors, W. Wainwright, J. E. Dalrymple, R. S. Logan and W. H. Biggar.

Canada and Gulf Terminal Ry.—The annual meeting was held at Montreal, Oct. 4. Following are the officers and directors for the current year:—President, M. J. O'Brien; Vice President, H. J. Lyons; Secretary-Treasurer, F. W. Rous; Traffic Manager, Rene Dupont; other directors, G. A. Cote, J. A. Ross, D. Caron, C. A. Gauvreau and J. A. O'Brien.

Canadian Northern Ry.—A prospectus of £2,057,612 ($10,000,000) 5% income charge convertible debenture stock was issued in London, Eng., Sept. 25, the issue price being 106. Between Jan. 1, 1916, and Jan. 1, 1919, this stock may be converted at the holder's option into common stock. A London cablegram says that the underwriters had to take 77% of the issue, owing to the unfavorable market conditions.

Cape Breton Coal, Iron and Ry. Co.—A meeting of the holders of the 5% gold bonds is to be held in London, Eng., Nov. 6, to consider a resolution approving an extraordinary resolution as defined in article 8 of the mortgage deed.

Canadian Northern Western Ry.—There has been filed with the Provincial Secretary at Edmonton, Alta., a trust deed and mortgage made by the C.N.W. Ry. to the British Empire Trust Co., and National Trust Co., as trustees, and the Province of Alberta securing 30-year 4% guaranteed debenture stock or bonds on certain lines in Alberta. The C.N.W. Ry. Co. is a subsidiary of the Canadian Northern Ry. Co., which is building branch lines under provincial guarantee of bonds in Alberta.

Canadian Pacific Ry.—The Board of Railway Commissioners is being asked for a recommendation to the Governor-in-Council for the sanction of leases to the C.P.R. of the following lines:—Alberta Central Ry. (under construction); Campbellford, Lake Ontario and Western Ry. (under construction); Cap de La Madeleine Ry.; Kingston and Pembroke Ry.; St. Marys and Western Ontario Ry.

Central Ry. of Canada.—Application has been made to list £222,500 fives on the London, Eng., stock exchange.

Central Vermont Ry.—The report for the year ended June 30 shows:—gross receipts, $4,435,832.21; operating expenses, $3,419,

312.40; net operating revenue, $1,016,519.81; less taxes, $150,000, net debit from rentals, $16,887.63; hire of equipment debit, $177,495.23; fixed charges, $718,276.90; total deductions, $1,062,659.76; credit parlor cafe car service, $5,372.92; and interest on securities held by company, $53,720; net result, $12,952.97. The property was well maintained during the year and $1,136,465.70 was spent on improvements, of which $22,569.40 was paid out of operating expenses. Of the balance, which was charged to capital account, $1,090,839.72 was for new equipment, and on this account $980,000 of 5% equipment trust notes were issued, which will be retired at the rate of $98,000 each year. Special reference was made to the death of C. M. Hays, Chairman of the company, the board's resolution expressing appreciation of his services to the company having been sent to Mrs. Hays. The officers and directors for the current year are:—Chairman, E. J. Chamberlin; President, E. H. Fitzhugh; Vice President and Attorney, C. W. Witters; General Manager, G. C. Jones; other directors, E. C. Smith, W. S. Webb, J. W. Stewart, J. G. McCullough, E. H. Baker, S. E. Kilner, A. Tuttle, C. P. Smith and E. L. Marston.

Dominion Atlantic Ry.—Approximate passenger earnings for Sept., $63,405.36; freight earnings, $56,067.94; total earnings, $119,473.30, against $165,200 total earnings for Sept., 1911.

Esquimalt and Nanaimo Ry.—There has been deposited with the Secretary of State at Ottawa, copy of a lease, dated July 1, of the line to the C.P.R.; and also copy of a mortgage made between the E. & N. Ry., the Royal Trust Co. and the C.P.R.

Great North West Central Ry.—An action has been started by J. B. Delap, on behalf of himself and shareholders of this company against the company, the C.P.R., Sir Thos. G. Shaughnessy and R. B. Angus, to recover $300,000 in lieu of 300 shares of stock alleged to be controlled by him, and for an indemnity for allowing the lapsing of the company's charter for building a line to Battleford, Sask.

Kingston and Pembroke Ry.—See Canadian Pacific Ry.

Klondike Mines Ry.—Following are the officers and directors elected for the current year:—President, H. B. McGiverin; Vice President, J. P. Ebbs; Secretary, A. Haydon; other directors, J. Latta and C. G. Kekewich.

Lake Superior Corporation.—The annual meeting was held Oct. 2. Following are the officers and directors for the current year,—President, T. J. Drummond; Vice Presidents, J. T. Lea, W. K. Wigham and J. F. Taylor; other directors, W. E. Stavert, D. C. Newton, J. T. Terry, jr., F. McOwen, H. M. Price, H. Coppell, J. S. Dale; Secretary, T. Gibson.

Minneapolis, St. Paul and Sault Ste. Marie Ry.—During September press reports stated that the company was about to acquire the Wisconsin and Michigan Ry., and to this report we gave an official denial in our last issue. An officer of the company wrote us: "We have not, and do not intend to purchase this railway." Daily papers during October again stated that the M. St. P. & S.S.M.R. had purchased and was about to take over the Wisconsin and Michigan Ry., including the company's docks at Chicago.

Ottawa Terminals Co.—Following are the officers and directors elected for the current year:—President, E. J. Chamberlin; Vice President, H. G. Kelley; Secretary-Treasurer, F. Scott; other directors, W. Wainwright, M. M. Reynolds, R. S. Logan and W. H. Biggar.

Pacific Great Eastern Ry.—The adjourned annual meeting was held at Victoria, B.C., Oct. 15. Following are officers and directors for the current year,—President, J. W. Stewart; Vice President and General Counsel, D'Arcy Tate; Vice President, T. Foley; other directors, D. MacLeod and V. W. Smith.

Quebec Central Ry.—The annual meeting of shareholders was held in London, Eng., Oct. 16. The report showed that the development of traffic from the recent extension had been satisfactory. There had been a slight decrease in foreign traffic, and it was stated that an increase of about $35,000 a year in wages was anticipated. Increased expenditure would also have to be undertaken for additional siding accommodation, and when the Quebec bridge was completed a large capital expenditure would be necessary for branch lines in order to meet competition in fast train service. The resolution confirming the lease of the company's property to the C.P.R., was passed unanimously. J. H. Walsh, General Manager, Sherbrooke, Que., was present at the meeting.

Sluswap and Okanagan Ry.—In connection with the taking over of the land grants to the B.C. Southern Ry., and the Columbia and Western Ry. by the British Columbia Government, the C.P.R. agreed to repay to the province $401,000 which had been paid by the latter, under its guarantee, as interest on the S. and O. Ry. bonds. The transaction was completed recently.

St. Marys and Western Ontario Ry.—See Canadian Pacific Ry.

Temiscouata Ry.—Gross earnings for Aug., $23,320; expenses, $16,234; net earnings, $7,086. Aggregate net earnings for two months ended Aug. 31, $16,027.

Thousand Islands Ry.—The annual meeting was held at Deseronto, Ont., Sept. 30. Following are the officers and directors for the current year:—President, E. W. Rathbun, Deseronto, Ont.; Manager, J. F. Chapman, Gananoque, Ont.; Secretary and Treasurer, H. W. Cooper, Gananoque; other directors, B. R. Hepburn, M.P., and S. C. Lee.

Victoria and Sidney Ry.—The annual meeting was held at Victoria, B.C., Oct. 9. Following are the officers for the current year:—President, A. H. McNeill, Vancouver; Vice President, F. Brown, Seattle, Wash.; Secretary-Treasurer, A. M. Thomas.

The Victoria and Sidney Ry. Co. has offered to pay to the city of Victoria, B.C., $36,000, in respect of the amounts the city has been called upon to pay on account of its guarantee of interest of the company's bonds, and to indemnify the city against any future liability on account of the guarantee of the bonds. The city and the province guaranteed $300,000 of the company's bonds, the city guarantee being to an amount of $9,000 a year and the provincial guarantee being $6,000 a year. The city has been called to provide this $9,000 since the guarantee was given in 1893. The bonds mature in 1917. The company also offers to pay the province $20,000 and to indemnify it against any further claims under the guarantee. After discussing the matter on Oct. 1 the city council declined to accept the offer.

White Pass and Yukon Route.—Gross earnings for eight months ended Aug. 31, $738,739, against $691,760 for same period 1911.

Railway Rolling Stock Notes.

The Hart-Otis Car Co. has ordered from the Canadian Car and Foundry Co. three Rodger distributing ploughs.

The Algoma Central and Hudson Bay Ry. has ordered one all steel snow plough from the Canadian car and Foundry Co.

The recent press report that the Canadian Northern Ry. had ordered 2,000 box cars, in Hamilton, Ont., is, we are officially advised, erroneous.

The Grand Trunk Pacific Ry. has recently received from the Montreal Locomotive Works, six switching locomotives, nos. 400, 401, and 406 to 409; seven Pacific type locomotives, nos. 1100, and 1109 to 1114; and 25 consolidated locomotives nos. 845 to 869.

The combination second class and baggage cars, 11 of which have been ordered by the Canadian Northern Ry. from the Preston Car and Coach Co., will have 72 ft. bodies, wheel with crucible steel centres and tires, McCord journal boxes, Gold car heating equipment, oil lamps, Susemihl side bearings, P.C. & C. Co.'s standard seats, birch finish and cast steel bolsters.

The Canadian Northern Ry. between Sept. 15 and Oct. 15, ordered the following rolling stock,—30 ten wheel locomotives (light) and 30 ten wheel locomotives (heavy), from the Montreal Locomotive Works; 25 first class cars, and 10 baggage cars, from the Canadian Car and Foundry Co.; 25 second class cars from the Crossen Car Co.; and 11 combination cars, from the Preston Car and Coach Co.

The Intercolonial Ry. has ordered 100 Hart Convertible ballast and construction cars, and 50 all steel Otis type, bottom drop door, coal cars, from the Hart-Otis Car Co. The ballast cars will be of the 1912 design, 40 tons capacity, 36 ft. 8 ins. long by 8 ft. 8 ins. wide inside, and will be built with special removable tops for coal service when not required for ballasting. They will be built by the Canadian Car and Foundry Co.

The Canadian Northern Ry., between Sept. 15 and Oct. 15, received the following rolling stock,—9 locomotives from the Canadian Locomotive Co.; 1 locomotive from the Canada Foundry Co.; 1 first class car, 1 baggage car, 223 box cars and 1 dining car, from the Canadian Car and Foundry Co.; 2 combination cars from the Preston Car and Coach Co.; 5 baggage and mail cars from the Crossen Car Co.; 3 box cars from the Nova Scotia Car Works.

The G. T. R. has recently ordered the following rolling stock,—25 mikado locomotives, from the American Locomotive Co., Schenectady, N.Y.; one locomotive crane and one wrecking crane, in the U. S.; and has received the following additions to rolling stock,—2 baggage cars, from its Montreal shops; 43 refrigerator cars, 324 box cars, from the Canadian Car and Foundry Co.; 99 box cars, 31 steel coal cars, 81 automobile cars, 1 locomotive crane and 1 wrecking crane, from the U. S.

The Intercolonial Ry., between Sept. 11 and Oct. 15, ordered the following rolling stock,—750 thirty ton steel underframe box cars, 100 forty ton steel underframe platform cars, 20 thirty ton refrigerator cars, and one 8,000 gallon steel underframe tank car, from the Canadian Car and Foundry Co.; 100 forty ton Hart convertible ballast cars and 50 fifty ton Otis type all steel dump cars, from the Hart-Otis Car Co., to be built by the Canadian Car and Foundry Co.; 250 thirty ton steel underframe box cars and 50 thirty ton wooden box cars, from the Nova Scotia Car Works; 3 baggage cars, from the Preston Car and Coach Co.; 5 consolidation freight locomotives, from the Canada Foundry Co., and 120 thirty ton

wooden box cars, to be built at the I. R. C. shops at Moncton, N.B.

The C. P. R., between Sept. 14 and Oct. 14, ordered the following rolling stock,—6 freight refrigerator cars, 23 stock cars, 1 first class car, 23 flat cars, 83 vans, 8 baggage and express cars, 2 superintendents' business cars, 1 fruit express car, 5 locomotives, class U3, 10 locomotives, class G2, 1 flanger, 2 double track snow ploughs, 1 double track flanger, 524 wooden box cars, 8 locomotives, class P1, 2 horse express cars, 1 compartment sleeping car, 1 baggage and express car, and 2 mail and express cars, to be built at its Angus shops; 1124 steel frame box cars, 15 tourist cars, 10 first class cars, 20 baggage and express cars, 263 ballast cars, from the Canadian Car and Foundry Co.; 15 locomotives, class N3, 30 locomotives, class G2, 75 locomotives, class P1, and 10 locomotives, class D10, from the Montreal Locomotive Works; 10 locomotives, class N3, from the Canada Foundry Co.; 1 Jordan ballast spreader, from F. H. Hopkins and Co.; 30 sleeping cars, from the Pullman Co.; 30 sleeping cars, from Barney and Smith Co.; 247 steel frame box cars, from the Standard Car Co.; 85 5 steel frame box cars, from the Western Car and Foundry Co.

Following are chief dimensions, etc., of the class U3 locomotives, which the C.P.R. is building at its Angus shops, as mentioned in our last issue:—

Weight on drivers	137,000 lbs.
Driving wheels, diar.	52 ins.
Wheel base	11 ft. 6 ins.
Wheel base, engine and tender	41 ft. 3¼ ins.
Cylinders, diar. and stroke	18 by 26 ins.
Valves, type and diar.	Piston, 11 ins.
Valve gear	Walschaert
Axles, main and others	8½ by 10 ins.
Axles, tender	5 by 9 ins.
Boiler, type	Straight top
Boiler pressure	200 lbs.
Heating surface, firebox	138 sq. ft.
Heating surface, tubes	1406 sq. ft.
Heating surface, total	1544 sq. ft.
Tubes, no. and diar.	234—2 ins.
Tubes, length	11 ft. 5⅞ ins.
Firebox, length and width	96⅜ by 41⅞ ins.
Grate area	28 sq. ft.
Staying	Radial and cross
Tender capacity, water	3,500 imp. gals.
Tender capacity, coal	4 tons

Following are chief details of the 30 Pacific type locomotives, class G2, which the C.P.R. is having built by the Montreal Locomotive Works:—

Weight on drivers	142,000 lbs.
Weight of engine, total	220,000 lbs.
Weight of tender	139,000 lbs.
Heating surface, firebox	183 sq. ft.
Heating surface, flues	2777 sq. ft.
Heating surface, total	2960 sq. ft.
Heating surface, superheater	539 sq. ft.
Grate area	45.6 sq. ft.
Tubes, no. and diar.	175—2¼ ins. and 18—2 ins.
Flues, no. and diar.	22—5¼ ins.
Driving wheel base	13 ft.
Wheel base of engine, total	33 ft. 7 ins.
Wheel base of engine and tender	59 ft. 6¾ ins.
Boiler, type	Extended wagon top
Boiler, pressure	200 lbs.
Cylinders, diar. and stroke	22½ by 28 ins.
Driving wheels, diar. outside	70 ins.
Valve gear	Walschaert
Superheater	Vaughan and Horsey
Capacity of tender, water	5,000 imp. gals.
Capacity of tender, coal	10 tons

Following are chief details of the 75 Mikado freight locomotives, class P1, which the C.P.R. is having built by the Montreal Locomotive Works:—

Weight on drivers	198,000 lbs.
Weight of engine, total	258,000 lbs.
Weight of tender	170,000 lbs.
Heating surface, firebox	191 sq. ft.
Heating surface, tubes	3788 sq.ft.
Heating surface, total	3979 sq. ft.
Heating surface, superheater	612 sq. ft.
Grate area	49 sq. ft.
Tubes, no. and diar.	210—2¼ ins.
Flues, no. and diar.	30—5¼ ins.
Wheel base, driving	16 ft. 6 ins.
Wheel base, total engine	35 ft. 5 ins.
Wheel base, engine and tender	66 ft. 5 ins.
Boiler, type	Extended wagon type
Boiler pressnre	180 lbs.
Cylinders, diar. and stroke	23½ by 28 ins.
Driving wheels, outside diar.	63 ins.
Valve gear	Walschaert
Superhoater	Vaughan and Horsey
Tender capacity, water	7,000 imp. gals.
Tender capacity, coal	16 tons

The Quebec Central Ry. has ordered four 10 wheel locomotives from the Canadian Locomotive Co. Following are the chief details:—

Weight on drivers	127,500 lbs.
Weight, total	158,500 lbs.
Wheel base, rigid	14 ft. 1 in.
Wheel base, engine, total,	24 ft. 4 ins.
Wheel base, engine and tender	52 ft. 1 in.
Heating surface, firebox	165 sq. ft.
Driving wheels, diar.	63 ins.
Driving wheel centres	Cast steel
Driving journals, diar. and length	9 by 12 ins.
Cylinders, diar. and stroke	21 by 26 ins.
Boiler, type	Extended wagon top, radial stay
Boiler pressure	190 lbs.
Tubes, diar.	2 and 5⅜ ins.
Tubes, length	13 ft.
Brakes	Westinghouse E.T. 6
Weight of tender, loaded	124,000 lbs.
Tank capacity, water	5,000 imp. gals.
Tank capacity, coal	10 tons
Tank, type	V shape
Truck, type	Four wheel
Wheels, diar.	36 ins.
Wheels, type	Solid steel
Journals, diar. and length	5½ by 10 ins.
Brake beam	Simplex

Following are chief details of the class D4g locomotives, which are being built at the C.P.R. Angus shops, as mentioned in our last issue:—

Weight on drivers	114,000 lbs.
Weight, total	138,700 lbs.
Driving wheels, diar.	62 ins.
Wheel base, rigid	11 ft. 10 ins.
Wheel base, engine, total	22 ft. 1 in.
Wheel base, engine and tender	50 ft. 2 ins.
Cylinders, diar. and stroke	19 by 24 ins.
Valve, type and gear	Piston, 11 ins.
Valve gear	Walschaert
Axles, driving, main	8½ by 8½ ins.
Axles, leading and trailing	8 by 8½ ins.
Axles, engine truck	5 by 8 ins.
Axles, tender	5 by 9 ins.
Boiler, type	Wagon top
Boiler pressure	180 lbs.
Heating surface, firebox	152 sq. ft.
Heating surface, tubes	911 sq. ft.
Heating surface, total	1062 sq. ft.
Heating surface, superheater	235 sq. ft.
Tubes, no. and diar.	117—2 ins.; 18—5 ins.
Tubes, length	10 ft. 11 1-16 ins.
Firebox, length and width	96¾ by 41¾ ins.
Grate area	28 sq. ft.
Superheater	Vaughan and Horsey
Staying	Radial and cross
Tender capacity, water	4,000 imn. gals.
Tender capacity, coal	10 tons

Following are chief dimensions of the class E3 locomotives, which the C.P.R. is building at its Angus shops, as mentioned i our last issue:—

Weight on drivers	107.324 lbs.
Weight, total	145,757 lbs.
Driving wheels, diar.	70 ins.
Wheel base, rigid	13 ft. 3 ins.
Wheel base, total engine	23 ft. 11 ins.
Wheel base, engine and tender	51 ft. 1¾ ins.
Cylinders, diar. and stroke	19 by 24 ins.
Valve, type and diar.	Piston, 11 ins.
Valve gear	Walschaert
Axles, driving, main	8½ by 8½ ins.
Axles, leading and trailing	8 by 8½ ins.
Axles, engine truck	5 by 9 ins.
Axles, tender	5 by 8 ins.
Boiler, type	Wagon top
Boiler pressure	180 lbs.
Heating surface, firebox	152 sq. ft.
Heating surface, tubes	1045 sq. ft.
Heating surface, total	1197 sq. ft.
Heating surface, superheater	265 sq. ft.
Tubes, no. and diar.	117—2 ins.; 18—5 ins.
Tubes, length	12 ft. 5 1-16 ins.
Firebox, length and width	96⅜ by 41¾ ins.
Grate area	28 sq. ft.
Superheater	Vaughan and Horsey
Staying	Radial and cross
Tender capacity, water	4,000 imp. gals.
Tender capacity, coal	10 tons

The 10 ten wheel locomotives which the C.P.R. is having built by the Canada Foundry Co., Toronto, will have the cabs fitted with side doors, and the front tank arranged to come up to the back of the cab, and make a covered gangway for the fireman. The tank will be fitted with a coal pusher on top of tank body, to be operated by two air cylinders, which, when lifted, will feed coal to front of tank. The cab will be equipped with electric light. Following are chief dimensions, etc.:—

Weight on drivers	198,000 lbs.
Weight on leading truck	25,000 lbs.
Total weight	223,000 lbs.
Weight of tender, loaded	134,000 lbs.
Wheel base, driving	16 ft. 6 ins.
Wheel base, total engine	25 ft. 5 ins.
Wheel base, engine and tender	55 ft. 11⅛ ins.
Cylinders, diar. and stroke	23½ by 32 ins.
Valves, type and diar.	Piston, 12 ins.
Driving wheels, diar.	63 ins.
Truck wheels, engine, diar.	31 ins.
Truck wheels, tender, diar.	36¼ ins.
Journals	
Main, 10 by 14 ins.; others,	9½ by 14 ins.
Journals, engine truck	6 by 11 ins.
Journals, tender truck	5½ by 10 ins.
Boiler, type	Extended wagon top
Boiler, pressure	180 lbs.
Boiler, outside diar., front end	6 ft.
Firebox length and width	104⅝ by 70½ ins.
Tubes, no. and diar.	210—2¼ ins.; 30—5¼ ins.
Tubes, length	15 ft. 2¾ ins.
Heating surface, tubes	2616 sq. ft.
Heating surface, firebox	165 sq. ft.
Heating surface, total	2781 sq. ft.
Heating surface, superheater	437 sq. ft.
Grate area	49 sq. ft.
Capacity, water	5,000 imp. gals.
Capacity, coal	12 tons
Stack height above rail	15 ft. 3 9-16 ins.
Width outside overall	10 ft. 6 ins.
Superheater	Vaughan and Horsey
Valve motion	Walschaert
Headlights	Electric
Steam heating	Canadian Gold system
Air brakes	Westinghouse, 11 ins. pump
Wheels	Steel tired with retaining rings

Telephone Train Dispatching on the Grand Trunk Railway.

The G.T.R. has had such success with the two telephoning dispatching circuits installed on its Northern division that it has decided to equip the whole line between Montreal and Chicago, which will be divided into five circuits as follows:—

1. Montreal to Brockville, Ont., 125 miles and 26 way stations. Dispatcher located at Montreal.

2. Brockville to Toronto, 210 miles, 30 way stations. Dispatcher located at Belleville, Ont.

3. Toronto to Sarnia, Ont., 169 miles, 30 way stations. Dispatcher located at Stratford, Ont.

4. Extends Port Huron to Battle Creek, Mich., 160 miles, 30 way stations. Dispatcher located at Battle Creek.

5. Battle Creek, Mich., to Chicago, Ill., 172 miles, 39 way stations. Dispatcher located at Battle Creek.

There will be approximately 155 way stations equipped in all, and it has been decided to use the standard 102C plector sets and the swinging type telephone transmitter arm, an order for the whole apparatus having been given the Northern Electric & Manufacturing Co., Montreal.

The Pere Marquette Rd. summer hotel, The Bungalow, at Erieau, Ont., was destroyed by fire, Oct. 12.

The Grand Trunk Pacific Ry. has, according to a Winnipeg press dispatch, decided to install telephone train dispatching over all its lines. The section between Fort William and Superior jct., Ont., will be equipped first.

... certain lines in Alberta.

SEALED TENDERS addressed to the Postmaster General, will be received at Ottawa until Noon, on

Friday, the 6th December, 1912,

for the conveyance of His Majesty's Mails on a proposed Contract for four years, six times per week, over Rural Mail Ronte from KING, ONTARIO, to commence at the pleasure of the Postmaster General.

Printed notices, containing fnrther information as to conditions of proposed Contract, may be seen and blank forms of Tender may be obtained at the Post Office of King and at the office of the Post Office Inspector at Toronto.

G. C. ANDERSON,
Superintendent.

Post Office Department,
Mail Service Branch,
Ottawa, 21st October, 1912.

Railway Development.

Projected Lines, Surveys, Construction, Betterments, Etc.

Alberta Interurban Ry.—The Board of Railway Commissioners has approved of location plans for the company's line near Calgary, Alta., from mileage 2.28 to 9.93, and of another line from mileage 0 to 5.49. (Oct., pg. 501.)

Alberta, Peace River and Eastern Ry.—Application was made recently to the Minister of Railways for approval of the route map of a line from the International boundary to Calgary, thence to Edmonton and on to the Peace river and Fort Churchill, on Hudson bay, a total distance of 1,535 miles. The Minister refused sanction, and stated that approval would only be given for such portion of the line as could be built in two years, and further applications would have to be made for the approval of route maps for additional mileage. Further consideration was postponed, and the Minister directed that the company and the Western Dominion Ry. should get together and come to an understanding as to their separate interests. See Western Dominion Ry. (Aug., pg. 411.)

Algoma Central and Hudson Bay Ry.—The annual report of the Lake Superior Corporation, owning the A.C. and H.B. Ry., stated that the railway had been completed to the C.P.R., and would shortly be open for traffic. The extension to the Canadian Northern Ry. is expected to be completed within a few months, and the further extension to the G.T. Pacific Ry. is expected to be completed by the time of holding the next annual meeting. The building of the new terminal station at Sault Ste. Marie and the improvement of the terminal facilities there and at the port of Michipicoten are progressing satisfactorily. (Oct., pg. 501.)

Algoma Eastern Ry.—Press reports state that the line will be completed through to Little Current, Manitoulin Island, Ont., this year, except for the swing bridge over the channel at Little Current. (Aug., pg. 411.)

The British Pacific Coal Co. has been carrying out an extensive development programme on Graham island, the chief island of the Queen Charlotte group off the coast of British Columbia, in the vicinity of Prince Rupert. The company has built a line of 1.25 miles from the pit mouth to a 600 ft. shipping wharf at Queen Charlotte city. An adjoining property is being developed by the Standard Coal Mining Co., which proposes to build a line from its mines to the same wharf. T. R. Morrow, Vancouver, B.C., is president of the B.P.C. Co.

Burrard Inlet Tunnel and Bridge Co.—The Board of Railway Commissioners has approved of revised location plan for the line in the vicinity of the second narrows of Burrard Inlet, near Vancouver, B.C., station O L 174 and 88.7.

There is considerable local opposition to the 200 ft. central swing span in the proposed bridge, and the Department of Public Works is being appealed to for the purpose of having further consideration given to the plans. (Oct., pg. 501.)

Canadian Car and Foundry Co.—Application is being made to the Dominion Parliament for an act confirming the company's letters patent and authorizing it to build a line connecting its Dominion plant in St. Pierre, Que., with its Turcot plant in Montreal, and also with other plants as may from time to time be found convenient; and also to confirm agreements made between the company and the Government and the G.T.R.

Calumet and Northern Ry.—Application is being made to the Quebec Legislature to incorporate a company with this title to build a railway from Calumet to St. Jovite. The provisional directors named are:—J. R. Colby, Montreal West; E. W. Whiting, A. T. Stewart, A. Cushing, T. M. Papineau, Montreal.

Canada and Gulf Terminal Ry.—At the annual meeting in Montreal, Oct. 4, it was decided to leave the question of the extension of the line in abeyance until it has been definitely decided which form the aid to be granted by the province will take. In the meantime the final surveys for the location of the line through the centre of the Gaspe peninsula are being made. (Sept., pg. 450.)

Central Ry. of Canada.—A resolution was passed at a public meeting in Midland, Ont., Oct. 10, endorsing the company's project to build a direct line from Montreal via Ottawa to Midland. C. N. Armstrong, Vice President, said the distance between the two points is 335 miles, and the contract calls for the building of a line with a 0.4 gradient. The company has offered to grant the Dominion Government running powers over the line on an equitable basis. He also said that it is expected to start work upon the western half of the line in the spring. (Oct., pg. 501.)

Dominion Atlantic Ry.—We are officially advised that a contract has been let to Kirk and Cooke, North Sydney, N.S., for building a line from Centreville, on the Cornwallis branch, to Weston, N.S., 15 miles. A start was made with construction early in October.

We are further officially advised that the trestle bridge at Smiths Cove, N.S., which is 375 ft long, about 50 ft. deep, with 15 ft. openings, is to be replaced by a 10 ft. C.P.R. standard concrete arch and filled. There will we about 40,000 cubic yards of filling, with an arch 155 ft. long. (Oct., pg. 501.)

Active construction on the line has been started by the contractors. The line is 15 miles long, with about two miles of sidings. There will be five stations, Lakeville, Belltown, Grafton, Somerset and Weston. The contract calls for the completion of the line by Aug., 1913, and it is expected to have track laid to Lakeville by the end of the year.

Edmonton, Dunvegan and British Columbia Ry.—The Board of Railway Commissioners has authorized the company to connect its line with the G.T. Pacific in sec. 24, tp. 53, range 25 west 5th meridian, near Edmonton, Alta.

Tracklaying is reported to have been started near Edmonton, and it is expected to have about 120 miles laid this season. The grading is reported completed to Athabasca Landing.

The company will use the union station to be erected by the G.T. Pacific Ry. for passenger traffic in Edmonton, but is laying out its own freight terminals on a site of 142 acres adjoining those of the G.T. Pacific Ry. (Oct., pg. 501.)

Erie, London and Tillsonburg Ry.—We are officially advised that the route map for this line has been approved for the section from Port Burwell to Aylmer, Ont., and that the route map for the balance of the line from Aylmer to London, is before the Minister of Railways for approval. Nothing further has been definitely settled. Only sufficient work is being done in the vicinity of Port Burwell, at present, to retain the charter rights which have been secured by the G. T. R. (Oct., pg. 501.)

Esquimalt and Nanaimo Ry.—The extension from McBride Jct. to Courtenay, in the Comox Valley, Vancouver Island, B.C., will be about 45 miles long. About 15 miles is reported graded from McBride Jct., and about 10 miles of grading from Courtenay southerly. Tenders are under consideration for the supply of 50,000 ties for the section of the line from McBride Jct. to Big Qualicum river; and for the grading and bridging from Big Qualicum river to Union bay, 19.29 miles. There will be seven steel bridges from 60 to 80 ft. long, and 10 large trestles on the entire extension. The trestles will subsequently be filled. (Oct., pg. 501.)

Fort George to Barkerville, B.C.—Application is being made to the British Columbia Legislature to incorporate a company to build a railway to be operated by steam, electricity or other power from Fort George southeasterly to the Fraser river, at Six Mile creek, and on to the Willow river, thence northeasterly to the Bear river, and thence southeasterly to Barkerville, or between the same points by any other feasible route. Burns and Walkem, Vancouver, B.C., are solicitors for applicants.

Grand Lake and Bell River Ry.—We are officially advised that the charter for the building of this railway was granted to owners of timber limits in the Grand lake district of Quebec. Since the charter was obtained, and subsidies voted by the Dominion Parliament and the Quebec Legislature, the North Ry. has been organized to build a line from Montreal to connect with the National Transcontinental Ry. at Bell river crossing. As this line is likely to pass through the district which the G.L. and B.R. Ry. was projected to serve, it is quite probable that the latter company will not proceed to organization. (July, pg. 339. See North Ry.)

Fredericton and Grand Lake Coal and Ry. Co.—We are officially advised that construction on this railway has been much impeded by the general bad weather, but, nevertheless, a good portion of the grading has been completed. The work on the bridge foundations, particularly, has been retarded by the frequent recurrence of high water, but at Little river and at the Nashwaak river a considerable portion of the concrete for the abutments and piers has been placed. Track has been laid for nine miles eastward from Gibson, and for six miles westward from the end of the New Brunswick Ry. and Coal Co.'s line near Minto. There are three steam shovels and the necessary train service employed, one of the shovels being devoted to ballasting, which has been completed for about seven miles. It is expected to have steel laid through, and most of the work completed by the end of the year. The branch line from Gibson to Marysville, about three miles, was put under construction at the beginning of October. H. W. D. Armstrong, Fredericton, N.B., is Chief Engineer. (Sept., pg. 450.)

Halifax and South Western Ry.—In a recent interview, the Deputy Commissioner of Mines for Nova Scotia is reported as saying, after having made an inspection of the line, that there was no dangerous condition of the roadbed as had been alleged. There were a considerable number of worn-out ties on the first two sections, but these were being replaced. There were also places on the line where more ballast would improve the appearance, and perhaps the smoothness of running. "It is not clear to me," he added, "that there have been casualties exceeding those on any other road for the same train mileage." (May, 1911, pg. 409.)

Huntingdon and Hemmingford Ry. Co.—Application is being made to the Quebec Legislature to incorporate a company with this title to build a railway from Huntingdon to Hemmingford, Que. The provisional directors named are:—H. Timmis, R. H. McMaster, R. H. Barron, Montreal; C. W. Taylor, A. R. McMaster, K.C., Westmount, Que.

Interprovincial and James Bay Ry.—We have been officially advised that this railway company is a subsidiary of the C.P.R.

The Board of Railway Commissioners has approved location through the parishes of Gendreau and Mercier, Que., mileage 0 to 10.11. The line is planned to start from the C.P.R. Kipawa branch, near Kipawa, and the route has been approved by the Minister of Railways as far as Ville Marie, 54 miles.

Kettle Valley Lines.—Steel is reported to have been laid to Carmi, B.C., and grading from that point to the Hope summit is progressing favorably. The work in the vicinity of Penticton is also reported to be progressing at a satisfactory rate. It is expected that the line will be completed through to the Fraser river by Feb., 1914. The line will include the Hope mountain section, which is being built as a joint section under an agreement by the Vancouver, Victoria and Eastern Ry. As will be seen by reference to the C.P.R. Co.'s annual report on another page of this issue the K.V.L. is to be leased to that company on completion. (Oct., pg. 501.)

C. J. Seymour, engineer on construction, is quoted as having stated in Vancouver, Oct. 11, that it was expected to let the last of the contracts shortly. A location party was engaged in the work between Coquihalla summit and Hope, on the Fraser river, the distance down the valley of the Coquihalla river being nearly 40 miles. As now laid out it will entail the construction of 17 tunnels of different lengths, and the grade up this valley will be 2.2%, compensated on curves. At Hope the Fraser river will be bridged to connect with the C.P.R. tracks, the structure at present contemplated being estimated to cost $750,000. The average cost of construction up the Coquihalla valley is estimated at something over $100,000 a mile, and under the arrangements arrived at through the Board of Railway Commissioners some time ago, it will be used jointly by the K.V. Ry. and the Vancouver, Victoria and Eastern Ry., the lines connecting at Coldwater on the summit. The V.V. & E. has already let a contract for construction from Coalmont to Coldwater, 46 miles, and Twohy Brothers are building 13 miles from the Kettle valley loop.

Mexican Gulf and Manitoba Ry.—Press reports state that surveys have been completed by J. M. Wiley, Chief Engineer of a railway with this title, for the building of a line from Baton Rouge, on the Mississippi river, Louisiana, U.S., through Leroy, Minneapolis, Princeton, Brainerd, Park Rapids, Mallard, Abda, Bagley and Chourbrook, to the International boundary, and thence to Winnipeg, Man.

A Minneapolis, Minn., despatch, Oct. 7, says J. M. Wiley, F. Beckley and A. J. Beall were arrested and arraigned before the grand jury there on a charge of using the U.S. mails to defraud in connection with the promotion of a company to build a railway from Winnipeg to the Gulf of Mexico. The accused entered pleas of not guilty, and the case was set down for hearing at the U.S. District Court in April, 1913. Beckley and Beall submitted that they were only employes of Wiley, but the U.S. counsel argued that they were represented as officers of the company. Pending the provision of bail the accused men were taken to jail.

Minneapolis, St. Paul and Sault Ste. Marie Ry.—Press reports state that an extensive property has been acquired in Milwaukee, Wis., for a terminal site for a branch line of the M., St.P. and S.S.M. Ry., or its leased line, the Wisconsin Central Ry.

Another report states that the financial end of the project for the laying out of a large union freight yards terminals and freight and passenger stations, has been arranged, and that the M., St.P. and S.S.M. Ry. is one of the companies guaranteeing the bond issue.

A third report states that a project is under consideration for the extension of one of the company's lines to Great Falls, Mont., and connecting up at Coutts, Alta., with the Alberta Ry. and Irrigation Co.'s line. (Oct., pg. 502.)

North Ry.—F. H. Clergue is reported as stating that surveys would be sufficiently advanced by the beginning of 1913 to give out at least part of the contracts. Construction can be carried on north and south from the National Transcontinental Ry. at the crossing of the Bell river; from Montreal, and from the shore of Nottawa bay. (Sept., pg. 491.)

Ontario-Michigan Ry.—Application is being made to the Dominion parliament to extend the time for the construction of the lines authorized to be built by chap. 122 of the statutes of 1910-11. (July, 1911, pg. 647.)

Pacific Great Eastern Ry.—A contract for the building of this line from Vancouver to Fort George, B.C., has been let to P. Welch, who has resigned his position as Vice President to accept it. Construction headquarters are being established at Lillooet, and work will be pushed forward in the direction of Fort George. The location surveys for this section of the line are completed.

After considerable negotiations the company has acquired the railway and all other property of the Howe Sound and Northern Ry. for $1,000,000, payable in cash in three annual instalments. The agreement of sale, it is said, was signed in Victoria, Oct. 10. The H.S. and N. Ry. has about 10 miles of line in operation running from Newport at the head of Howe sound inward, with power to build into Vancouver on the one side, and via Lillooet to Fort George on the other. It has valuable water frontage rights on Howe sound and a considerable land property in Newport. J. C. Keith, A. McEvoy, formerly of Toronto, and J. C. Gill, Vancouver, were the principal owners of stock in the company. The purchase of this property settles the difficulties of the route as between Vancouver and Lillooet, and will enable construction to be proceeded with more speedily. (Oct., pg. 502.)

Quebec and Saguenay Ry.—We are advised that construction work on this line was closed down at the end of Aug., by the subcontractors, on instructions received from O'Brien and Doheny, the general contractors. The cause assigned is that the cost of construction was far exceeding the original estimate, and the capital raised was not much in excess of these estimates. The estimates of quantities and of cost were made by the engineers in charge, before the appointment of A. H. U. Bruce, the present Chief Engineer. The directors hope to be in a position to reopen the work at an early date and to complete the line. The section under construction extends from near St. Joachim to Murray Bay, Que., 56 miles. The work to Subgaach is about 95% completed, and most of the concrete work of the piers and abutments of the bridges has been completed. Ten miles of rails are on the ground, and the ties and all other track material for the 56 miles has been delivered. The main work still to be done to complete the contract is a small amount of grading, the tracklaying, ballasting, and the putting in place of the steel bridges. It is not intended to erect any station buildings, tanks, etc., until the steel is laid. The company has completed a line from Murray Bay to the pulp works near Nairns Falls.

A Quebec press despatch, Oct. 9, states that the general contractors, O'Brien and Doheny, are petitioning for the liquidation of the company in order to secure the payment of $850,000 stated to be due on construction account. The petition will be considered by the Exchequer Court at an early date.

Quebec and North Eastern Ry.—The Quebec Legislature is being asked to incorporate a company with this title to build a railway from the western boundary of the province near Oposatica lake, Pontiac county, northeasterly through the clay belt to the National Transcontinental Ry., near Lake Kapitachuan, about 160 miles, with branch lines, one from the crossing of the Belle river by the N.T. Ry., southeasterly to Mount Laurier, and on to Three Rivers, on to Grand Piles and on to Quebec; and a second from Lake Timiskaming southerly via Ville Marie, thence northeasterly to Lac des Quinze or Lake Expanse. G. Parent, Quebec, is solicitor for applicants.

Reid Newfoundland Co.—Grading is reported to be completed on 80 miles of the branch from near St. Johns to Trepassey Bay, Nfld., and track laid on 70 miles. On the 35 mile branch from Broad Cove to Hearts Content, 12 miles of grading is reported completed and 10 miles of track laid. (Aug., pg. 412.)

St. John and Quebec Ry.—The New Brunswick Government has authorized the issue of $160,000 of the guaranteed bonds of the St. J. and Q. Ry. Co. on account of the building of the line along the St. John River valley between St. John and Grand Falls. The guaranteed bonds are issued from time to time as required on the progress estimates approved by the Provincial Engineer. (Oct., pg. 502.)

Saskatoon Transfer Ry.—Tenders are reported to be under consideration for the building of a transfer railway through the industrial section of Saskatoon, Sask. The railway is to be built by the Saskatoon Industrial Development and Power Co. It is hoped to have the grading completed this year and to lay the steel next spring.

We are officially advised that the following are the present directors and officers:—Vice President, J. W. White; Treasurer, C. I. Alexander; Chief Engineer, T. W. Brown; directors, A. Flether, A. Dick, —. Anthes. The President had not been elected.

The Sydney and Louisburg Ry. proposes to build a new bridge in Dominion, N.S., in place of the one known as the Red bridge, and to reduce the height over the rails to not less than 15½ ft. (June, pg. 302.)

Timiskaming and Northern Ontario Ry.—In connection with the proposal to electrify one track of the double track between North Cobalt and Cobalt see item Nipissing Central Ry., under Electric Railway Projects, Etc. (Oct., pg. 502.)

The bridge on the Charlton to Elk Lake branch, across Jean Baptiste creek, was reported to have been completed Oct. 12. Track laying is being delayed on account of the scarcity of steel, but the Chairman of the Commission is reported to have stated that he expected steel will be laid into Elk Lake early in December.

Surveys are reported to have been started for a spur line from Iroquois Falls Jct. to the river, where a large pulp mill is being built.

Toronto, Hamilton and Buffalo Ry.—At a conference with the Hamilton board of control, Oct. 2, the General Superintendent stated that the company preferred to raise rather than depress its tracks. The company's engineers are working on plans with that object in view, and will submit them at an early date. (Oct., pg. 502.)

Western Dominion Ry.—A general meeting of shareholders has been called to be held at Carleton Chambers, Ottawa, Nov. 7, to consider an agreement for the purchase by the W.D. Ry. of the Alberta Pacific Ry.'s rights and property. O. E. Culbert is Secretary.

A route map of a section of this projected railway, which has been filed with the city clerk of Calgary, Alta., shows the line running from tp. 22, range 3, west of 5th meridian, and to the south of the Sarcee Indian reservation. From this point it runs into Calgary, and following a course a considerable distance west of, but parallel to the C.P.R. Calgary-Edmonton line, turns into Edmonton. The city council has declined to express any approval of the route until a map is submitted showing in detail the proposed route within the city boundary.

Application will be made to the Board of Railway Commissioners, Nov. 16, for a recommendation to the Governor-in-Council for the sanction of an agreement for the purchasing by the W.D. Ry. Co. of all the charter rights, etc., of the Alberta Pacific Ry. Co., and for the amalgamation of the two companies.

In the course of an application of the Atlantic, Peace River and Eastern Ry. to the Minister of Railways for approval of a route map, representatives of the W.D. Ry. entered opposition on the ground that the route granted to them under a provincial charter would be interfered with. The Minister intimated that before the matter came before him again the two companies should reach an agreement as to the location of their respective lines.

White Pass and Yukon Route.—We are officially advised that the directors are not yet in a position to say definitely whether or not the line will be extended as reported. The matter has been under consideration for some time. (Sept., pg. 451.)

Grand Trunk Railway, Betterments, Construction, Etc.

Portland, Me.—As the result of a recent inspection by Montreal officials, press reports state, it has been decided to demolish the present wharf and immigration buildings at Portland next year, and to replace them by larger structures.

Central Vermont Ry. Improvements.—The Board of Railway Commissioners has granted an extension of time within which the company shall ballast its line between St. Lambert and Waterloo; Marneville and St. Cesaire; Farnham and Freligsburg; Iberville and Farnham, Que.

Quebec Freight Sheds.—A conference has been held between representatives of the Quebec harbor and Vice President Kelley, G.T.R., with a view to the demolishing of the present freight sheds at Point Levis, and the building of a structure there sufficiently large to accommodate the traffic of the G.T.R., the Intercolonial Ry. and the Quebec Central Ry.

Montreal.—An arrangement has been completed between the company and the Montreal city council to divert the line of St. Etienne street so as to improve the approaches to the Victoria Jubilee bridge, and to extend the freight yard there.

The council has granted a permit for the erection of a six-story solid brick building for freight offices, on the corner of Wellington and St. Etienne streets, at an estimated cost of $90,000. As announced in our last issue the contract for the building has been let to the John S. Metcalf Co., Montreal.

Prescott, Ont.—R. S. Logan, Vice President, informed the Prescott, Ont., town council at a recent meeting, that owing to the lateness of the season it would not be possible to do very much with the laying out of the proposed terminals there this year, but that a start would be made early next spring.

Orillia to Midland, Ont.—The track between Orillia and Midland, Ont., 33½ miles, is being relaid with 90 lbs. steel, replacing the old 60 lbs.

Canada Atlantic Ry.—Superintendent Coleman is quoted as stating, Oct. 14, that the company had under consideration plans for the extension of its harbor facilities at Depot Harbor, Ont. The grain carrying trade at the port has doubled during the year.

Ottawa Terminals Ry.—Application is being made to the Dominion Parliament to authorize the company to increase its bond issue from $3,000,000 to $6,000,000.

Hamilton Freight Yards.—The Board of Railway Commissioners has authorized the company to lay six tracks across Robert street to connect with its new freight yard at the corner of Elgin and Barton streets, Hamilton, Ont.

Grand River Bridge, Brantford.—The Board of Railway Commissioners has authorized the rebuilding of bridge 75, mileage 8.21, over the Grand river at Brantford, Ont. Work was reported to have been started Oct. 14, and it is expected that the bridge will be completed by the spring. The plans provide for erection of an additional span of 76½ ft. at the western end, and the lengthening of the eastern span by 15 ft. The new piers and abutments will be of concrete. The cost is estimated at $40,000.

Electrification of Branch Lines.—A petition asking for the electrification of the Galt and Elmira branch lines was presented to U. E. Gillen, Superintendent Middle division, at Waterloo, Ont., Sept. 25. He is reported to have expressed his general approval of the project, and to have stated that it would be given every consideration by the management at an early date. (Oct., pg. 503.)

Great Northern Railway Lines in Canada

Vancouver, Victoria and Eastern Ry. and Navigation Co.—A. H. Hogeland, Chief Engineer, G.N. Ry., returned to Vancouver, B.C., Oct. 10, after an inspection of construction work on the line. He is reported as stating in an interview that the quantity of work done since his last visit had exceeded his expectations. There was considerable scarcity of labor, and the work was consequently held back. The line is now completed between Penticton and Coalmount in the Coquihalla valley. A contract has been let to Guthrie, McDougal and Co. for the grading of 42 miles from Coalmount to Coquihalla summit. This firm has sublet 26 miles of the contract, and has a large gang at work on the other 16 miles. The only section of the line not under construction is the 38 mile stretch between Coquihalla and Hope, which is the roughest portion on the whole line. It is to be built for joint operation by the V. V. and E. Ry. and the Kettle Valley Lines. It is expected to have the line from the present terminus at Abbotsford in operation to Hope by the end of the year. This mileage includes a section of the Canadian Northern Pacific Ry., for the use of which an agreement has been approved. The western section of the line comprises the old New Westminster Southern Ry., the constructed section of the Vancouver, Westminster and Yukon Ry., and some other pieces of line, which connect up with New Westminster, Vancouver, and the ferries plying from Port Guichon to connect with the Victoria and Sidney Ry. on Vancouver Island.

Vancouver Terminals.—A. H. Hogeland, Chief Engineer, G.N.R., is reported as having stated in Vancouver, Oct. 10, that he expected the company would start active work on the construction of the new station within the next six months, and that it would be completed about the same time as the grading and filling work now under way on False creek. (Oct., pg. 507.)

Maintenance of Way by Contract.

In reference to the article on this subject which appeared in Canadian Railway and Marine World for October, one of the most prominent and practical railway officials in the Dominion has written us as follows:—

"I favor doing all work possible by contract, but I do not think it would ever be advisable to let the maintenance of way and bridges by contract, for the reason that it would be difficult to supervise contractors, and I do not see how they could perform this work at any less cost than a railway company, and in my opinion they certainly would not do it as well.

"Of course, grading, track laying and ballasting on new lines are let by contract, and we also contract for crushed rock, etc., but I would never favor letting ordinary maintenance by contract. The experience of railways which let repairs to their freight cars and locomotives by contract does not appear to have been very saisfactory."

Canadian Northern Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those for 1911-12, from July 1, 1912:—

	Gross Earnings	Expenses	Net Earnings	Increase
July	$1,829,700	$1,335,100	$494,600	$133,000
Aug.	1,745,800	1,375,000	370 800	56,100
	$3,575,500	$2,710,100	$865,400	$189,100
Incr.	$ 679,000	$ 489,900	$189,100	.....

Approximate earnings for Sept., $1,671,500, against $1,576,400 for Sept., 1911.

The mileage in operation during Aug. was 4,297, against 3,711 in Aug., 1911.

Canadian Pacific Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases or decreases, compared with those for 1911-12, from July 1, 1912:—

	Gross Earnings	Expenses	Net Earnings	Increase
July	$12,052,398.58	$7,604,221.68	$4,448,176.90	$745,148.57
Aug.	12,251,715.87	7,533,790.21	4,717,925.66	642,354.65
	$24,304,114.45	15,138,011.89	$9,166,102.56	$1,387,503.22
Inc.	4,220,391.89	2,832,888.67	1,387,503.22	.....

Approximate earnings for Sept., $11,322,000, against $9,834,000 for Sept., 1911.

Grand Trunk Railway Earnings, Etc.

Aggregate from July 1 to Sept. 30:—

	1912.	1911.	Increase.
G.T.R.	$11,359.577	$10,351.000	$1,008.577
C.A.R.	620,311	551,464	68.847
G.T.W.R. ..	1,681.962	1,685.190	96.772
D.G.H.&M.R.	615.359	570.764	44.595
Totals ..	$14,277,209	$13,158,618	$1,218,791

W. HARTY, Kingston, Ont., formerly President, Canadian Locomotive Co., has given $1,000 to the Kingston general hospital.

Mainly About Transportation People.

W. H. ARDLEY, General Auditor, G.T.R., Montreal, has been appointed a justice of the peace.

WALTER LINDLEY, at one time Secretary, Grand Trunk Ry. Co., died suddenly in England, Oct. 22, aged 80.

SIR WM. MACKENZIE, President, Canadian Northern Ry., has subscribed $2,000 to the Vancouver high school cadet fund.

G. L. BROWN, of the Pullman Co.'s staff, who died at St. Paul, Minn., Sept. 26, was well known in railway circles in Winnipeg.

S. S. FULLER, who died at Stratford, Ont., Oct. 1, was Vice President of the old Stratford and Port Dover Ry., now merged in the G.T.R.

W. SUTHERLAND TAYLOR, ex-Treasurer C.P.R., and Mrs. Taylor, who have been spending the summer in Great Britain, have returned to Montreal.

Mrs. G. M. Bosworth, wife of G. M. BOSWORTH, Vice President, C.P.R., was one of the recent arrivals in England, by the s.s. Empress of Britain.

S. R. NORCROSS, who died at Port Colborne, Ont., Oct. 1, was father of J. W. NORCROSS, Toronto, Manager Merchants' Montreal and Interlake Lines.

M. WHITTY, for many years G.T.R. roadmaster at Stratford, Ont., died at Mitchell, Ont., Oct. 9, aged 77. He had been living retired for some years.

J. G. SULLIVAN, Chief Engineer, Western Lines, C.P.R., Winnipeg, has been elected Honorary President of the Engineering Society of Regina, Sask.

BARLOW CUMBERLAND, ex-Vice President, Niagara Navigation Co., who has been living in Port Hope, Ont., for several years, has removed to Toronto for the winter.

HON. J. S. HENDRIE, M.P.P. for Hamilton, Ont., who has special charge of railway legislation, etc., in the Ontario Legislature, is visiting Scotland with his wife.

HON. F. COCHRANE, Minister of Railways and Canals, has sold his house in Toronto, which he occupied before becoming a member of the Dominion Cabinet.

A. TRITES, charge hand at the Intercolonial Ry. roundhouse, Moncton, N.B., fell into a firebox during the course of his work, Oct. 10, and had three of his ribs broken.

W. A. JEWETT, Nelson, B.C., has been appointed stipendiary magistrate for the territory west of the Rocky Mountains, with headquarters at Tete Jaune Cache, B.C.

REX CROASDELL, Publicity Agent, Canadian Northern Ry., who was operated on in Toronto, recently, for internal trouble, was reported, Oct. 24, to be progressing favorably.

JAS. NORTON was presented with a silver tea service by the staff of the Intercolonial Ry. general freight office, Moncton, N.B., on the occasion of his marriage recently.

R. W. BURNETT, General Master Car Builder, C.P.R., Montreal, has been elected a member of the M.C.B. special committees on car wheels and car trucks, for the 1913 convention.

E. J. CHAMBERLIN, President G.T.R. and G.T. Pacific Ry., has been elected President, G.T. Western Ry. and other G.T.R. subsidiary companies in Michigan, in succession to the late C. M. Hays.

R. CUMMINGS, for the past 14 years station agent at Truro, N.S., has retired after 41 years' service with the Intercolonial Ry. He and Mrs. Cummings left Truro, recently, for San Francisco, Cal.

S. McELMOYLE, Freight Claims Agent Canadian Northern Ry., Winnipeg, was presented with a cabinet of silverware by the staff of the General Freight Agent's office, Oct. 11, on the occasion of his marriage.

W. P. HINTON, General Passenger Agent, G.T. Pacific Ry., was the principal guest at a civic dinner at Watrous, Sask., Oct. 7, on the occasion of the opening of the sanatorium and summer hotel at Lake Manitou.

The Winnipeg Free Press of Oct. 5 recalls the fact that it was on that day in 1892 that D. B. HANNA removed from Portage la Prairie to Winnipeg to become Treasurer of the old Manitoba and Northwestern Ry.

WM. HARDER, who was one of the first C.P.R. officials who arrived in Winnipeg in Mar., 1881, as Traffic Manager of the western lines, paid a short visit to the city, Sept. 23, after an absence of nearly 30 years.

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W. H. Winterrowd,
Mechanical Engineer, C.P.R. Angus Shops, Montreal.

G. O. SOMERS, who resigned his position as General Freight Agent, Chicago Great Western Ry., a short time ago, has been appointed Manager of the Canada Bond Co., Ltd., which has been organized in Toronto.

A. E. KILLAM, Inspector of Bridges and Buildings, Intercolonial Ry., Moncton, N.B., has been elected President, American Railway Bridge and Building Association, for the current year. He was a Vice President during the year 1911-12.

A. B. CAREY, Resident Engineer, Vancouver Island Power Co., Victoria, B.C., was presented with a silver tea set, by the members of the staff engaged on the Jordan river power plant construction, on leaving the service, Sept. 23.

SCOTT GRIFFIN, European Manager, Canadian Northern Ry., and Canadian Northern Steamships, Ltd., and Mrs. Griffin, who is a daughter of Sir Wm. Mackenzie, will occupy the latter's house, 37 Curzon street, Mayfair, London, Eng., for the winter.

Miss D. A. Musgrove, only daughter of T. A. MUSGROVE, Repair Track Foreman, Canadian Northern Ry., Winnipeg, was married in Winnipeg, recently, to A. Tamm, of Davis and Tamm, civil and contracting engineers, Brownsville, Texas.

W. C. C. MEHAN, General Superintendent, and G. A. McNICHOLL, Superintendent G.T. Pacific Ry., Prince Rupert, B.C., were presented with gold pins, by the Governor General, recently, in connection with his trip over that part of the system.

A. LICHTENHEIN, of New Rochelle, N. Y., representative of the Galena-Signal Oil Co., who spends a considerable portion of his time in Montreal, was operated on, Oct. 14, for appendicitis. On Oct. 19 we were advised that he was recovering satisfactorily.

E. J. CHAMBERLIN, President, G.T.R. and G.T.P.R.; M. Donaldson, Vice President G.T. Pacific Ry., and G. E. Fauquier, railway contractor, Ottawa, were members of a shooting party which returned to Winnipeg, Oct. 12, over the G.T. Pacific Ry. from the Rocky Mountains.

M. J. POWER'S appointment as General Storekeeper, Canadian Pacific Ry., was correctly announced in Canadian Railway and Marine World for September, but in the October issue he was erroneously referred to as the General Purchasing Agent, which position is held by E. N. Bender.

J. W. LEONARD, Assistant to the Vice President, C.P.R., Montreal; M. N. Todd, President, Galt, Preston and Hespeler St. Ry., and J. Irving, General Sales Agent, Nova Scotia Steel and Coal Co., arrived in Quebec by the s.s. Empress of Britain, Oct. 11, after a two months' trip to Europe.

ARTHUR LE COUR, of Montreal, who was engaged as chief clerk on the G.T.R. grade separation work in the west end of Toronto, died suddenly, Oct. 19, from hemorrhage of the stomach, in Montreal, where he had gone to check all accounts between the city and the railway in connection with the work.

HON. M. E. BERNIER and JAMES MILLS, members of the Board of Railway Commissioners, will at the end of 1913 have served for 10 years, and it is reported that they will then be superannuated, and with that end in view the necessary legislation will be introduced at the Dominion parliament's ensuing session.

R. DOLLAR, principal owner and manager of the Dollar line of steamships, trading between San Francisco, Cal., and the Orient, but registered at Victoria, B.C., according to the London Times, is a native of Scotland, and started life as a shanty chore boy at $10 a month with the Edwards Lumber Co., Ottawa, when 13 years old.

J. T. McGRATH, who recently resigned as Superintendent of Rolling Stock, Chicago and Alton Rd., Bloomington, Ill., following the resignation of F. W. Morse as Vice President and General Manager, was, at one time, Master Mechanic, G.T.R., Battle Creek, Mich., which position he resigned on Mr. Morse entering the Chicago and Alton Rd.'s service.

J. E. WALSH, Manager of the Canadian Manufacturers Association traffic department, was reported recently to have been appointed as an additional traffic expert to the Board of Railway Commissioners. We have been officially advised that such an appointment has not been made, and Mr. Walsh has also made a statement to the same effect.

SIR WILLIAM WHYTE, of Winnipeg, who is a director of the C.P.R., must have been amused when he saw his portrait in Toronto Saturday Night recently and under it the caption, "Sir William Whyte, K.C.B., elected a director of the Grand

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TORONTO, CANADA, NOVEMBER, 1912.

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Trunk Pacific Ry. Co." The G.T.P.R. director is Sir Wm. Henry White, K.C.B., who lives in England.

W. A. GARRETT, recently chairman of the General Managers' Association of Chicago, has been elected Vice President in charge of operation of the Chicago Great Western Rd., at Chicago, Ill.

C. S. MELLEN, President of the New York, New Haven and Hartford Rd., has also been elected President of the New York, Ontario and Western Ry., succeeding T. P. Fowler, resigned.

R. J. LYDIATT, chief clerk to A. Price, General Superintendent, Alberta division, C.P.R., Calgary, has resigned, on his appointment as private secretary to the chairman of the governors of Calgary university. He was chief clerk to Mr. Price, during the period from 1899, when the latter was located at Toronto, Fort William, Winnipeg and later at Calgary.

J. McLELLAN, who died in Winnipeg, Oct. 8, was identified with the Manitoba Cartage Co. soon after he went to Winnipeg in 1878, and later on joined the C.P.R., with which company he remained until he retired from active service about 18 months ago. He served as roadmaster and trainmaster prior to becoming city freight agent, which position he vacated in 1905, subsequently being appointed Superintendent of Terminals at Winnipeg.

T. HICKEY, Roadmaster, Michigan Central Rd., St. Thomas, Ont., sustained a broken leg and some severe cuts, when his gasoline car jumped the rails near Muncie, Oct. 8. He was accompanied by W. O. Houston, Division Engineer, and Assistant Roadmaster Kinney, who both escaped with slight bruises. It was later discovered by the confession of a number of small boys, that the placing of a spike in a switch point was the cause of the accident.

R. A. BARRETT, who has been appointed Superintendent, Toronto, Hamilton and Buffalo Ry., Hamilton, Ont., commenced railway service as Yardmaster, Michigan Central Rd., at Montrose, Ont., and was subsequently Trainmaster, M.C.R. division east of St. Thomas, Ont., with headquarters at Niagara Falls, Ont., and in 1911 was appointed Trainmaster, T.H. & B. Ry., at Hamilton, Ont., which position he held to the date of his present appointment.

L. G. COLEMAN, who was recently appointed Superintendent, Ottawa division, G.T.R., Ottawa, was born in Macon, Ga., Dec. 7, 1877, and entered railway service, Oct 1, 1900, since when he has been, to May 1, 1902, engaged with the G.T.R., Delaware, Lackawanna and Western Rd., and with the Rogers Locomotive Works, returning to G.T.R. service, May 1, 1902, since when he has acted in the capacities of Trainmaster and Assistant Superintendent at Ottawa.

X. H. CORNELL, who has been appointed Superintendent of Transportation, Pere Marquette Rd., Detroit, Mich., was, at one time, Master of Transportation, G.T.R. Western division, Durand, Mich., resigning that position in 1909, on his appointment as Superintendent of Transportation, Chicago and Alton Rd., Chicago, Ill., when F. W. Morse, formerly Vice President and General Manager, G.T. Pacific Ry., was appointed Vice President and General Manager, Chicago and Alton Rd. His resignation from the C. & A. Rd. followed that of Mr. Morse.

ROBERT TOOMBS, Auditor, Minneapolis, St. Paul and Sault Ste. Marie Ry., Minneapolis, Minn., died suddenly in a street car there, Oct. 10. He had been troubled with heart disease for some time. He was born at Milwaukee, Wis., Apr. 19, 1859, and entered railway service in 1874. Before becoming connected with the M. St. P. & S.S.M.R. he was auditor of the Wisconsin Central Ry., now the Chicago division of the M. S. P. & S.S.M.R., and prior to that he was auditor of the Duluth, South Shore and Atlantic Ry., all of which are controlled by the C.P.R.

SIR DONALD MANN, who has been touring the Canadian Northern Ry. to the Pacific coast, returned to Toronto, Oct. 14. In connection with the recent report that his life had been attempted while in Vancouver, he stated that no such attempt had been made, but that an insane person, who had declared his intention of shooting him, Sir Thos. Shaughnessy and E. H. Harriman, had been taken care of by the police. The fact that Mr. Harriman has been dead for some time, is evidently a proof that the man is not in his right mind.

Biographical data respecting W. C. LANCASTER, Electrical and Mechanical Engineer, Montreal Tunnel and Terminal Construction, Mackenzie, Mann & Co., was published in Canadian Railway and Marine World for September, pg. 460, and his portrait should have been given on the same page, but by an unfortunate transposition it appeared in the Electric Railway Department on pg. 470, being designated as a portrait of F. D. Burpee, Superintendent and Purchasing Agent, Ottawa Electric Ry. Mr. Lancaster's portrait is therefore reprinted in this issue, with the correct designation.

A. J. IRONSIDES, whose appointment as District Master Mechanic, district 4, Saskatchewan division, C.P.R., Saskatoon, was announced in our last issue, was born at Orillia, Ont., in 1882, and entered C.P.R. service in 1901, since when he has been, to 1902, wiper at Windsor street roundhouse, Montreal; 1902, foreman, same place; 1902 to Aug., 1906, similar position at Brandon, Man.; Aug., 1906 to June, 1907, locomotive driver, same place; June to Dec., 1907, locomotive driver, Kenora, Ont.; Dec., 1907, to Apr., 1908, locomotive driver, Brandon, Man.; Apr., 1908, to Aug., 1912, locomotive driver, Sutherland, Sask.

H. E. WHITTENBERGER, who has been appointed Superintendent, Middle division, G.T.R., Toronto, and whose portrait appears in this issue, was born at Peru, Ind., Nov. 9, 1869, and entered transportation service in 1885, since when he has been, to Feb., 1897, in various positions, Wabash Rd.; Feb., 1897, to May, 1902, Trainmaster, Middle division, G.T.R.; May, 1902, to Sept., 1904, Superintendent, Denver and Rio Grande Ry.; Sept., 1904, to Jan., 1906, Superintendent, Cincinnati, Hamilton and Dayton Ry., Indianapolis, Ind.; Jan., 1906, to Sept. 30, 1907, Superintendent, Kansas City Southern Ry.; Sept. 30, 1907, to Oct. 17, 1912, Superintendent, Eastern division, G.T.R., Montreal.

C. T. DELAMERE, whose appointment as Assistant District Engineer, Canadian Northern Ontario Ry., Montreal-Port Arthur lines, Port Arthur district, was announced in a recent issue, was born at Brainerd, Minn., Mar. 18, 1881, and graduated in civil engineering from Minnesota university, in 1903. He entered railway service in 1903, since when he has been, to 1904, transitman, Northern Pacific Ry.; 1904 to 1905, Resident Engineer, same road; 1905 to 1908, Division Engineer, same road; 1908 to 1909, Locating Engineer, Western Dakota Ry.; 1909 to 1911, Division Engineer, same road; 1911 to July, 1912, Resident Engineer and Division Engineer, C. N. Ontario Ry.

J. D. McDONALD, Assistant General Passenger Agent, Grand Trunk Ry., Chi-

eago, left there, Sept. 8 with his wife and daughter on the American Association of General Passenger and Ticket Agents' special train for Seattle, Wash., where the Association's annual meeting was held, and the party proceeded to Victoria and Vancouver where they were entertained on behalf of the C.P.R. by H. W. Brodie, Assistant General Passenger Agent. After returning with the Association to Tacoma, Wash., Mr., Mrs. and Miss McDonald went to Prince Rupert, B.C., and to the end of steel on the G.T.P.R. east of that point, and then visited Lower California, returning to Chicago, Oct. 6.

PATRICK DUBEE, Secretary-Treasurer, Montreal Tramways Co., and President Canadian Street Railway Association, while attending the American Electric Railway Association convention in Chicago early in October, was summoned back to Montreal, owing to the death of his father-in-law, Matthew Dineen. Mr. Dineen came from Ireland some 50 years ago, and was one of the pioneer landscape gardeners in Montreal. Some 35 years ago he became a contractor and did a large amount of civic work, especially sewer and conduit construction. He was warden of St. Patrick's church for some 30 years and one of the oldest members of St. Patrick's Society, being also associated with St. Ann's Total Abstinence Society.

J. B. GRAY, whose appointment as Superintendent, Sleeping, Dining and Parlor Cars and News Service, C.P.R., lines east of Toronto and Sudbury, Ont., Montreal, was announced in our last issue, was born in July, 1876, and entered the Pullman Co.'s service in 1893 as junior clerk in the dining car store room, remaining in that department in various capacities in several large U. S. cities, until 1895, when he was appointed Assistant Commissary at Chicago, Ill. He remained there until 1909, when he was appointed Assistant Superintendent, Sleeping Car Department, at Portland, Ore., which position he held up to the time of his appointment as Assistant Superintendent, Sleeping, Dining and Parlor Cars and News Service, C.P.R., Calgary, Alta.

R. A. BARRETT, who has been appointed Superintendent, Toronto, Hamilton and Buffalo Ry., Hamilton, Ont., was born at Berlin, Ont., Aug. 26, 1870, and entered railway service, 1884, since when he has been, to 1888, in various positions in the Michigan Central Rd. offices at St. Thomas, Ont.; 1888 to 1891, in various positions in the yards, same road, St. Thomas, Ont.; 1891 to 1897, General Yardmaster, same road, St. Thomas, Ont.; 1897 to 1898, road conductor, same road; 1898 to Feb., 1901, Assistant Trainmaster, same road, Montrose, Ont.; Feb., 1901 to July, 1911, Trainmaster, M.C.R. lines between Suspension bridge, Buffalo and St. Thomas; July, 1911, to Oct. 1, 1912, Trainmaster, T.H. & B.R., Hamilton, Ont.

T. DAVIES, who has been appointed Chief Dispatcher, district 1, Canadian Northern Ry., Port Arthur, Ont., was born at Bangor, Wales, June 17, 1878, and entered railway service, Aug., 1892, since when he has been, to Apr., 1894, call boy, C.P.R., Medicine Hat, Alta.; Apr., 1894, to Apr., 1895, car checker, C.P.R., Medicine Hat, Alta.; May 1, 1895 to Aug., 1899, operator and agent at various points, C.P.R., between Medicine Hat, Alta., and Donald, B.C.; 1899 to 1902, operator and agent, various roads in the U.S.; Oct. 3, 1902, to Sept. 23, 1905, operator, Canadian Northern Ry., Winnipeg; Sept. 24, 1905, to Jan. 30, 1906, dispatcher, same road, Dauphin, Man.; Feb. 3, 1906, to Aug. 2, 1911, dispatcher, same road, North Battleford, Sask.; Aug. 3, 1911, to Sept. 11, 1912, dispatcher, same road, Winnipeg.

W. H. WINTERROWD, whose appointment as Mechanical Engineer, C.P.R., Angus locomotive shops, Montreal, was announced in our last issue, and whose portrait appears in this issue, was born at Hope, Ind., Apr. 2, 1884, and educated at Shelbyville, Ind., and Purdue University, whence he graduated in 1907. He entered railway service in 1905, since when he has been, to 1906, blacksmith helper, Lake Erie and Western Ry., Lima, O., 1906 to 1907, air brake and car repairman, Pennsylvania Rd. western lines, Dennison, O.; 1907 to 1908, special apprentice, Lake Shore and Michigan Southern Ry., Elkhart, Ind.; 1908 to 1909, Roundhouse Foreman, Lake Erie, Alliance and Wheeling Ry., Alliance, O.; 1909 to 1910, Night Roundhouse Foreman, Lake Shore, Michigan and Southern Ry., Youngstown, O.; 1910, Roundhouse Foreman, same road, Cleveland, O.; 1910 to Sept., 1912, Assistant to Mechanical Engineer, same road, Cleveland, O.

P302 W. C. Lancaster,
Electrical and Mechanical Engineer, Montreal Tunnel and Terminal Construction.

National Transcontinental Railway Construction.

An Ottawa press dispatch of Oct. 17 says that the Dominion Government has made arrangements for the putting in operation of the N.T. Ry. from Moncton, N.B., to Levis, Que., and that Intercolonial Ry. rolling stock will be used. It is expected that the section from Cochrane, Ont., the junction with the Timiskaming and Northern Ontario Ry., to Lake Superior Jct., will be ready for temporary operation early in November. From Lake Superior Jct. to Winnipeg the line is already being operated by the G.T. Pacific Ry. under an agreement. The question of the taking over of that section of the line by the G.T.P. Ry. has not yet been settled. (Oct., pp. 506.)

Grand Trunk Pacific Railway Construction.

According to a report of work done to Sept. 30, 159 stations have been located on the main line between Winnipeg and Fitzhugh, Alta. Of these 69 have been completed, 44 are under construction, and preparations are being made for starting the remaining 46.

The Board of Railway Commissioners has approved of revised location for the line from mileage 347.5 to 372.4 east of Prince Rupert; through the Noon-la Indian reserve, mileage 395 east of Prince Rupert; to the boundaries of the Sa-La-Quo Indian reserve, mileage 449.18 to 452.94 east of Prince Rupert; and mileage 49.26 to 59.17 in the Fort George District.

GRAND TRUNK PACIFIC RAILWAY BRANCH LINES.

Application is being made to the Dominion Parliament for an act extending the time within which to complete the construction of the several lines authorized to be built by the acts of 1906, 1909, 1910 and 1911.

Local press reports state that the company has acquired a considerable area of property on McKellar street, Fort William, Ont., on which it is proposed to lay out freight sheds, etc. The property is said to be two city blocks in extent.

A considerable area of property is reported to have been acquired to the south east of Brandon, Man., on which, it is stated, the company will lay out terminal yards for the use of its Harte-Brandon branch now under construction.

Two station buildings are reported to five others to be under construction. This branch runs northerly from Nielville, Sask. On the branch southwesterly to Regina, four stations are reported to have been completed, and three more to be under construction.

The Board of Railway Commissioners has authorized the opening for traffic of the branch line from Regina to the International boundary, from Regina to Talmage, Sask., mileage, 66.5. The Board has also approved of revised location plans for the line from sec. 11, tp. 7, range 10, to sec. 13, tp. 3, range 4, west second meridian, mileage 91.13 to 135.93.

It was reported that on Sept. 30 there were three station buildings under construction on the branch line from Young to Prince Albert, Sask., and that plans for 16 other standard stations had been prepared.

The Board of Railway Commissioners has authorized the building of a connection between the terminus of the branch line from Oban, in Battleford, Sask., and the starting point of the line from Battleford into the Cutknife district. The Board has authorized the establishment of terminals in Battleford. It has also approved of revised location plans for the Cutknife branch through sec. 36, tp. 43, range 18, west of 3rd meridian.

Construction department reports state that on Sept. 30 four station buildings had been completed on the branch out of Tofield to Calgary, Alta., and that three others were under construction. Track is reported to have been laid to Irricana, and the grading to have been completed into Calgary. At the crossing of the Bow river, about four miles out of Calgary, a steel bridge is being erected by the Canadian Bridge Co., It is expected that this will be completed, and steel laid into Calgary early in November. The Board of Railway Commissioners has approved of revised location plans for the line south of Calgary towards the International boundary, from n.e. ¼ sec. 12, tp. 13, r. 24, to n.w. ¼ sec. 34, tp. 11, r. 23. w. 4 m., mileage 81.41 to 90.43, South Alberta district.

The Board of Railway Commissioners has authorized the opening for traffic of the Alberta coal branch from mileage 0 to 36.6. This line starts at Bickerdike, on the main line, and runs southwesterly to the coal fields in the Brazeau river district. (Oct., pg. 507.)

Transportation Appointments Throughout Canada.

The information under this head, which is almost entirely gathered from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who may notice any error in our announcements will confer a favor by advising us.

Bellingham Bay and British Columbia Rd.—J. S. GOLITHON has been appointed Master Mechanic, vice J. A. Haley, resigned. Office, Bellingham, Wash.

Canada and Gulf Terminal Ry.—J. E. PINAULT has been appointed Superintendent, vice J. R. Cassidy, resigned. All traffic employes report direct to him on all matters pertaining to their duties; agents and conductors continue to report returns, collections, etc., to T. J. Lyons. Office, Matane, Que.

P248 U. E. Gillen,
Superintendent, Eastern Division, Grand Trunk Railway.

Canadian Northern Ry.—J. C. O'DONNELL, heretofore Trainmaster, district 2, Winnipeg, has been appointed Trainmaster, district 1, Rainy River, Ont., vice G. W. Chapman, assigned to other duties.

I. L. BOOMER, heretofore Chief Dispatcher, district 1, Port Arthur, Ont., has been appointed Trainmaster, Port Arthur subdivision, with jurisdiction over Port Arthur and Atikokan terminals, vice G. Darrah. Office, Port Arthur, Ont.

T. DAVIES has been appointed Chief Dispatcher, district 1, Port Arthur, Ont., vice I. L. Boomer, promoted.

A. E. COX, heretofore Storekeeper, Winnipeg, has been appointed General Storekeeper for all lines west of Port Arthur, Ont. Office, Winnipeg.

G. A. GLAY, heretofore conductor, has been appointed Trainmaster, district 2, Winnipeg, vice G. W. Chapman, who succeeded J. C. O'Donnell, and subsequently resigned.

Canadian Pacific Ry.—D. L. JONES, who has been acting as Master Mechanic, Atlantic division, McAdam jct., N.B., during the absence on sick leave of C. R. Ord, has resumed his duties as District Master Mechanic, districts 1 and 2, Woodstock, N.B., Mr. Ord having returned.

J. F. GILDEA, heretofore Locomotive Foreman, Schreiber, Ont., has been appointed Locomotive Foreman, Hochelaga, Montreal, vice J. Wilkinson.

J. SKINNER, heretofore ticket agent at Owen Sound, Ont., has been appointed city passenger, ticket and telegraph agent, Peterboro, Ont.

E. J. MURPHY, heretofore Locomotive Foreman, John street yards, Toronto, has been appointed Assistant Foreman, West Toronto.

D. L. DERROW has been appointed Locomotive Foreman, John street yards, Toronto, vice E. J. Murphy, transferred.

W. McILROY, heretofore ticket agent at Peterboro, Ont., has been appointed city passenger and ticket agent, Hamilton, Ont.

W. H. WALKER has been appointed night locomotive foreman at Fort William, Ont., vice A. Brown, promoted.

P. S. LINDSAY, heretofore District Master Mechanic, district 3, Manitoba division, Brandon, has been appointed District Master Mechanic, district 2, Manitoba division, vice A. G. Hebb, transferred. Office, Winnipeg.

L. FISHER, heretofore District Master Mechanic, district 4, Manitoba division, Souris, has been appointed District Master Mechanic, district 3, Manitoba division, vice P. S. Lindsay, transferred. Office, Brandon.

A. G. HEBB, heretofore District Master Mechanic, district 2, Manitoba division, Winnipeg, has been appointed District Master Mechanic, district 4, vice L. Fisher, transferred. Office, Souris.

H. J. HUMPHREY has been appointed Car Service and Fuel Agent, Saskatchewan division, vice R. A. Gamble. Office, Moose Jaw.

R. COOPER, heretofore Assistant Car Foreman, has been appointed Car Foreman at Moose Jaw, Sask., vice J. B. Shelton, who has left the service.

A. H. MIDDLETON has been appointed Assistant Car Foreman at Moose Jaw, Sask., vice R. Cooper, promoted.

A. McARTHUR, heretofore Locomotive Foreman, Fort William, Ont., has been appointed Locomotive Foreman, Sutherland, Sask., vice J. Sindall, transferred.

W. THOMAS, heretofore assistant chief clerk, has been appointed chief clerk to General Superintendent, Alberta division, C.P.R., Calgary, vice R. J. Lydiatt.

E. W. DEMER has been appointed Storekeeper at Macleod, Alta. This is a new position.

J. SINDALL, heretofore Locomotive Foreman, Sutherland, Sask., has been appointed Shop Foreman, Cranbrook, B.C.

T. S. BERTRAM has been appointed Roundhouse Foreman, Revelstoke, B.C., vice R. Millar, acting Roundhouse Foreman, assigned to other duties.

C. BROWN, heretofore Roundhouse Foreman, Vancouver, has been appointed Locomotive Foreman, North Bend, B.C., vice W. E. Hayward, appointed Roundhouse Foreman, Vancouver.

W. E. HAYWARD, heretofore Locomotive Foreman, North Bend, B.C., has been appointed Roundhouse Foreman, Vancouver, vice C. Brown, appointed Locomotive Foreman, North Bend.

Dominion Atlantic Ry.—F. VAN BLARCOM has been appointed Locomotive Foreman at Kentville, N.S. The titles of Mechanical Superintendent, formerly held by W. Yould, and Master Mechanic, formerly held by J. H. Yould (now Superintendent of Motive Power) have been abolished.

Grand Trunk Pacific Ry.—A. S. WRIGHT has been appointed Locomotive Foreman at Regina, Sask., vice A. J. Roberts, resigned.

J. NESS has been appointed Car Foreman, Regina, Sask.

C. E. STEWART has been appointed Locomotive Foreman at Biggar, Sask., in charge of locomotive and car departments, vice G. M. Carruthers, assigned to other duties.

G. M. CARRUTHERS, heretofore Locomotive Foreman, Biggar, Sask., has been appointed night foreman, Melville, Sask.

The following agents have been appointed, —Gerald, Sask., R. W. Gibson; Ituna, Sask., G. C. Smart; Leney, Sask., W. J. Reid; Stony Plain, Alta., R. L. Williams; Bickerdike, Alta., W. A. Bishop; Fitzhugh, Alta., R. C. Harmon; Reford, Sask., T. Hutchings; Dandurand, Sask., A. E. Robin; Lebret, Sask., R. N. McNabb.

Grand Trunk Ry.—U. E. GILLEN, heretofore Superintendent, Middle division, Toronto, has been appointed Superintendent, Eastern division, vice H. E. Whittenberger, transferred to Toronto. Office, Montreal.

G. W. CLARK has been appointed Locomotive Foreman, St. Lambert, Que.

W. H. WALKER, heretofore Locomotive Foreman at Brockville, Ont., has been appointed Locomotive Foreman at Turcot, Que., vice J. D. Scott, resigned.

L. J. McLAUGHLIN has been appointed Locomotive Foreman at Brockville, Ont., vice W. H. Walker, transferred.

H. E. WHITTENBERGER, heretofore Superintendent, Eastern division, Montreal, has been appointed Superintendent, Middle division, vice U. E. Gillen, transferred to Montreal. Office, Toronto.

W. H. FARRELL, Superintendent of Terminals, is in Montreal, apparently temporarily, in connection with terminal work there. A Montreal press dispatch of Oct. 25 states that he has been appointed Superintendent of all G.T.R. terminals, with headquarters at Montreal.

P303 H. E. Whittenberger,
Superintendent, Middle Division, Grand Trunk Railway.

G. STOKES, heretofore Yardmaster, Don yard, Toronto, who was recently appointed General Yardmaster, Toronto terminals, vice J. McCormick, has since been appointed acting Terminal Superintendent, Toronto, while W. H. Farrell is absent in Montreal.

G. A. METLER has been appointed Yardmaster, Don yard, Toronto, vice G. Stokes, promoted.

L. E. WRIGHT has been appointed town ticket agent at Collingwood, Ont.

J. J. KNIGHT, heretofore agent at Exe-

ter, Ont., has been appointed Local Freight Agent, Guelph, Ont., vice W. F. Briggs, transferred to Brantford, Ont.

W. F. BRIGGS, heretofore Local Freight Agent, Guelph, Ont., has been appointed Freight Agent at Brantford, Ont.

T. J. CASSIDY, heretofore dispatcher, has been appointed Chief Dispatcher, St. Thomas, Ont., vice W. J. Hogan, promoted.

W. J. HOGAN, heretofore Chief Dispatcher, St. Thomas, Ont., has been appointed Master of Transportation, Western division, vice G. W. Gillespie, transferred. Office, Durand, Mich.

J. A. CLANCEY has been appointed Assistant Superintendent of Terminals, Milwaukee jct., Mich.

The following agents have been appointed, —Huntingdon, Que., W. A. Hunter; Whites, Que., E. E. Bourdon; Jacques Cartier jct., Que., L. Rainville; Anson jct., Ont., F. E. Hutchinson; Caledonia, Ont., H. Rose; Jordan, Ont., N. G. Case; Bright, Ont., M. J. Byrne; St. Polycarpe jct., Que., W. Hardy; Rainy Lake, Ont., J. M. Smith.

Great Northern Ry.—J. M. GRUBER, heretofore General Manager, has been appointed Vice President in charge of operation. Office, St. Paul, Minn.

W. P. KENNEY, heretofore General Traffic Manager, has been appointed vice President in charge of traffic. Office, St. Paul, Minn.

G. H. EMERSON, heretofore Assistant General Manager, has been appointed General Manager, vice J. M. Gruber, promoted. Office, St. Paul, Minn.

Intercolonial Ry.—JOHN JOHNSON has been appointed Roundhouse Foreman, Sydney, N.S., vice D. McLennan, assigned to other duties.

Press reports state that the office of Chief Engineer has been abolished and that W. B. MACKENZIE has been appointed Right of Way and Lease Agent.

Michigan Central Rd.—J. F. DEIMLING, heretofore Chief Engineer, Pere Marquette Rd., Detroit, Mich., has been appointed Engineer of Construction, M.C.R. Office, Detroit, Mich.

A. L. SARVEY, heretofore Grade Separation Engineer, has been appointed Assistant Chief Engineer, vice F. B. Marble, resigned. Office, Detroit, Mich.

E. M. WALKER has been appointed Grade Separation Engineer, vice A. L. Sarvey, promoted. Office, Detroit, Mich.

A. K. GALLOWAY, heretofore Roundhouse Foreman, St. Thomas, Ont., has been appointed General Foreman, Detroit locomotive terminals, Detroit, Mich.

G. R. GALLOWAY, heretofore Roundhouse Foreman, Montrose, Ont., has been appointed Roundhouse Foreman, St. Thomas, Ont., vice A. K. Galloway, promoted.

J. R. SANDS, heretofore machinist, has been appointed Roundhouse Foreman, Montrose, Ont., vice G. R. Galloway, transferred.

Minneapolis, St. Paul and Sault Ste. Marie Ry.—H. B. DIKE, General Solicitor, who has been appointed Assistant to the President, as announced in our last issue, will have such special duties as may be assigned to him from time to time. Office, Minneapolis, Minn.

C. N. KALK, heretofore Principal Assistant Engineer and Signal Engineer, has been appointed Chief Engineer, vice T. Greene, deceased. Officer, Minneapolis, Minn.

S. B. NOBLE has been appointed Travelling Passenger Agent, with headquarters at 299 Broadway, New York City. This is a new position.

T. A. HAVERSTAD has been appointed Agricultural Commissioner, Minneapolis, Minn. This is a new position.

F. R. SMALLEY has been appointed Travelling Agent, with headquarters at 379 Robert street, St. Paul, Minn., vice H. T. Duffy, promoted.

B. C. HARRISON has been appointed District Passenger Agent, with headquarters at 222 Bannatyne avenue, Winnipeg, Man.

H. T. DUFFY, heretofore Travelling Agent, St. Paul, Minn., has been appointed District Passenger Agent, Portland, Ore., vice G. Taylor, resigned. Office, corner of Third and Pine streets.

New York Central and Hudson River Rd.—S. R. PAYNE, heretofore General Superintendent, Western district, Syracuse, N.Y., has been appointed Assistant to General Manager, performing such duties as may be assigned to him. Office, Rochester, N.Y.

T. W. EVANS, heretofore Superintendent, Buffalo division, Buffalo, N.Y., has been appointed General Superintendent, Western district, vice S. R. Payne, promoted. Office, Syracuse, N.Y.

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A. E. Cox,
General Storekeeper, Canadian Northern Railway.

Pere Marquette Rd.—W. L. KELLOGG Superintendent of Motive Power, has had his office moved from Detroit to Wyoming, and will have direct charge of the shops there, and a general supervision over the motive power and car department.

H. O. HALSTEAD, heretofore Superintendent of Transportation, Detroit, Mich., has been appointed Superintendent, Detroit division, comprising the line from Detroit to Grand Rapids, including Detroit terminals and Detroit-Windsor ferry operation. Office, Detroit.

X. H. CORNELL, heretofore Superintendent of Transportation, Chicago and Alton Rd., Chicago, Ill., has been appointed Superintendent of Transportation, Pere Marquette Rd., vice H. O. Halstead, assigned to other duties. Office, Detroit, Mich.

S. A. CHAMBERLIN, heretofore Master Mechanic, Grand Rapids, Mich., has been appointed Master Mechanic, Saginaw, Mich., vice F. C. Pickard, resigned.

Toronto, Hamilton and Buffalo Ry.—R. A. BARRETT, heretofore Trainmaster, Hamilton, Ont., has been appointed Superintendent. Office, Hamilton.

Canadian Northern Railway Construction, Betterments, Etc.

Canadian Northern Quebec Ry.—It is expected that the new car and machine shops at Limoilou, a suburb of Quebec, will be completed by Nov. 30. Nothing definite has yet been decided as to the company's terminals in Quebec, but negotiations are going on between the city and the company, and how they will turn out depends a good deal upon what will be done by the Dominion Government in connection with the terminals for the National Transcontinental Railway. The C.N.Q. Ry. has a large area of land at Cap Rouge, and it is said that this is to be developed for the company's steamships harbor.

Canadian Northern Montreal Tunnel and Terminal Co.—Supplemental letters patent have been granted under the Dominion Companies Act increasing the capital from $50,000 to $5,000,000.

The shaft at Maplewood Ave. is reported completed, and preparations are being made for starting driving the tunnel north and south from it. This will make four headings at work driving.

The Montreal city council is in favor of the Board of Railway Commissioners deciding the question of the overhead line from Lagauchetiere street to the water front.

Montreal-Ottawa-Port Colborne Line.—The Board of Railway Commissioners has approved of location plans for the line through Jacques Cartier and Hochelaga counties and part of Montreal, mileage 43.56 to 55.23 from Hawkesbury.

It is expected that the grading on the section of the line out of Ottawa to Fitzroy harbor on the Ottawa river will be completed this fall.

The Board of Railway Commissioners has authorized the C.N.O. Ry. to cross the Algoma Eastern Ry. with its main line extension to the Algoma Eastern Ry. on lot 6, con. 4, McKim tp., Sudbury district.

The Board of Railway Commissioners has approved of revised location plans for the line from mileage 278.11 to 280.11, and from 283.76 to 285.72 from Port Arthur, Ont.

Canadian Northern Ontario Ry.—It is expected that the line from Ottawa to Toronto will be completed this year. With the exception of the bridges over the Rideau and Joch rivers, the section between Ottawa and Smiths Falls is practically ready for track laying. This work is to be started early in November. The section between Harrowsmith, the end of the Bay of Quinte Ry., which is incorporated in the line to Smiths Falls, is well advanced towards completion.

Toronto - Hamilton - Buffalo Line.—The Board of Railway Commissioners has authorized the building of the line across the C.P.R. at Lambton, mileage 6.13 from Yonge street, Toronto; the building of a bridge across the Humber river, mileage 6.32 west of Yonge street, Toronto; and of the location of the line through Saltfleet tp., mileage 45.17 to 54.21.

Canadian Northern Ry.—The Board of Railway Commissioners has approved of revised location of the proposed connection of the International Bridge and Terminal Co.'s line with the C.N.R. at Fort Frances. Ont.

It is reported that work is to be started at once on what is known as the Fort Rouge cut off, south of Winnipeg. A temporary trestle bridge will be erected across the Red river, and the reports state that the cut off will be completed by the end of November.

The Board of Railway Commissioners has approved of location plans for a line

through tps. 4-7, range 1 east of the first meridian to range 2 west of the first meridian, mileage 0 to 18.08.

Tenders are under consideration for the building of a 256 ft. extension to the freight shed at Brandon, Man. R. B. Pratt, Winnipeg is architect.

The Board of Railway Commissioners has approved of location plans for the line through tps. 43 and 44, range 4, west of the 3rd meridian, Sask., mileage 28.18 to 37.96.

The Alberta Government has approved of the route map of a line from Hanna to Medicine Hat, Alta. It is stated that construction will be started at Medicine Hat at an early date. The line, it is stated, will connect with the main line near Bruderheim.

Track is reported to have been laid on the branch line from Edmonton to Camrose, on the Vegreville-Calgary line for 16 miles. It is expected that the line into Calgary will be completed this year. Steel has been laid, it is reported, to within 12 miles of Calgary, and on Oct. 16 it was stated that the city council had agreed to give the company all the facilities necessary. The bridge over the river to carry the line right into the centre of the city is to be completed by Oct., 1913. Grading is reported to have been completed on the line from Saskatoon to Berry creek, 240 miles, and track has been laid for 220 miles. This line is to connect with the Vegreville-Calgary line at Drumheller. It is expected to complete 50 miles of the line south of Calgary this year.

The Board of Railway Commissioners has approved of revised location plan for the line through tp. 46, range 1, west of the 6th meridian, mileage 224.66 to 228.36. This is described as being a line of the C.N. Alberta Ry.

An agreement is reported to have been reached between the city and the company, under which the terminal station, etc., in Edmonton, Alta., is to be erected during 1913.

Canadian Northern Pacific Ry.—We are officially advised that the following subcontracts have been let by the Northern Construction Co., on the line west of Yellowhead Pass, B.C.:—Mileage 0 to 10, Phelan and Shirley mileage 10 to 18, Sieurs-Carey Co.; mileage 18 to 34, Palmer Bros. and Henning; mileage 34 to 39, S. B. Hogan; mileage 49 to about 160 miles north of Kamloops, Palmers Bros. and Henning. This section of the work is being done under the supervision of the general contractors' Edmonton office, the remaining mileage to Port Mann being handled from Vancouver.

It is said from a letter received Oct. 2, by the mayor of Kamloops, B.C., that a divisional point is to be located there. The description and plan of the proposed bridge across the North Thompson river near Kamloops, already described in our columns, have been filed with the Public Works Department at Ottawa.

Tenders are under consideration for the building of lines to be known as the Okanagan branches. The starting point is at Kamloops, B.C., on the main line, and the first section extends to Vernon, 83 miles, while the second extends from Vernon and Lumley to Kelowna, 48 miles. Contractors were asked to tender separately on each section and to give alternative prices for grading based on the following classifications:—A.—Solid rock; loose rock; bard pan; earth. B.—Solid rock; all other material. The work is to be completed within a year from signing of contract.

The Vancouver city council, Oct. 1, adopted an agreement with the company as to the False creek property to be utilized as terminals, and a bylaw is being prepared for submission to the ratepayers.

Lines on Vancouver Island.—We are officially advised that the 40 mile contract referred to in our last issue as having been let to the Northern Construction Co., has been handed over to Murdoch Co. Work has been started at the Alberni end, and it is expected to have it completed in a year.

Plans have been approved by the British Columbia Government for a line from mileage 100, near Cowichan lake, to mileage 210 on Quinsam river.

The Premier of British Columbia is reported as stating, Oct. 4, that an agreement had been reached with the company as to terminals in Victoria, and that the details will be laid before the Legislature. (Oct., pg. 510.)

Canadian Pacific Railway Betterments, Construction, Etc.

St. John Terminals.—Press reports state that the company is negotiating with the city council of St. John, N.B., for a strip of land at Fourville station for the erection of additional office buildings.

Place Viger Improvements.—It is reported that a contract has been let to the Canadian Stewart Co., for the erection of an addition to the Place Viger hotel, Montreal to give 140 extra guest rooms.

Ottawa Improvements.—D. McNicoll, Vice President, is reported as stating, Oct. 7, that the project for the building of a tunnel at Ottawa had not been abandoned as had been reported. Negotiations were going on with the Dominion Government, and everything depended upon their outcome. It was possible that there would be some change in the plans, but nothing definite could be said for some time.

Smiths Falls, Ont.—Press reports state that local firms have been asked to tender for the erection of a locomotive house and machine shop at Smiths Falls, Ont.

Campbellford, Lake Ontario and Western Ry.—The Board of Railway Commissioners has authorized a connection to be made with the Kingston and Pembroke Ry. at Parham station, mileage 24.8 from Glen Tay, Ont.; and has approved of revised location plans for the line from mileage 125.5 to 127.32.

North Toronto Grade Revision.—Tenders are under consideration for the construction of the substructure of the Avenue road subway, Toronto, a part of the grade separation work in North Toronto. B. Ripley is engineer in charge.

Sault Ste. Marie Branch Grade Revision.—The Board of Railway Commissioners has approved plans for the revision of the alignments and gradients of the Sudbury-Sault Ste. Marie branch, mileage 7.42 to 8.39 Webbwood section.

Bergen Northeasterly.—The Board of Railway Commissioners has approved of location plans for a line northeasterly from Bergen, Man., to lot 58, Kildonan parish. 9.92 miles.

Swift Current Bassano Cut Off.—We are officially advised that it is not intended to do any construction this year beyond the 80 miles at present under contract.

The Board of Railway Commissioners has approved revised location on this line from sec. 35, tp. 22, range 27, to sec. 17 tp. 23, range 29, mileage 93 to 111.9.

Irricana to Bassano.—Press reports state that the branch line from Irricana to Bassano, Alta., has been completed, and will be handed over to the operating department at an early date.

Lacombe Easterly.—The Board of Railway Commissioners has approved of location plans for the extension of the branch from Lacombe easterly from mileage 100.07 to 146.10. The line at present terminates at Monitor, Alta., and it will effect a junction with the Moose Jaw northwesterly line at Kerrobert.

New Southern Main Line.—In connection with the construction of various lines in Saskatchewan and Alberta, and the building of the Kettle Valley lines, which are being taken over by the C.P.R., western papers have published a map showing a new main line from Winnipeg to Vancouver. It is stated that this line would be nearly 400 miles shorter than the present line, and that the gradients through the Rocky mountains would be easier than on the line through Kicking Horse pass. The section of the line under construction in Saskatchewan and Alberta is an extension of the line westerly from Weyburn, now terminating at Viceroy, Sask., to Sterling, Alta.

Kaslo and Slocan Ry.—Press reports state that W. P. Tierney, contractor, has received instructions from the C.P.R. to complete the standardization of the K. and S. Ry. between Bear lake and Whitewater mine, and to carry on the work of standardizing the rest of the line during the winter. The work includes, besides the alteration of the dump from narrow to standard gauge, the reduction of gradients, and the straightening out of curves. The recently completed spur line from the C.P.R. at Three Forks connects with the K. and S. Ry. at Bear lake. The Board of Railway Commissioners has authorized the opening for traffic of the line from Three Forks to Bear Lake, 5.2 miles.

Calgary to Vancouver Second Track.—We are officially advised that the contract for grading between Hammond and Ruby creek, B.C., has been let to Grant Smith and Co. and McDonnell, who have already put in their camps and started work. The portion between Hammond and Mission, 20 miles, will be completed by the end of this year. This stretch is light work, located along the Fraser river, with a few shovel cuts, the remainder being hand grading. Between Mission and Ruby creek the work is slightly heavier, with some rock work. There is one tunnel 440 ft. long, which will have to be widened for the second track, and a couple of small grade reductions which will give a ruling gradient of 0.4%. There is no heavy bridge work on this stretch, as all the sub-structures or permanent bridges have already been built to carry a second track, and the temporary bridges are being replaced with permanent structures this year. H. Rindal, Division Engineer, Vancouver, is in charge.

Car Ferry Barge.—A contract is reported to have been let to the British Columbia Marine Ry., Esquimalt, for the construction of a car ferry barge to be named Transfer No. 4. It will be a steel car ferry barge, 260 ft. long, 42 ft. beam, and 12 ft. deep, built to accommodate 15 loaded railroad cars. Unlike the Transfer No. 3, recently constructed at Esquimalt, the new barge will not be provided with holds to carry cargo. She will have three lines of rails, and all her cargo will be in the cars loaded on the deck. She will be amply provided with bulkheads, the plans providing for two longitudinal bulkheads and five transverse bulkheads. Accommodation for the crew will be provided by a house at the forecastle head, and a small donkey boiler will be provided to furnish steam for the windlass, pumps, etc. The barge will be provided with the requisite pumps and other gear. (Oct., pg. 504.)

Orders by the Board of Railway Commissioners.

Beginning with June, 1904, Canadian Railway and Marine World has published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed our paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates given of orders, immediately following the numbers, are those on which the orders took place, and not those on which the orders were issued. In many cases orders are not issued for a considerable time after the dates assigned to them.

17553. Sept. 24.—Approving Campbellford, Lake Ontario and Western Ry. (C.P.R.) location from mileage 125.5 from Glen Tay, southwesterly through Hope tp. and Hope, Ont., to mileage 127.3; and rescinding orders 16977, July 6, and 17330, Aug. 2.

17554. Sept. 24.—Authorizing C.P.R. to open for traffic its Nakusp and Slocan branch from Three Forks to Bear Lake, B.C., mileage 0 to 5.2.

17555. Sept. 23.—Authorizing C.P.R. to build spur for Maple Lake Lumber Co., west of Spragge tp., Ont.

17556. Sept. 24.—Authorizing C.P.R. to build spur 436 ft., northwesterly across Outremont yard, and across Montreal Light, Heat and Power Co.'s property, being of St. Laurent parish, Que.

17557. Sept. 23.—Approving location of C.N. Ontario Ry. station grounds at South March.

17558. Sept. 23.—Authorizing C.N. Ontario Ry. to build across public road, lot 9, con. 2, Gibbons tp., mileage 266.5 from Ottawa.

17559. Sept. 23.—Authorizing Canadian Northern Ry. to build between secs. 3 and 4, tp. 29, r. 7, w. 4 m., on its Goose Lake extension.

17560. Sept. 23.—Authorizing C.N. Ontario Ry. to build bridge across Stony Creek, Fitzroy tp., mileage 34.4 from Ottawa, and to divert Jimmys creek.

17561. Sept. 24.—Temporarily approving Western Canada Power Co. standard freight and passenger tariffs, C.R.C., B. 4, and A. 1.

17562. Sept. 25.—Authorizing Toronto, Hamilton and Buffalo Ry. to build spurs for National Steel Car Co., Hamilton, Ont.

17563. Sept. 25.—Authorizing G.T.R. to build siding for the Campbell Flour Mills Co., Toronto.

17564. Sept. 25.—Extending to Nov. 15 time within which Central Vermont Ry. shall ballast line between St. Lambert and Waterloo, Marieville and St. Cesaire, Farnham and Frielsburg, and Iberville and Farnham, Que.

17565, 17566. Sept. 24.—Approving Burrard Inlet Tunnel and Bridge Co.'s revised location from stations 0 to 174-88.7, and 4-56.3 to 324-32, B.C.

17567. Sept. 25.—Approving Esquimalt and Nanaimo Ry. plan of steel trestle across Arbutns canyon at bridge 14.9, B.C.

17568, 17569. Sept. 23.—Authorizing C.P.R. to build spur for Elmore and Snyder, near Lagan, B.C., and additional track across St. Thomas and Deschamps streets, Three Rivers, Que.

17570. Sept. 25.—Approving C.P.R. plan showing replacement of existing trestle at bridge 37.6, Walkerton subdivision, Ont.

17571. Sept. 23.—Authorizing C.P.R. to carry road allowance across its Reston to Wolseley branch at mileage 36.61, Sask.

17572. Sept. 24.—Amending order 16998, July 13, re C.P.R. spur at Longue Pointe, Que.

17573. Sept. 23.—Authorizing C.P.R. to build spur for J. C. Graham Co., St. John, Winnipeg.

17574. Sept. 25.—Authorizing C.P.R. to build spur for Cornellier and Joly, near Angus station, Que.

17575. Sept. 23.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build across and divert road allowance between lots 16 and 17, con. 1, Hope tp., mileage 129.68 from Glen Tay, Ont.

17576, 17577. Sept. 21, 25.—Authorizing Canadian Northern Ry. to build its Goose Lake extension between sec. 33, tp. 30, and sec. 3, tp. 31, p. 12, w. 4 m., and to build its Carlton branch across seven highways in Saskatchewan.

17578. Sept. 25.—Authorizing C.N. Quebec Ry. to divert St. Davide street, Hawkesbury, Ont., on s.e. and n.w. sides of its right of way.

17579, 17580. Sept. 23.—Approving C.N. Ontario Ry. revised location through unsurveyed territory, Algoma district, mileage 278.11 to 280.11, and 283.76 to 285.72 from Port Arthur.

17581 to 17583. Sept. 25, 24.—Authorizing C.N. Ontario Ry. to build across Etobicoke creek, mileage 10.98 west from Toronto, across public road on lot 2, con. 4, Crerar tp., and across public road between Field and Springer tps., Nipissing district.

17584. Sept. 23.—Authorizing C.N. Ontario Ry. to build bridge across Ground Hog river, mileage 149.7 from Sudbury Jct.

17585. Sept. 23.—Amending order 17006 re C.N. Ontario Ry. crossing of public road in Ste. Genevieve parish, Que., by substituting new plan.

17586. Sept. 23.—Authorizing C.N. Ontario Ry. to build across C.P.R. at Lambton, Ont., mileage 6.13 from Yonge street, Toronto, and rescinding order 16234, March 11, in same connection.

17587. Sept. 23.—Authorizing town of Pointeaux Trembles, Que., to extend Frontenac street across Canadian Northern Montreal Tunnel and Terminal Co.'s tracks.

17588. Sept. 23.—Authorizing Niagara, St. Catharines and Toronto Ry. to build spur for Montrose Paper Co., Thorold, Ont.

17589. Sept. 24.—Defining express delivery and collection limits in Maple Creek, Sask.

17590. Sept. 26.—Authorizing C.P.R. to build between Blanshard and East Nissouri tps., station 193.4, Ont.

17591. Sept. 25.—Authorizing C.P.R. to rebuild bridge 81.5 on its Woodstock subdivision, Ont.

17592. Sept. 24.—Approving revised location of C.P.R. Lacombe easterly branch from s.e. ¼ sec. 26, tp. 36, r. 12, mileage 100.07, to s.e. ¼ sec. 3, tp. 35, r. 5, w. 4 m., mileage 146.10, Alta.

17593. Sept. 26.—Approving replacement of C.P.R. span on bridge 18.9, Elora subdivision, Ont.

17594. Sept. 25.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to connect with Kingston and Pembroke Ry. (C.P.R.) at Parham station, mileage 24.8 from Glen Tay, Ont.

17595, 17596. Sept. 25.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build bridge 178.44 over public road, and to build across four highways, mileage 89.15 to 93.04 from Glen Tay, Ont.

17597. Sept. 26.—Approving revised location of G.T. Pacific Branch Lines Co., Calgary-Boundary branch from west line, n.e. ¼ sec. 12, tp. 13, r. 24, to south line n.w. ¼ sec. 34, tp. 11, r. 23, w. 4 m., mileage 81.41 to 90.43, South Alberta district.

17598. Sept. 28.—Authorizing G.T.R. to rebuild bridge 303 over Beaver river, milepost 107.46, district 14, Northern division, Ont.

17599. Sept. 26.—Approving revised location of G.T.R. siding for Western Foundry Co., Wingham, Ont.

17600. Sept. 25.—Authorizing G.T.R. to rebuild three bridges on its Middle division at milepost 44.61, Rockwood; 31.87, at Limehouse, and 122.84, at Sebringville, Ont.

17601. Sept. 26.—Authorizing C.N. Ontario Ry. to build across public road overhead on lot 44, con. 1, Camden tp.

17602. 17603. Sept. 26, 25.—Authorizing Alberta Interurban Ry. to build overhead structures across G.T. Pacific Branch Lines Co.'s Tofield-Calgary branch, and C.P.R. Langdon branch, sec. 2, tp. 28, r. 26, w. 4 m.

17604. Sept. 26.—Authorizing Edmonton, Dunvegan and British Columbia Ry. to connect with G.T. Pacific Ry., sec. 24, tp. 53, r. 25, w. 5 m.

17605. Sept. 24.—Approving C.N. Ontario Ry. location through Jacques Cartier and Hochelaga counties and part of Montreal, mileage 43.56 to 55.23 from Hawkesbury.

17606. Sept. 25.—Authorizing C.N. Ontario Ry. to build across Foresters creek, Ross tp., Ont.

17607. Sept. 26.—Authorizing G.T.R. to operate across the Montreal Park and Island Ry. near Turcot, Que.

17608. Oct. 1.—Authorizing Esquimalt and Nanaimo Ry. to build across four highways on its Comox extension, mileage 40.75 to 44.8 from McBride Jct., B.C.

17609. Sept. 26.—Approving revised location of International Bridge and Terminal Co.'s line, and connection with Canadian Northern Ry. in Fort Frances, Ont.

17610. Sept. 30.—Defining express delivery and collection limits in Summerside, P.E.I.

17611. Sept. 28.—Authorizing C.P.R. to build its Swift Current northwesterly branch across 80 highways in Alberta, mileage 0 to 84.98.

17612. Sept. 26.—Authorizing C.P.R. to build extension to spur for R. Laidlaw & Co., Toronto.

17613. Sept. 25.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build bridge 89.1 across public road.

17614. Sept. 28.—Amending order 17392, Aug. 30, re taking of G.T.R. lands by Campbellford, Lake Ontario and Western Ry. (C.P.R.) by changing Darlington tp. to Hope tp., Ont.

17615. Sept. 25.—Extending to Dec. 15 time within which G.T.R. shall complete bridge across Lachine road at Rockfield, Que.

17616. Sept. 26.—Authorizing Canadian Northern Ry. to build its Goose Lake extension between secs. 28 and 27, tp. 28, r. 6, w. 4 m.

17617. Sept. 25.—Approving G.T. Pacific Ry. station site at Miniota, Man.

17618. Sept. 25.—Dismissing G.T. Pacific Ry. application for authority to construct Y at mileage 29 west of Yellowhead pass.

17619. Sept. 25.—Ordering that joint freight rates to be charged by C.P.R., Canadian Northern Ry. and G.T. Pacific Ry. on lumber in carloads between Port Arthur and Fort William, Ont., and points on G.T.P.R. Lake Superior branch of G.T.P. be no higher than 1c per 100 lbs. over G.T.P.R. rates between Westfort, Ont., and Lake Superior branch points.

17620. Sept. 26.—Authorizing Central Vermont Ry. to rebuild bridge across Yamaska river near Farnham, Que.

17621. Sept. 30.—Authorizing Bay of Quinte Ry. to revise grade across two highways in Portland tp., Ont.

17622. Sept. 30.—Authorizing Heaps Brick Co. to cross Western Canada Power Co.'s tracks at Ruskin, B.C.

17623, 17624. Oct. 1.—Defining express delivery and collection limits in Fredericton, N.B., and Rouleau, Sask.

17625. Sept. 26.—Authorizing C.N. Ontario Ry. to build across two highways at mileage 221.09 and 224.54, Ferris tp., Nipissing district.

17626. Oct. 2.—Authorizing Esquimalt and Nanaimo Ry. to build spur from near intersection of Telegraph and Store streets, southwesterly across same, and lot 125, Victoria, B.C.

17627. Sept. 23.—Authorizing C.N. Ontario Ry. to build bridge across Humber river, York tp., mileage 6.32 west of Toronto.

17628. Sept. 30.—Authorizing Canadian Northern Montreal Tunnel and Terminal Co. to carry its tracks across Jacques Cartier and Union Ry. near Jacques Cartier Jct., Que.

17629. Sept. 28.—Certifying correction on plan and book of reference of Sept. 12 of revised location of Campbellford, Lake Ontario and Western Ry. (C.P.R.) across mill pond, Bowmanville, Ont.

17630. Oct. 2.—Authorizing C.P.R. to take 1,788 sq. ft. of certain lands for enlargement of its station grounds at St. Pie, Que.

17631. Oct. 2.—Authorizing C.P.R. to build extra track between sec. 3, tp. 15, and sec. 33, tp. 14, r. 15, w.p.m., at Neepawa, mileage 60.8 on Minnedosa subdivision, Man.

17632. Sept. 25.—Authorizing Kingston and Pembroke Ry. to build spur for North American Smelting Co., Kingston, Ont.

17633. Oct. 2.—Authorizing Toronto Suburban Ry. to build under C.P.R. at Mimico river in lot 8, con. B, Etobicoke tp., Ont.

17634. Oct. 4.—Authorizing G.T.R. to rebuild four bridges; over Little Sable river, mileage 121.08; Hamilton creek, mileage 151.18; O'Gradys creek, mileage 153.28, and over stream, mileage 159.52, on Middle division, Ont.

17635. Sept. 27.—Authorizing Ottawa Electric Co. to erect its wires across C.P.R. at Carleton street.

17636. Oct. 1.—Approving location Toronto, Hamilton and Buffalo Ry. passenger station at Silverdale.

17637. Oct. 2.—Authorizing Alberta Interurban Ry. to build across C.P.R. Calgary-Edmonton branch overhead in sec. 13, tp. 24, r. 1, w. 5 m., South Alberta district.

17638. Oct. 4.—Approving C.N. Quebec Ry. plan of span to replace present timber trestle over Montreal Terminal Ry., Bout de L'Ile, mileage 12 from Montreal.

17639. Sept. 26.—Authorizing C.N. Ontario Ry. to cross Algoma Eastern Ry. with its main line extension on lot 6, con. 4, McKim tp, Sudbury district.

17640. Oct. 3.—Extending to Dec. 15 time within which C.P.R. shall complete spur for American Lumber Co. at Sumas Jct., B.C.

17641. Oct. 4.—Approving C.P.R. plan showing replacement of double tracking of bridge 63.3 by 30 ft. deck plate girder span at Lac du Bonnet subdivision.

17642. Oct. 4.—Authorizing C.P.R. to build two spurs in block 1, Calgary, Alta.

17643. Oct. 3.—Approving location and type of G.T.R. station at Gobles, Ont.

17644, 17645. Oct. 4.—Authorizing G.T.R. to build branch for W. Gracey and Sons, and siding for Queen City Oil Co., Barrie, Ont.

17646. Oct. 3.—Authorizing G.T. Pacific Branch Lines Co. to carry traffic over its Regina-Boundary branch between Regina and Colfax, mileage 0 to 47.9, Sask.

17647. Oct. 4.—Authorizing city of St. Catharines, Ont., to build Berryman avenue across G.T.R. and Niagara, St. Catharines and Toronto Ry.

17648. Oct. 4.—Amending order 17405, Sept. 4, which required derails to be placed on British Columbia Electric Ry., and interlocked with semaphores on Vancouver, Fraser Valley and Southern Ry. by providing that all interurban cars and cars operating on Nanaimo street be stopped before making the crossing at First avenue, Vancouver.

17649 to 17651. Oct. 3.—Authorizing Esquimalt and Nanaimo Ry. to build spurs for B.C. Pottery Co., Ltd.; J. E. Painter and Sons, and Sweeney Cooperage Co., Victoria, B.C.

17652. Oct. 3.—Authorizing G.T.R. to build siding for the Bechtels Ltd., Waterloo tp., Ont.

17653. Oct. 3.—Authorizing C.P.R. to build spur for Canadian Western Natural Gas, Light, Heat and Power Co., Calgary, Alta.

17654, 17655. Oct. 4.—Ordering C.P.R. to place watchman at Stone road, Galt, Ont., between 7 a.m. and 6 p.m.; and to install automatic electric bell at Peterboro street, Norwood, Ont.

17656. Oct. 3.—Authorizing G.T.R. to rebuild bridge 39 on Middle division, 3.97 miles from Tavistock, Ont.

17657. Sept. 24.—Authorizing G.T. Pacific Ry. to build its Lake Superior branch across Port Arthur and Fort William Electric Ry. at Syndicate avenue, Fort William, Ont.

17658. Oct. 2.—Authorizing G.T. Pacific Branch Lines Co. to build its Brandon branch across six highways, mileage 13.9 to 18.2, Manitoba.

17659. Oct. 3.—Ordering G.T.R. to keep watchman during June, July, Aug. and Sept. at crossing of Georgian Bay and Seaboard Ry. (C.P.R.), at Tecumseh street, Orillia, Ont.

17660. Sept. 25.—Relieving G.T. Pacific Ry. from stopping its trains at King street, Entwistle, Alta., and from handling its freight traffic at sawmill siding.

17661. Oct. 3.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build across Scucog street, Bowmanville, Ont., mileage 149.2, crossing to be protected by gates.

17662. Sept. 3.—Authorizing G.T.R. to build spur for Battle Creek Toasted Corn Flake Co., London tp., Ont.

17663. Sept. 7.—Authorizing C.P.R. to build additional track under Clavet and Nelson streets and across Stephen street, Port Arthur, Ont., by extending overhead bridge.

17664. Oct. 7.—Authorizing C.P.R. to build its Bassano to Irricana branch across 15 highways from mileage 36.8, near Standard, to mileage 50.3, near Hussar, Alta.

17665. Oct. 4.—Approving proposed deviation of Nipissing Central Ry. between Cobalt and North Cobalt, Ont.

17666. Oct. 7.—Approving location Interprovincial and James Bay Ry. (C.P.R.) from mileage 0 to 10.11, through Geandreau and Mercier parishes, Que.

17667. Oct. 4.—Relieving Kingston and Pembroke Ry. (C.P.R.) from erecting fences along certain portions of its line.

17668. 17669. Oct. 7.—Authorizing G.T.R. to take certain lands in St. Antoine ward, Montreal; and ordering it to protect all shunting movements by sending a man ahead over switch with Central Ontario Ry. at subway leading from Murray tp., and Frankford to Trenton, Ont.

17670. Oct. 7.—Authorizing Algoma Eastern Ry. to build spur from mileage 9.08 through lot 9, con. 3, Snider tp., to the North Star mine.

17671. Oct. 7.—Authorizing C.P.R. to build three spurs for Sand and Supplies, Ltd., North Dumfries tp., Ont.

17672. Oct. 8.—Approving C.N. Alberta Ry. revised location through tp. 46, r. 1, w. 6 m., mileage 224.66 to 228.36.

17673. Oct. 8.—Approving Canadian Northern Ry. location through tps. 4-7, r. 1, e.p.m., Manitoba, mileage 0 to 19.08.

17674 to 17676. Oct. 7.—Authorizing C.N. Ontario Ry. to build across public road between lots 242 and 245 at station 1622-10, St. Eustache parish, Que.; to build across two highways on its Montreal-Port Arthur line in Ferris tp., Ont., and to build bridge across Ottawa river at Fitzroy harbor, mileage 37.32 west of Ottawa.

17677, 17678. Oct. 7, 9.—Authorizing G.T.R. to build siding for J. K. Kidd, Mount Bridges, Caradoc tp., and six additional sidings across Robert street, and public lane from Elgin street to Ferguson avenue, Hamilton, Ont.

17679. Oct. 8.—Approving revised location G.T. Pacific Branch Lines Co.'s Regina-Boundary branch from east line, sec. 11, tp. 7, r. 10, to east line, sec. 13, tp. 3, r. 4 w. 2 m., mileage 91.12 to 125.93, Canuington district, Sask.

17680. Oct. 7.—Authorizing G.T.R. to build siding for Canada Pine Lumber Co., Bethune tp., Ont.

17681. Oct. 8.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build across 20 highways from mileage 167.35 to 177.20.

17682. Oct. 9.—Authorizing G.T. Pacific Branch Lines Co. to build its Regina-Boundary branch across highway in n.e. ¼ sec. 11 tp. 17, r. 20, w. 2 m., at mileage 1.4, Assiniboia district, Sask.

17683. Oct. 7.—Approving location C.N. Ontario Ry. station grounds at mileage 69.83, Forestes Falls, Ross tp.

17684. Oct. 8.—Extending to Nov. 15 time within which G.T. Pacific Branch Lines Co. shall complete spur from Melville-Yorkton branch at Yorkton, Sask.

17685. Oct. 8.—Authorizing G.T. Pacific Branch Lines Co. to build Brandon branch across two highways, mileage 18.48 and 14.2, Brandon district, Man.

17686. Oct. 9.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build bridge 150.37 between lots 16 and 17, con. 1 Darlington tp., Ont.

17687. Oct. 9.—Approving C. N. Ontario Ry. location through Saltfleet tp., mileage 45.17 to 54.21.

17688. Oct. 5.—Ordering G.T.R. to protect West and Front streets, Orillia, Ont., by gates and watchmen.

17689. Oct. 10.—Authorizing C.P.R. to build spur for Consolidated Rubber Co., Winnipeg.

17690. Oct. 10.—Extending, to Dec. 31, time within which C.P.R. shall complete branch for British Columbia Brass, Ltd., New Westminster.

17691. Oct. 10.—Extending, to June 20, 1913, time within which C.P.R. shall complete apnr for Provincial Reformatory, Guelph, Ont., as authorized by order 17075, July 19.

17692. Oct. 10.—Approving C.P.R. location northeasterly from Bergen to lot 58, Kildonan parish, Man., 9.92 miles.

17693. Oct. 10.—Authorizing G.T.R. to build siding for Pratt & Letchworth Co., in Brantford, Ont.

17694. Oct. 10.—Amending order 15654, Dec. 16, 1911, to provide for interchange track, at Petrolea, Ont., between M.C.R. and G.T.R., within 15 days after conveyance of land for the purpose.

17695. Oct. 10.—Authorizing Montreal and Atlantic Ry. (C.P.R.), to build spur across Academy street, Sutton, Que.

17696. Oct. 9.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.), to cross G.T.R. overhead, near Shannonville station, Ont., mileage 69.25 from Glen Tay, without lowering G.T.R. tracks.

17697. Oct. 10.—Ordering G.T.R. to protect Ottawa street, Hamilton, Ont., by watchman, between 7 a.m. and 7 p.m., in addition to bell already installed.

17698. Oct. 10.—Authorizing Canadian Northern Ry. to build spur, from mileage 0 to 0.80, on main line, to connect with transfer yard west of Dawson road, St. Boniface, Man.

17699. Oct. 9.—Ordering C.P.R. to make grade on south side of track at crossing on lot 18, con. 7, Peel tp., mileage 27.07, ¼ mile west of Wallenstein station, 1 in 20; to be completed by Oct. 31.

17700. Oct. 9.—Authorizing G.T.R. to build additional track across Richmond street, Strathroy, Ont.

17701. Oct. 8.—Authorizing G.T.R. to build siding for proposed hospital for insane, at Whitby, Ont.

17702. Sept. 26.—Authorizing C.P.R. to cross highway overhead between cons. 4 and 5, Ops tp., Ont.

17703. Oct. 9.—Authorizing Toronto Suburban Ry. to cross under C.P.R. on lot 12, con. 3, Toronto tp., Ont.

17704. Oct. 9.—Authorizing Louth tp., Ont., to build highway across G.T.R., between lots 22 and 23.

17705. Oct. 9.—Ordering G.T.R., to cut down trees and reduce clay banks obstructing view of highway crossing one mile north of Burks Falls, Ont.

17706. Oct. 12.—Authorizing G.T. Pacific Ry. to carry traffic over its Regina-Boundary branch, between Colfax, mileage 47.9, and Talmage, mileage 66.5, Sask.

17707. Oct. 11.—Authorizing G.T.R. to rebuild bridge carrying Victoria avenue across its tracks, Niagara Falls, Ont.

17708. Oct. 8.—Authorizing diversion of highway immediately west of G.T.R. station at Thornton, Ont.

17709. Oct. 9.—Approving location and detail plans of new G.T.R. station at Sunnyside, Toronto.

17710. Oct. 8.—Ordering G.T.R. to reduce, to 4 ft., height of cedar hedge, and right of way fence, along n.e. side of highway near Thornton station, Ont.

17711. Oct. 11.—Authorizing G.T.R. to rebuild bridge 75, mileage 8.21, over Grand river, Brantford, Ont.

17712. Oct. 4.—Amending order 17230, Aug. 14, re operation of Mount McKay and Kakabeka Falls Ry. over C.P.R., at Neebing avenue, Fort William, Ont., by removing restriction as to using steam as motive power.

17713. Oct. 11.—Authorizing C.P.R. to build spur for Ontario Rock Co., Belmont tp., Ont.

17714. Oct. 11.—Authorizing C.P.R. to build two spurs for Purmal Brick Co., Medicine Hat, Alta.

17715. Oct. 10.—Approving C.P.R. plan, June 21, showing changes to be made in electric bell protection at Main street, Carleton Place, Ont.

17716. Oct. 11.—Authorizing C.P.R. to build spur for Moffat Stove Co., Weston, Ont.

17717 to 17720. Oct. 10, 11.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.), to build bridge at mileage 30.9, Hinchinbrooke tp., overhead crossing, at mileage 130.78, Port Hope tp.; bridge 133.90, Hope tp., and bridge at mileage 41.45, Camden tp., Ont.

17721. Oct. 10.—Relieving C.N. Ontario Ry. from providing further protection at highway crossing just south of Brechin.

17722. Oct. 4.—Amending order 17231, Aug. 14, re operation of Mount McKay and Kakabeka Falls Ry. over G.T. Pacific Ry. at Neebing avenue, Fort William, Ont., by removing restriction as to using steam as motive power.

17723. Oct. 8.—Authorizing Toronto Suburban Ry. to cross under G.T.R. on lot 19, con. 8, Esquesing tp., Ont.

17724. Oct. 10.—Approving Toronto Eastern Ry. revised location, on Bond street, Oshawa, Ont.

17725, 17726. Oct. 11.—Authorizing Walkerville Water Co. to lay water pipe under Essex Terminal Ry. at Argyle road, and Lake Erie and Detroit River Ry. (Pere Marquette Rd.), at Edna street, Walkerville, Ont.

17727. Oct. 9.—Approving Niagara, St. Catharines and Toronto Ry. location, through Louth and Clinton tps., Ont., mileage 0 to 10.59.

17728. Oct. 12.—Authorizing G.T. Pacific Ry. to carry traffic over its Alberta coal branch from mileage 0 to 36.6.

17729. Oct. 11.—Authorizing C.P.R. to build spur to Alberta Foundry and Machine Co., Medicine Hat, Alta.

17730. Oct. 12.—Approving revision in line and grade of portion of C.P.R. Sudbury-Sault Ste. Marie branch, from mileage 7.42 to 8.39 (Webbwood section), Waters tp., Ont.

17731, 17732. Oct. 9.—Authorizing city of Hamilton, Ont., to extend Birmingham street across Toronto, Hamilton and Buffalo Ry., and G.T.R., in lot 7, con. 1, Barton tp., now portion of the city.

17733. Oct. 12.—Temporarily approving G. T.R. freight mileage tariff, C.R.C. 11, between and including Prince Rupert and South Hazelton, B.C.

17734. Oct. 12.—Authorizing G.T. Pacific Branch Lines Co., to build additional spurs from its Alberta coal branch for Macleod Collieries.

17735. Oct. 11.—Authorizing C.P.R. to build spur for York Shaw, Calgary, Alta.

17736. Oct. 12.—Extending to Nov. 30, time within which C.P.R. shall build spur for M. Rumely Co., Saskatoon, Sask.

17737. Oct. 11.—Approving proposed location of C.P.R. station at Innerkip, Ont.

17738. Oct. 8.—Authorizing C.N. Ontario Ry. to take portion of lot 15, con. 4, Nepean tp., for carrying out diversion, as approved by order 13701.

17739. Oct. 4.—Authorizing C.N. Ontario Ry. to build across Bridge street, Yarker.

17740. Oct. 11.—Amending order 17281, Aug. 13, re C.P.R. spur east of Nesbing avenue, Fort William, Ont.

17741. Oct. 11.—Authorizing C.P.R. to build spur for J. T. Hepburn Co., Toronto.

17742. Oct. 14.—Approving proposed location of C.P.R. station at Husaar, Alta.

17743, 17744. Oct. 14.—Authorizing C.P.R. to construct spurs for Tregillus Clay Products Co., Shaganappi, Alta., and Bishopric Wallboard Co., Junction Gore, Ottawa, Ont.

17745, 17746. Oct. 14.—Extending, for six months, time within which Esquimalt and Nanaimo Ry. shall file standard tariff of maximum freight tolls for approval, and authorizing it to build spur for Shawinigan Lake Lumber Co., Victoria, B.C.

17747. Oct. 14.—Authorizing C.N. Ontario Ry. to build across and divert public road, lot 4, Bristol tp., Que.

17748. Oct. 14.—Approving Canadian Northern Ry. plans standard no. 6 station, for its eastern lines.

17749. Oct. 15.—Approving location of C. N. Ontario Ry. station grounds at Bristol corners, Que.

17750. Oct. 14.—Approving by-law authorizing W. McNeill to prepare and issue Western Canada Power Co. tariffs of tolls.

17751, 17752. Oct. 16.—Authorizing G.T.R. to rebuild bridge 15, to mileage 22.73, across Welland canal, near St. Catharines, and bridge 45, mileage 76.83, over Huron road, between North and South Easthope tps., Ont.

17753. Oct. 11.—Ordering G.T.R. to maintain electric bell at crossing just east of Jordan station, Ont.

17754. Oct. 15.—Extending to June 15, 1913, time within which Dominion Atlantic Ry. should complete bridge across Shubenacadie river at South Maitland, N.S.

17755. Oct. 16.—Authorizing C.P.R. to build branch across road allowance at south end of sec. 30, tp. 16, r. 5, w. 2 m., Sask.

17756. Oct. 16.—Relieving G.T.R. from providing further protection at crossing on Trolley street, Hamilton, Ont.

17757. Oct. 14.—Approving C.N. Quebec Ry. location through Arundel, Ponsonby and Amherst tps., mileage 0 to 12.41.

17758. Oct. 14.—Authorizing G.T. Pacific Branch Lines Co. to build its Brandon branch across highway between secs. 17 and 18, tp. 10, r. 18, w.p.m., Man.

17759. Oct. 14.—Authorizing C.N. Ontario Ry. to build across Laughton avenue overhead, in Toronto.

17760. Oct. 14.—Authorizing Canadian Northern Ry. to build its Morris to Portage branch across 25 highways in Manitoba.

17761. Oct. 17.—Authorizing C.P.R. to build spurs for city of Medicine Hat, Alta., and for Medicine Hat Pottery Co.

17762. Oct. 14.—Ordering Hamilton Radial Ry. to build farm crossings for J. B. Leonard and W. J. Copp, Nelson tp., Ont.

17763. Oct. 16.—Authorizing Lachine, Jacques Cartier and Maisonneuve Ry. (G.T.R.) to build bridges across Ontario, Forsyth, Hochelaga, Sherbrooke, Bercy, Hogan and Masson streets, Cote de la Visitation, Iberville; De Fleuriment street, Cote St. Michel road, Bagg Ave., Sault au Recollet road, St. Denis and St. Lawrence boulevards, Montreal.

17764. Oct. 16. — Anthorizing Canadian Northern Ry. to build across 15 highways on its Calgary southerly branch.

17765. Oct. 16.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build across forced road overhead, in lot 15, con. 7, Camden tp., mileage 48.7 from Glen Tay, Ont.

17766, 17767. Oct. 16.—Authorizing C.P.R.

to build spurs for Great Western Lumber Co., Red Deer, Alta., and Dodge Manufacturing Co., West Toronto, Ont.

17768. Oct. 16.—Authorizing C.P.R. to open for traffic its second main line between Adirondack Jct. and St. Constant, Que., about 4.70 miles.

17769. Oct. 14.—Authorizing G.T. Pacific Ry. to carry traffic over its line in British Columbia, between mileage 164 and 176.8, east of Prince Rupert.

17770. Oct. 16.—Authorizing G.T. Pacific Ry. to build spur for city of Edmonton yards, Alta.

17771. Oct. 16.—Certifying corrections in location plan of G.T. Pacific Branch Lines Co., Tofield-Calgary branch, from sec. 21, tp. 29, r. 24, w. 4 m., to sec. 1, tp. 23, r. 1, w. 5 m., Alta., mileage 150 to 198, as approved by order 10662.

17772. Oct. 16.—Authorizing G.T.R. to build siding for Massey-Harris Co., Toronto.

17773. Oct. 14.—Authorizing Esquimalt and Nanaimo Ry. to build spur for D. McKenzie, Victoria, B.C.

17774. Oct. 15.—Authorizing Barton tp., and Hamilton City and Suburban Homes, Ltd., to build Rosedale avenue, at grade, across T.H. & B. Ry.

17775. Oct. 17.—Authorizing C.P.R. to build bridges 24.2 and 24.1, over Otonabee river, Toronto subdivision.

17776. Oct. 16.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build bridge at mileage 130.21 across road allowance between lots 18 and 19, con. 2, Hope tp., Ont.

17777. Oct. 16.—Authorizing C.N. Alberta Ry. to build under G.T.P.R., in n.e. ¼ sec. 15, tp. 46, r. 1, w. 6 m.

17778. Oct. 17.—Authorizing Canadian Northern Ry. to build its Prince Albert-Battleford line across four highways in Saskatchewan.

17779. Oct. 17.—Authorizing C.N. Quebec Ry. to build across public road in St. Eustache.

17780. Oct. 17.—Authorizing G.T. Pacific Ry. to carry traffic on its Moose Jaw branch between Regina and Moose Jaw, mileage 0 to 34.7.

17781. Oct. 16.—Extending time for G.T.R. to restore proportion, viz., 88c. a ton, of joint rate of $1.60 a ton, on pressed brick from Bradford, Pa., to Windsor, Ont., as required by order 17552. Sept. 21.

17782, 17783. Oct. 17.—Authorizing C.N. Ontario Ry. to build across public road between cons. 3 and 4, March tp., and overhead across St. Lawrence Boulevard and St. Denis Boulevard, Montreal.

17784. Oct. 17.—Authorizing Nelson and Fort Sheppard Ry. (G.N.R.) to take up spur at Tamarack station, B.C.

17785. Oct. 17.—Extending to July 1, 1913, time within which C.P.R. shall complete branch for Crushed Stone and Gravel, Ltd., authorized by order 16981.

Traffic Orders by the Board of Railway Commissioners.

The dates given for orders are those on which the hearings took place, and not those on which the orders were issued:—

C.P.R. STANDARD FREIGHT MILEAGE TARIFF.

17270. Aug. 23. Re application of C.P.R. Co. for approval of a standard freight mileage tariff to be designated as C.R.C. no. W. 1758 to comply with sec. 327 of the Railway Act. It is ordered that the said tariff between the company's stations in Alberta and British Columbia, between Canmore, Alta., and Vancouver, B.C., including its Arrow Lake, Mission and Westminster branches, be temporarily approved pending judgment in the inquiry by the Board into the rates charged generally in British Columbia; provided that in the meantime no increases shall be made in the rates of any special freight tariff of class rates within the territorial limits of the said standard freight mileage tariff, and that no rates shall be increased because of this order.

BRICK RATES, BRADFORD, PA., TO WINDSOR, ONT.

17552. Sept. 21. Re application of Cadwell Sand and Gravel Co., Ltd., of Windsor, Ont., complaining of increased rate on pressed brick from Bradford, Pennsylvania, to Windsor, Ontario, from $1.60 to $2 a ton. Upon hearing the application at Toronto, on April 30, the applicants and the Canadian Freight Association being represented; and upon its appearing that the G.T.R. will receive an additional 32c. per ton as its proportion of the increased rate to $2 a ton—it is ordered that the proportion, viz., 88c. per ton, which accrued to the G.T.R. as its percentage division of the joint rate of $1.60 a ton charged from Bradford, Pa., to Windsor, Ont., prior to April 20, be restored by the G.T.R., within 45 days from the date of this order, as a proportional rate from Buffalo to Windsor, and as the maximum proportional to intermediate G.T.R. points, limited to brick shipped from Bradford and Bradford rate points destined to Windsor and the said intermediate points.

Order 17781. Oct. 16.—Postponed the effective date of the above order 17552.

CRUSHED STONE FREIGHT RATES.

17493. Sept. 16.—Re application of Power City Stone Co., Ltd., of Niagara Falls, Ont., complaining of change proposed by Michigan Central Rd. in rate of crushed stone from the applicants' quarry, Niagara Falls, to Toronto, under supplement 10 to its Joint Commodity Tariff C.R.C. 1743; and applying for an order disallowing or suspending said tariff: It is ordered that the said proposed supplement shall not come into force, pending a hearing and disposition of the application by the Board.

LUMBER RATES FROM PORT ARTHUR, ONT.

17619. Sept. 25.—Re application of Vigars-Sheer Lumber Co., Ltd., of Port Arthur, Ont., complaining that it is unjustly discriminated against in the matter of carload traffic to or from Grand Trunk Pacific Ry. points which is interswitched by the Canadian Pacific and Canadian Northern Railways between Westfort and Port Arthur, Ont.: It is ordered that the joint freight rates to be charged by the C.P.R., the Canadian Northern Ry. and the G.T. Pacific Ry. on lumber, in carloads, between Port Arthur and Fort William and points on the G.T.P.R. Lake Superior branch be not higher than 1 cent per 100 lbs. over and above the G.T.P.R. rates between Westfort and Lake Superior branch points: the tariff, or tariffs, to comply with this order, to become effective not later than 21 days from the date hereof.

Transportation Conventions in 1912.

Nov. 6-10.—Association of Railway Electrical Engineers, Chicago, Ill.

Nov. 15.—American Railway Association, Chicago, Ill.

Nov. 15-16.—American Association of Freight Traffic Officers, Chicago, Ill.

Nov. 19-21.—Maintenance of Way Master Painters' Association, Chicago, Ill.

Dec. 12-13.—Association of Transportation and Car Accounting Officers, Louisville, Ky.

Among the Express Companies.

The Canadian Northern Ex. Co. has opened waybill offices at Ardath and Avonlea, Sask.

The Canadian Northern Ex. Co. has opened offices at Morrin, Alta.; Berton, Man., and Forward, Sask.

L. C. Goodge has been appointed agent, Dominion Ex. Co., Yarmouth, N.S., vice A. Steves, deceased.

C. A. Roach, heretofore stationed at Cornwall, Ont., has been appointed route agent, Canadian Ex. Co., with headquarters at Montreal.

A Steves, agent, Dominion Express Co., Yarmouth, N.S., was killed at Hartford, near Yarmouth, Oct. 16, when his automobile turned over. He was accompanied by W. F. Branscombe, route agent, Dominion Ex. Co., St. John, N.B., who escaped injury.

N. J. Ross, Superintendent, Canadian Ex. Co., was in Prince Rupert, B.C., during October, for the purpose of looking over the ground with a view to the inauguration of the company's express system from that city to interior points along the G.T. Pacific Ry.

The Board of Railway Commissioners has ordered that the express delivery and collection limits in Summerside, P.E.I., be those enclosed by Water street, from Clarks brook to East street, East, Ottawa, Granville, Green and Centre streets, Hawthorne avenue, Duke, North Market and Northumberland streets, to the water front; of Fredericton, N.B., enclosed by River street, John street, between Lansdowne street and Odell avenue, Waterloo row, from south end of Ketchums bridge, Lansdowne street, University avenue, C.P.R. to station, Victoria street, from Carleton street, Smythe and Saunders streets, and Odell avenue to the river; and of Rouleau, Sask., enclosed by Wetmore street, from Railway avenue, Knox avenue, Brownlee street and Railway avenue to starting point.

The Canadian Ex. Co. has had built five electric trucks for city service in Montreal to take the place of horse drawn wagons. Three of them are of two tons capacity each, the others of one ton each. They have a speed of from 10 to 12 miles an hour, which is more than double the efficiency of the old horse wagon, and will travel for 45 miles on a single charge. The large vehicles are 166 ins. long overall and 76 ins. wide. The others are 149 ins. long and 72 ins. wide. Horses often require the attention of more than one driver. They can only cover a limited amount of ground in a day. Their care and feeding is costly. Large stables must be maintained in convenient proximity to the railway station, where real estate values are often at their highest. In the search for improved methods the Canadian Ex. Co. was led to a choice between gas and electricity as the motive power. Inquiry from similar concerns in the United States, where both had been tried, and careful investigation decided the latter as the better field for experiment on account of its perfect simplicity of mechanical parts, which means fewer repairs and less attention; of its perfect ease of control, which allows any intelligent horse driver to run an electric; of the absence of fire risk; and of economy from the fact that power is not consumed when the vehicle is not in operation. The introduction of these cars is largely in the nature of an experiment, but if the results that are hoped for can be obtained it is probable that the horse will be largely, though gradually, superseded. Climatic conditions are more favorable to the south, but while it is a little doubtful if the electrics can be operated in Montreal the year round there is no reason why this should not be done in Toronto. Owing to the batteries, which are suspended from the floor of the trucks, these can only pass over well beaten roads where snow drifts have to be encountered, but even in Montreal it should be possible to use them during more than seven months out of the twelve. Charging the motors is a somewhat lengthy operation, but this can be done at night so that no time is lost. The Canadian Ex. Co. is installing its own charging plant at the stables in Montreal, which must now serve as a garage.

Attention is called, by the Winnipeg Free Press, to the fact that on Oct. 9, 1877, the steamboat Selkirk arrived in Winnipeg with the first locomotive to reach the Canadian prairies.

Electric Railway Department.

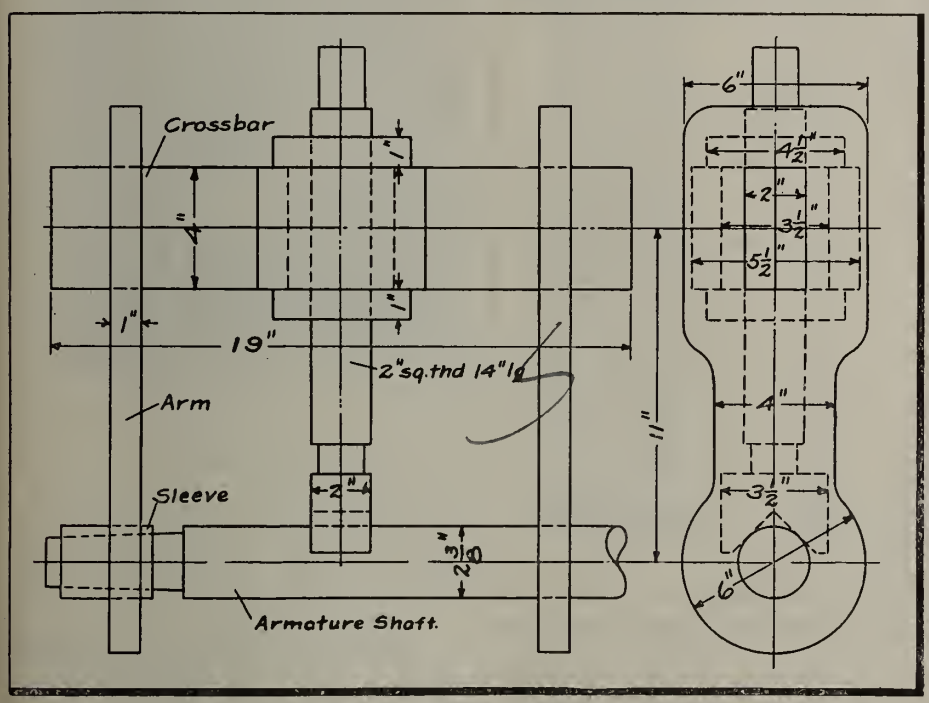
Straightening Motor Axles at London Street Railway Shops.

A convenient means of straightening motor axles that have accidentally become bent, without the necessity of removal from the lathe when placed therein for turning, is in use in the London (Ont.) St. Ry. shops, R. H. Welburn, Master Mechanic. It often occurs that the axle may have become slightly bent in service, maybe to a degree that would not be noticed until placed in the lathe. To remove from the lathe and straighten, under any of the usual methods, and then insert in the lathe to determine if sufficient bend has been given to the shaft, is at the best a slow task, and one that is fatiguing to the operator.

In the method used in the London shops, the bending attachment can be applied directly to the axle as mounted between the lathe centres for turning. Two arms, bored 2⅜ ins. diameter at the lower end, the diameter of the standard axle in use on that system, are slipped on to the axle, the latter passing through these holes. Centering 11 ins. out on these arms, there is a 2 x 4 in. opening for the reception of a crossbar of the same dimensions. This crossbar is built up from two 1 in. slabs, rivetted together. These slab pieces encircle at the centre a square threaded nut, through which passes a square threaded screw, 2 ins. in diameter and 14 ins. long. This bears down at the lower end on a V block resting on the bent part of the shaft.

When the bend occurs at a point where the outer arm must be near the end of the shaft, there is a taper collar of the same outside diameter as that of the shaft, to fit over the taper pinion end. The bending attachment can thus be moved to any position, with the arms close together, or at the maximum distance apart, as the nature of the bend requires.

A set can be given to the shaft, and the shaft tested for correctness by loosening up the screw and allowing the attachment to hang down on the side of the lathe while the axle is revolved on the centres, and the eccentricity, if any, determined preparatory to another application of the press.



Press Attachment for Straightening Motor Axles Directly in the Lathe.

Disposition of Lost Articles by Toronto Railway Company.

The Ontario Railway and Municipal Board gave the following judgment Sep. 28:—

This is an application made by the city to the Board to prescribe the method of dealing with articles, which may be left upon the company's cars by the travelling public. The company, some years ago, when articles were left on the cars, adopted the practice of sending them to its head office at the corner of King and Church streets. The number of articles which the company were called upon to take care of became so large, and so much time was taken up by claimants making enquiries at the office, identifying their property, and resuming possession of it, that the conductors returning their fare boxes were very much inconvenienced and delayed. The service was so affected that the company found it expedient some time ago to direct each conductor to take the articles in the first place to the car barns at the end of his run, where they were left along with a memorandum giving particulars of where they were found. They were then gathered together and sent by car to the barn on Lansdowne avenue. The company there provided a room for storing them and a clerk to examine, label and put them in racks, so that they could be identified and returned to the owners when they applied for them. A telephone is maintained for the convenience of persons making enquiries. The city says that this practice, in dealing with lost articles, is unjust, unreasonable and improper, and without suggesting any other method in their application, ask that this Board should prescribe the way in which these articles should be dealt with by the company. It was suggested at the hearing, by the city, that the company should provide a building in the down town district, in the neighborhood of the loop on Scott street and fit it up for the reception of lost articles and provide the clerical or other assistance necessary to handle them. It appears in the evidence that in the last year over 13,000 lost articles have been taken care of by the company. Of these about 7,000 were claimed and restored to the owners.

The franchise agreement between the city and the company makes no provision for the care and disposal of lost articles. The only provision in reference to property left on the cars, is contained in sec. 215 of the Ontario Railway Act, of 1906. This section provides that "It shall be the duty of every street railway company, which shall have unclaimed property left in its cars, to ascertain, if possible, the owner or owners of such property, and to notify such owner or owners of the fact by mail as soon as possible after such property comes into their possession. Every such company which shall have such property, not perishable, in its possession for a period of three months, may sell the same at public auction, after giving notice to that effect, by one publication, at least 10 days prior to the sale, in a daily newspaper published in the city or town in which such sale is to take place, of the time and place at which such sale will be held, and such sale may be adjourned from time to time until all articles offered for sale are sold. All perishable property so left may be sold by any such street railway company without notice, as soon as it can be, upon the best terms that can be obtained."

It will be observed that the duty of the company under this section, is to ascertain, if possible, the owner or owners and notify them by mail. It would scarcely be possible to notify the owners, unless the lost articles had upon them an address or some means for the identification of the owner. The city relies on the Ontario Railway and Municipal Board Amendment Act, 1910, 10 Edw. VII., cap. 83, sec. 7, which provides that the act shall be read with and as part of the Ontario Railway and Municipal Board Act, 1906, and secs. 2, 3, 5 and 6 of the act shall apply to street railways as well as other railways. It will be observed that the act. 10 Edw. VII., cap. 83, is an amendment to the Ontario Railway and Municipal Board Act of 1906, not to the Ontario Railway Act of 1906. That act, 10 Edw. VII., empowers the Board to determine the just, reasonable, safe, proper and adequate regulations, practices, equipment, appliances or service to be observed and to be used in the transportation of passengers, freight and property. It does not extend to the care of property left on the cars. It only applies to transportation. The Board is of opinion that it has no power or jurisdiction under the Ontario Railway and Municipal Board Amendment Act of 1910 to declare that the practice adopted by the company in the care of articles left on the cars is unjust, unreasonable and improper, and to prescribe some other method of caring for them and restoring them to the owners. The application is dismissed, but without costs, except that the city shall pay $20 for stamps on the formal order.

Halifax Electric Tramway Co.

For some time past it has been reported that a change in the control of the company was impending, and on Oct. 8 it was semi-officially announced in Halifax that the control of the company had passed into the hands of a syndicate of Montreal financiers headed by E. A. Robert, President Montreal Tramways Co. The report further stated that the new interests will develop a water power close to Halifax, and that the H.E.T. Co. will be the principal user of the power generated. It is said that there is no intention to transfer the offices from Halifax to Montreal.

The Nova Scotia Legislature at its last session passed an act respecting the exclusive franchise granted the Halifax Electric Tramway Co. and the city of Halifax. The reasons for passing the act are set out in the preamble from which it appears that the existing franchise will expire in 1916; and that negotiations had taken place between a majority of the directors and the city council as to terms, which negotiations had not been submitted for the shareholders' approval. It was considered desirable to postpone approval of such negotiations to maintain the existing contract or franchise, and to provide that no disposition shall be made of the company's undertakings while the present act is in force.

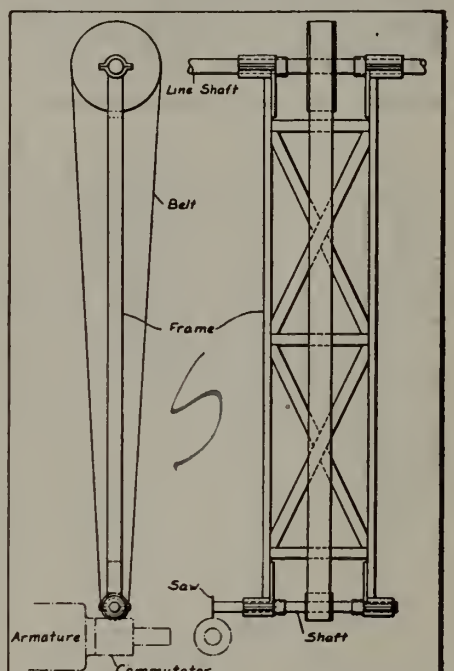
The act provides that the exclusive franchise granted the company by the statutes of 1895 be extended 21 years on the same terms so far as taxes and contributions to the city are concerned. The charges for fares, electric current and gas are made subject to the Public Utilities Board; and the net profits of the company are to be divided as follows:—A dividend to stockholders not to exceed 8%; a fund for the extension and improvement of the property to be created by the setting aside of an amount up to a 4% dividend on the common stock, and any balance to be equally divided between the company and the city. These sections of the act are to become operative on a date to be fixed by proclamation. The act also provides that the directors are to report at the next annual meeting of shareholders the progress of negotiations with the city council for the purpose of securing an expression of their views upon the same.

There is to be no increase in the amount of bonds or debentures issued beyond the present amount of $600,000 of 5% first mortgage bonds, and no second mortgage or other charge is to be placed upon the property, except such as may be given to secure the existing bond issue or any renewal of the same. The capital stock is not to be increased beyond the present amount of $1,500,000, and no stock is to be granted preferential rights. The company is not to dispose of its property in whole or in part, and it is not to enter into agreements or contracts with other companies for the purchase of hydro-electric power, or any water power, for the purposes of the company. The company's power to pay dividends is limited to 8%; all outstanding proxies are declared to be void, and any company having similar objects to the H.E.T. Co., holding any of its shares is declared to be incapable of voting either in person or by proxy, at any of the company's meetings. This part came into force May 3, the date of the passing of the act, and is to remain in force until May 3, 1913, unless sooner repealed.

At a meeting of the laws and privileges committee of the Halifax, N.S., city council, Oct. 7, a resolution was adopted that the city solicitor be instructed to propose legislation which would serve to prevent a possible removal of the Halifax Electric Tramway Co.'s head office to Montreal. It was stated that it had been ascertained that the control of the company had shifted from Halifax to Montreal, and it was feared that the head office would follow, which would make it inconvenient for the inspection of the books by the authorities. The city receives 4% of the gross receipts of the street railway, and 2% of the gross receipts of the power plant.

Commutator Slotting Rig at Levis County Railway Shops.

The Levis County Ry. shops at Levis, Que., are small, as the number of cars operated is so few that the capacity for repair need not be very large. In common with other small shops similarly situated, the equipment is not very large, calling for the exercise of a good deal of native ingenuity in the repair of the rolling stock, and the maintaining of it in good condition under the heavy conditions of operation to which



Rig for Slotting Commutators to Remove Mica Fins.

cars in a hilly town like Levis are subjected.

From this latter cause, burnt out motors are of more or less frequent occurrence, although this difficulty has of late been materially minimized by the use on all cars of a regulator to prevent an overcharge of current to the motor when starting under heavy load as on a hill. The method of putting such motors again in condition by rewinding was described in a previous issue.

The wearing down of the commutator on a motor is a condition with which all roads have to contend. Not only is the wear uneven at different points on the circumference, but the greatest trouble arises from the fact that the copper segments wear down more rapidly than the separating layers of mica, leaving the outer edges of the latter projecting out beyond the metal. A simple rig, which is shown in the accompanying illustration, has been built up in these shops to remove these projecting fins.

A wooden framework is supported from bearings on the shop line shaft, the bearings allowing the frame to hang freely on the revolving shaft, and also permit of swing of the lower end. On this lower end there is a small shaft, carrying at one end a thin saw cutter. A large pulley on the line shaft drives the small shaft at a high speed through a belt on the frame passing over a small pulley of the small shaft.

The armature, with the commutator ring to be slotted, is mounted horizontally in V grooves between two horses, directly under the path of the saw, and at the requisite height to cause the cutter to form a shallow slot in the mica insulation between the commutator segments. The operator holds the commutator in position on the horses with one hand, and with the other swings the cutter frame along the length of the slot, repeating this operation for all the slots. The arc through which the frame swings is so small that the resulting groove is to all purposes level, and for the purpose required is amply accurate.

The whole time required to mount and slot a complete commutator is only about 10 minutes. This is accomplished on a machine that complete only cost in the neighborhood of $12 to build. There are other uses to which the machine is put to advantage, principal among them being that of sawing up wood and similar operations.

Regina Municipal Railway Construction, Equipment, Operation, Etc.

This railway, which commenced operation July 29, 1911, built during that year 10½ miles of single track and operated six single truck cars, the approximate expenditure being $500,000. During the present year a further three miles have been constructed, and 14 cars have been added, the additional approximate expenditure being $250,000. The construction which has been sanctioned for 1913 consists of 18 miles of single track, and the purchase of 12 double truck cars, six single truck cars, one additional snow plough, 12 gravel dump cars, 18 garbage cars, four construction flat cars, and one construction motor car, at an approximate expenditure, including cost of pavement between tracks, of $700,000. It is proposed to call for tenders for all the material required for the 1913 work, during January, to enable track construction to be commenced as soon as the frost is out of the ground.

The following orders have recently been placed,—Eight 28 ft. car bodies with pay-as-you-enter rear vestibules, at a cost of $31,272, with the Preston Car and Coach Co.; four quadruple 101B motor equipments and eight sets straight air brake equipment, at a cost of $11,856, with the Canadian Westinghouse Co., four quadruple G E. 80A motor equipments, at a cost of $9.400, with the Canadian General Electric Co., and eight sets 27G1 trucks, all steel rolled wheels, at a cost of $7,360. Each car delivered f.o.b. Regina, will cost $7,481.

Following is the general specification of the cars:—

Length of car body	28 ft.
Length of front vestibule	5 ft.
Length of rear vestibule	7 ft.
Length of car over buffers	41 ft.
Width of car	8½ ft.
Truck wheels, diar.	33 ins.
Width of tread	2½ ins.
Width of flange	⅞ in
Depth of flange	⅞ in.
Axles, diar.	4½ ins.
Gauge	4 ft. 8½ ins.

The passenger returns to Aug. 31, show number of passengers carried, 1,760,969; revenue received, $81.955.45. The average weekly operation shows, 53,000 passengers carried, and a revenue of $2,300. There is an average of 12 cars now in operation, and by the end of the year it is anticipated that 20 cars will be running. The railway is showing a satisfactory net profit above operation charges, and all fixed charges against capital expenditure. H. Doughty is Superintendent.

Canadian Street Railway Association's Annual Meeting.

The annual meeting of this Association was held at London, Ont., Oct. 4 and 5, there being a good attendance of representatives of member companies from the various provinces. The President, James Anderson, General Manager Sandwich, Windsor & Amherstburg Ry. occupied the chair.

The Secretary-Treasurer, Acton Burrows, presented a very complete report dealing in detail with the Association's work during the year, referring to Dominion and Provincial legislation affecting electric railways, the actions of the Boards of Railway Commissioners and the various provincial utility commissions, operating rules for electric railways, and a number of other important topics, including information on a variety of subjects which had been gathered at the request of certain member companies and distributed to the entire membership. The report was discussed section by section and action was taken on a number of the subjects brought up.

P232 Patrick Dubee,
President, Canadian Street Railway Association.

Papers were read on several subjects, including telephone train dispatching, automatic railway dispatching and signalling, the evolution of the electric railway car, track construction, the use of T rails, etc., etc. There were also a number of topical discussions on other subjects of vital interest to electric railway interests and which had been suggested by officials of member companies.

The election of officers resulted unanimously as follows:—President, Patrick Dubee, Secretary-Treasurer, Montreal Tramways Co.; Vice President, C. B. King, Manager London St. Ry.; Secretary-Treasurer, Acton Burrows, Managing Director, Canadian Railway and Marine World.

Executive Committee: — Jas. Anderson, General Manager, Sandwich, Windsor & Amherstburg Ry.; E. P. Coleman, General Manager, Dominion Power and Transmission Co.; J. D. Fraser, Secretary-Treasurer, Ottawa Electric Ry.; H. M. Hopper, General Manager and Purchasing Agent, St. John Ry.; J. E. Hutcheson, General Manager Montreal Tramway Co.; Wilson Phillips, Superintendent Winnipeg Electric Ry.

Assistant Secretary, Aubrey Acton Burrows, Secretary and Business Manager, Canadian Railway and Marine World.

The officers attending the meeting were most hospitably entertained by C. B. King, Manager London St. Ry., who gave a dinner and also a theatre party for them. After the conclusion of the business on Oct. 5, the party were taken by special car over the London & Lake Erie Ry. and Transportation Co.'s line from London to Port Stanley, on the invitation of the General Manager, S. W. Mower, and were given every opportunity of thoroughly inspecting that up to date interurban line, one of the most interesting features of which is the operation of four car trains during the busy summer.

Inquiry Into Montreal Tramway Company's Service.

The Quebec Public Utilities Commission has decided to make an enquiry into the Montreal Tramway Co.'s service in Montreal and contiguous municipalities, to determine (a) whether the Commission's directions respecting the prevention of accidents and the lessening of danger from the operation of cars, as issued on Nov. 18, 1910, and amendments thereto are being complied with; (b) whether the Company is or is not providing such equipment and operation of its service as are required for the safety and convenience of the public and for the proper carrying out of any contract, charter or franchise granted to or controlled by it, whereby the use of public property or rights is involved; (c) should there appear to be defects and deficiencies in any of the matters involved in such equipment or operation, or the means of carrying out or exercising such contract and franchise, what may or should be done to remedy the same; and (d) to obtain full and complete information upon all matters directly or indirectly involved in the foregoing inquiry, and to deal therewith, so far as the Commission's jurisdiction may lie.

The Quebec Public Utilities Commission has directed the Montreal Tramways Co. to produce before it all information concerning the company and its subsidiary lines. The information called for includes everything relating to the operation of the lines during the past two years. The city of Montreal is also called upon to produce all information in its possession with respect to the company and its relations to the city.

Electric Railway Finance, Meetings, Etc.

British Columbia Electric Ry.—Gross earnings for Aug., $553,148; operating expenses, $343,979; net operating earnings, $209,169; renewal funds, $51,620; net earnings, $157,549; approximate income from investments, $35,000; net income, $192,549, against $436,520 gross earnings; $278,513 operating expenses; $158,007 net operating earnings; $37,935 renewal funds; $120,072 net earnings; $25,000 approximate income from investments; $145,072 net income for August, 1911. Aggregate gross earnings for two months ended Aug. 31, $1,091,988; net earnings, $381,842, against $845,850 aggregate gross earnings; $283,125 net earnings, for same period 1911.

Cape Breton Electric Co.—Gross earnings for Aug., $31,598.38; operating expenses and taxes, $16,100.77; net earnings, $15,497.61; interest charges, $4,495.83; balance, $11,001.78; sinking and improvement funds, $1,206.67; balance for reserves, etc., $9,795.11, against $28,933.97 gross earnings; $15,556.89 operating expenses and taxes; $14,277.08 net earnings; $4,512.50 interest charges; $9,764.58 balance; $1,140 sinking and improvement funds; $8,624.58 balance for reserves, etc., for Aug., 1911. Construction charges for Aug., $770.57.

Oshawa Ry.—The annual meeting was held at Deseronto, Ont., Sept. 30. Following are the officers and directors for the current year:—President, E. W. Rathbun, Deseronto; Manager, J. F. Chapman, Gananoque, Ont.; Secretary and Treasurer, H. W. Cooper, Gananoque; other directors, B. R. Hepburn, M.P., and D. A. Valleau.

Quebec Ry., Light and Power Co.—Gross earnings for August, $163,882; operating expenses, $79,479; net earnings, $84,402, against $150,652 gross earnings; $66,196 operating expenses; $84,455 net earnings for Aug., 1911.

Regina Municipal Ry.—Passenger earnings for Aug., $10,135.50; miscellaneous earnings, $472.50; total earnings, $10,608; operating expenses, $7,100.33; net operating earnings, $3,507.67; interest charges, etc., $2,544.87; net profit, $962.80. Passengers carried during month, 251,246. Car mileage, 38,565.

Toronto Ry., Toronto and York Radial Ry., Etc.—Gross earnings for Aug., $727,925; operating expenses, maintenance, etc., $325,519; net earnings, $402,406, against $654,730 gross earnings; $303,725 operating expenses, maintenance, etc.; $351,005 net earnings, for August, 1911. Aggregate gross earnings for eight months ended Aug. 31, $5,453,099; net earnings, $2,821,327, against $4,853,686 aggregate gross earnings; $2,490,150 net earnings, for same period 1911.

P305 C. B. King,
Vice President, Canadian Street Railway Association.

Winnipeg Electric Ry.—Gross earnings for Aug., $303,764; operating expenses, $162,431; net earnings, $141,333, against $299,615 gross earnings; $137,825 operating expenses; $161,790 net earnings, for Aug., 1911. Aggregate gross earnings for eight months ended Aug. 31, $2,427,830; net earnings, $1,133,895, against $2,503,972 aggregate gross earnings; $1,257,983 net earnings, for same period 1911.

A quarterly dividend at the rate of 12% per annum was paid Oct. 1 to shareholders of record at Sept. 20.

Royal Car on the British Columbia Electric Railway.

In connection with the recent visit of the Duke of Connaught to the Pacific coast the B.C. Electric Ry. was requested to arrange for the transportation of the royal party from Vancouver to New Westminster. In order to meet the demands fittingly, the company decided to specially equip one of its cars, and this work was handsomely done in its shops. The accompanying illustration shows the exterior and interior of the car which was one of the regular cars built for the company's Fraser river division. The interior fittings were entirely taken out and re-arrangement made in parlor car style throughout. The interior trimmings were of rich green and cream, the company's colors, relieved by light silk curtains at the windows, the carpeting being green and the chairs and lounges richly upholstered in green plush. The car was equipped with frosted lights, and as a portion of the run was in the evening, luminous electric radiators provided heating. The exterior of the car was painted in green and cream, the name, Connaught, and the royal coat of arms appearing on either side.

Royal Car on British Columbia Electric Ry.

Montreal Tramways Co.'s Freight Traffic.

The situation in regard to the carrying of freight through Montreal streets by the Montreal Tramways Co., has become rather interesting. For a considerable period, the company, then the Montreal St. Ry. Co., carried freight, but action was taken by the city to prevent this. A local decision was given against the company, which appealed to the Supreme Court. The latter body decided against the company early in October. The company immediately gave instructions that the decision be complied with, and the stoppage raised an outcry from contractors and others who have taken considerable advantage of the facilities offered by the company. The city council was approached by those concerned, and in turn the council appointed a special committee to interview the Tramways Co. management, with a view to returning to the former condition of affairs. The company, however, declined to do this unless the city council prepare and pass a bylaw giving the company the necessary permission. A bylaw is in course of preparation and will be dealt with as soon as possible, so that the facilities for the conveyance of contractors' and other materials across the city may be renewed.

Calgary Municipal Ry.—Passenger earnings for Sept., $59.136; miscellaneous earnings, $820.25; total earnings, $59.956.25; operating expenses, $36.688.34; net balance, $23.267.91; contingent account, interest and sinking fund, $10.211.29; net profit, $13.056.62, against $33.677.05 passenger earnings; $527.30 miscellaneous earnings; $34,204.35 total earnings; $20.135.55 operating expenses; $14,068.80 net balance, Sept., 1911.

Electric Railway Right of Way at Highway Crossings.

A point of considerable importance to electric railways was decided on Oct. 4, in a suit brought by S. Brundage against the Windsor, Essex & Lake Shore Rapid Ry. to recover $5,000 as damages for personal injuries, loss of two horses killed and damages to wagon and harness, which occurred on June 30, 1911, at a highway crossing on that company's line.

The company produced witnesses who testified that the highway crossing signal whistle had been sounded by the motorman on approaching the crossing, and it was contended that the plaintiff was asleep and in no condition to heed warning signals. The jury of 12 farmers gave a verdict in the company's favor, costs to be paid by plaintiff.

This decision is of great importance to all railway companies, as it apparently establishes the fact that if a car or train is operated in accordance with the regulations enacted by the Board of Railway Commissioners, railway companies are not liable to damages resulting from accidents at highway crossings.

Royal Car, British Columbia Electric Ry., Interior.

The Cape Breton Electric Co., operating the electric railways in Sydney, North Sydney, and to Glace Bay, has voluntarily increased its conductors' and motormen's wages, the new rates being, for the first year, 20c.; second year, 21c.; third year, 22c.; fourth year and up, 24c. an hour.

Electric Railway Notes.

The Edmonton Radial Ry., operated by the city of Edmonton, Alta., has ordered one Simplex, self clearing dump car from the Canadian Car and Foundry Co.

The Brandon, Man., city council has instructed the City Engineer to prepare specifications of single truck cars of the pay-as-you-enter type, with the necessary equipment.

The electric railway under construction in Saskatoon, Sask., is being provided with 12 single truck motor cars, built by the St. Louis Car Co., St. Louis, Mo. Each car will be 34 ft. 4 in. over bumpers, and 21 ft. 4 ins. over corner posts.

The Grand Valley Ry., which is in the hands of a receiver, proposes, press reports state, to put on a regular freight service between Brantford and Galt, Ont., and is having a special type of freight and express car built for the service. E. B. Stockdale, Brantford, Ont., is the receiver.

W. N. Warburton, heretofore in Toronto, Hamilton and Buffalo Ry. service at Hamilton, Ont., has been appointed General Manager, London and Lake Erie Ry. and Transportation Co., London, Ont., vice S. W. Mower, resigned. He was at one time with the Chatham, Wallaceburg and Lake Erie Ry.

The St. John Ry., St. John, N.B., has increased the rate of wages to its conductors and motormen by an advance of 2½c. an hour, the new schedule being, for the first six months, 18½c.; second six months, 20½c.; second year, 21½c.; third year and up, 23½c.; Sunday work, 4c. an hour extra.

The Board of Railway Commissioners has approved of standard passenger tariff at the rate of 4c. a mile; and of standard freight mileage tariff for the Western Canada Power Co.'s line. The tariffs are signed by R. F. Hayward, General Manager; W. McNeill, Assistant General Manager; H. Dalton, Passenger and Freight Agent.

During August, two employees were killed and nine were injured in the course of their work in connection with the operation of

electric railways in the Dominion. One of the fatalities was caused by the man falling from the running board of a car, and the other by being run over. Four of the other accidents were due to collisions, and one each to a fall, a derailment, to machinery and to a runaway.

The Toronto and York Radial Ry. has received two pay-as-you-enter cars, with steel underframes, 33½ ft. long, from the Preston Car and Coach Co.

The Toronto city council recently instructed the Commissioner of Works, to obtain the necessary equipment to enable the civic car line on Gerrard street east to be put into operation by about the end of November, and it has been decided to purchase at once three 45 ft. centre aisle cars, double end control, one work car and one sweeper.

The Regina, Sask., city council has ordered from the Preston Car and Coach Co. eight double truck car bodies, with accessories, delivered at Regina, for $31,272. The Canadian Westinghouse Co. secured a contract for four sets 101 B motors, at $2,340 each, f.o.b. Hamilton; eight sets air brake equipment at $312 each, f.o.b. Hamilton; and the Canadian General Electric Co., Toronto, was given a contract for four sets of 6—80 A motors at $2,350 each, f.o.b. Peterboro, Ont.

The following changes of officials of the Dominion Power and Transmission Co., Hamilton, Ont., have been made:—W. C. Hawkins, heretofore General Manager, Secretary and Chief Engineer, has been appointed Managing Director; E. P. Coleman, heretofore Manager of Railways, has been appointed General Manager; W. G. Angus, heretofore Electrical Engineer, has been appointed General Superintendent of Light and Power, and G. E. Waller, heretofore General Freight and Passenger Agent, has been appointed General Superintendent of Railways. The position of General Freight and Passenger Agent, has been abolished for the present.

Internal Combustion Manual.—This book of 146 pages, by F. W. Sterling, Lieutenant, U. S. Navy, published by the School of Marine Engineering, U. S. Naval Academy, Annapolis, Md., is intended as a text book for the use of midshipmen, but there is no reason why other students should not profit by the well arranged data here offered. Fuel being the fundamental that controls design and operation, this subject is first presented. After considering fuel, ignition, cooling, and lubrication in their relation to the engine, these four operations are shown combined in some of the latest and most approved types of engine. The producer plant is given a chapter to itself. For so short a course, the subject has been treated in a very sensible and satisfactory manner.

The Lemieux Act.—The labor congress which met at Guelph, Ont., recently, reaffirmed the decision of the meeting at Calgary, Alta., last year, and decided to petition Parliament to repeal the Lemieux Act, under which, boards of conciliation in labor disputes are appointed. Magnus Sinclair, of the electric railways employes union, spoke in opposition to the act, pointing out that the Montreal St. Ry. Co. had obtained an injunction restraining the board which was appointed, from holding an enquiry. President Lowe, of the maintenance of way employes union, supported the act, as also did D. Campbell of the telegraphers union.

The Canadian Northern Quebec Ry. roundhouse at Longue Pointe, Montreal, together with four locomotives, was destroyed by fire, Oct. 11. The damage is estimated at $125,000.

Electric Railway Projects, Construction, Betterments, Etc.

Berlin and Waterloo St. Ry.—The Berlin, Ont., city council has under consideration plans for increasing the capacity of the car barn at Berlin. (June, pg. 308.)

Brandon, Man.—The city council has under consideration the building of car barns and power plant for the electric railway, on land owned by the city. (Oct., pg. 520.)

British Columbia Electric Ry.—A committee has under consideration proposals for a consolidate franchise for 25 years for South Vancouver, Point Grey, Hastings townsite and D.L. 301. The question of extension of lines in these places has given rise to considerable discussion for some time past, and the present committee is working on a new attempt to have the necessary lines built.

Cars are being operated over the line just completed from Kerrisdale station along Wilson road, to Dunbar st., about a mile. Connection is made at Kerrisdale station with the Vancouver and Lulu Island Ry., which is operated by the company.

A new line from New Westminster to Queensborough has also been put in operation. (Oct., pg. 520.)

Calgary Municipal Ry.—The citizens of Calgary, Alta., have by a very large majority carried the bylaw confirming an agreement with a southeast Calgary company as to the building of an electric railway there. About a mile of line is to be built from the present terminus of the city car line, to the eastern limits of the city, and handed over to the city as a free gift, for operation. (April, pg. 196.)

The Edmonton Interurban Ry. was incorporated by the Alberta Legislature in 1910 to build a number of electric railways radiating from Edmonton. The company is reported to have been reorganized in September, and to have entered into an agreement with the Franco-Canadian Corporation for financing. An office has been opened at 248 Jasper ave., Edmonton, and Mr. Kimpe is reported to be Managing Director in charge, with J. H. Pickard as Vice President. The company was reported, Oct. 11, to have entered into a contract with J. W. McLeod, for the building of a line from Edmonton to St. Albert, of six miles. At this point a power house is to be built and equipment installed sufficient to operate 26 miles of line. Work is reported to have been started, and it is expected to have the line completed by June, 1913. The line starts at Queen Mary park, where a station will be built for the transfer of passengers and freight to the municipal line, if satisfactory arrangements can be made. It is proposed to equip the line with 60 ft. passenger cars having a compartment for express, parcels and baggage; and cars for coal and general freight. The lines projected by the company, M. Kempe is reported as stating, will be as follows:—To Beaver Lake and Tofield, 40 miles; to Vegreville, 60 miles; to Pigeon Lake, 40 miles; to Lac Ste. Anne, 56 miles; to Mowassin, 45 miles; to Namayo, 12 miles; to Morinville by way of St. Albert, 18 miles.

Edmonton Radial Ry.—The Mayor of Edmonton is reported as stating, Sept. 11, that the city council was planning to extend one of its lines to St. Albert, by way of Calden and the terminus of the Edmonton, Dunvegan and British Columbia Ry., next year, and that a right of way had practically been secured without cost. Some grading is reported to have been done. (June, pg. 308.)

Grand Valley Ry.—E. B. Stockdale, receiver of the G.V. Ry., is reported as stating that the company's lines in Brantford, Ont., are to be put in first class condition before the winter, and that a good deal of work, with this end in view, has already been done. (Mar., pg. 147.)

Guelph, Ont.—Press reports state that U. S. interests are endeavoring to secure franchises for the building of an extensive system of electric railways radiating from Guelph, and serving particularly Puslinch Lake, Hespeler, and Preston to the south, and as far as Arthur northerly. It is stated that those interested are desirous of obtaining the use of the Guelph Radial Ry. tracks and the surrender of that municipally owned railway's charter to Puslinch Lake, etc. (See Guelph Radial Ry., May, pg. 251.)

Kingston, Portsmouth and Cataraqui Electric Ry.—The city council of Kingston, Ont., has under consideration the question of repairing certain streets on which the electric railway is being operated, and of having new steel rails laid at the same time. The matter is still being negotiated between the parties. (Aug., 1910, pg. 682.)

Lake Erie and Northern Ry.—The plans for the line from the proposed terminus at the corner of Colborne and Clarence streets, through Brantford, towards Galt, Ont., have been prepared for submission to the city council. This portion of the line includes some rather difficult pieces of engineering. The plans for the entry into Galt were submitted to the city council, Oct. 8. W. P. Kellett, Brantford, is Chief Engineer. (Oct., pg. 520.)

Lethbridge Municipal Ry.—The municipally owned electric railway in Lethbridge, Alta., was reopened for traffic, Sept. 12. The city council's street railway committee has under consideration plans for the extension of the line during 1913. (Oct., pg. 520.)

London Street Ry.—In connection with the proposed north end extension the company has made application to the London, Ont., city council for permission to cross the C.P.R. tracks at Adelaide street. The company desires that the city should join it in making the necessary application to the Board of Railway Commissioners. (Oct., pg. 520.)

Medicine Hat, Alta.—Application has been made by a syndicate, headed by Sir Max Aitken, Montreal, to the Medicine Hat, Alta., city council for a franchise for an electric railway. The council is of opinion that the city could not finance such an undertaking itself, and that if the citizens demand a line at once, the only way to get it is by granting a franchise. No decision has been reached. (May, pg. 252.)

Montreal and Southern Counties Ry.—The Minister of Railways has approved of route map for the proposed line from Ranelagh to Laprairie, Que., four miles.

An agreement was signed Oct 3. by which the town of Greenfield Park, adjoining St. Lambert, grants the company a 21 year franchise for an electric railway within its limits. The line is expected to be in operation by the end of the year. (Oct., pg. 520.)

Montreal Tramways Co.—An order was issued Oct. 8, by the Quebec Public Utilities Commission directing the company to build certain extensions of lines in order to provide additional routes and so avoid congestion of traffic. (Oct., pg. 520.)

We are officially advised that the only extension ordered by the Public Utilities' Commission was for half a mile of single track on Westminster avenue, Montreal West. This work is already in hand, and was expected to be completed Oct. 30.

The order made by the Quebec Public Utilities Commission directs, among other

things, that the company shall at once start, and complete with due diligence, a line to Montreal West. (Oct., pg. 520.)

Morrisburg and Ottawa Electric Ry.—At the annual meeting in Ottawa, Oct. 8, the directors were authorized to start construction in May next. The question of letting a contract was left in their hands.

Following are the directors and officers for the current year:—President, J. G. Kilt, Morewood, Ont.; Vice President, H. McDonald, Ottawa; other directors, J. Oliver, R. E. Reardon, J. W. Bogert, Morewood, Ont.; W. C. Strader, Williamsburg, Ont.; R. J. Biggar, Ottawa; Secretary-Treasurer, R. A. Bishop; Solicitor, G. D. Kelley; Auditor, G. L. Blatch. (Oct., pg. 520.)

Mount McKay and Kakabeka Falls Ry.—The Board of Railway Commissioners has rescinded the clause of the order of Aug. 14, directing the company to use steam as a motive power for its cars in passing over the C.P.R. at Neebing Ave., between Fort William and Neebing tp., Ont. (June, pg. 309.)

Niagara, Welland and Lake Erie Ry.—The taxpayers of Welland, Ont., have approved a bylaw granting a right to build an electric railway through a section of the industrial district being opened up by the Canadian General Securities Co., Toronto. (Oct., pg. 521.)

Press reports state that the work of extending the line to the suburb of Dane City, and to Rosedale, Welland, Ont., will be completed this fall. (Oct., pg. 530.)

Niagara, St. Catharines and Toronto Ry.—The Board of Railway Commissioners has approved of revised location plans for the extension of the line from St. Catharines to Niagara-on-the-Lake, through Louth and Clinton townships, mileage 0 to 10.59. (Oct., pg. 521.)

Nipissing Central Ry.—We are officially advised that the Timiskaming and Northern Ontario Ry. Commission, which now owns the N.C. Ry., proposes to equip with electricity one track, on the double track line between North Cobalt and Cobalt, Ont., to allow the N.C. Ry. to operate its cars into Cobalt station. The details of the work to be done have not been arranged.

The line from Cobalt enters Haileybury by Georgiana and Ferguson avennes, terminating at Ferguson avenue and Browning street. The plans for the extension of the line show that one section will be built from the present terminus to the terminus of the Haileybury spur line at the lake shore end of Florence street, and another section, to be known as the Foster spur, from the end of the Haileybury spur on Farr street, and the lake shore road to the foot of Elliott street. The principal gradient on the first named section will be 1.7%, and on the second 2%, with a fair amount of curvature in each case. The Haileybury spur will be utilized to the junction with the Timiskaming and Northern Ontario Ry.'s main line, which will be utilized to near the boundary between Bucke and Dymond tps., whence an independent route will be followed into New Liskeard, to the Wabi river bridge, on Armstrong avenue. The principal gradient will be 2.66%, increasing for a short distance to 3.5%. This will be on leaving the T. & N.O. Ry. to get to the level at Lake Shore road. The extensions are under construction, but it has not been decided when they will be opened for traffic. (Oct., pg. 521.)

Ontario, West Shore Ry.—At a recent meeting at Goderich, Ont., between J. W. Moyes, the promoter of the line, and representatives of the municipalities which guaranteed bonds, Mr. Moyes is reported as having stated the position of affairs as follows: The total expenditure on the road this far had been about $650,000, which includes the $400,000 of bonds guaranteed by the municipalities; $75,000 or $80,000 of moneys raised on the $200,000 of unguaranteed bonds which had been hypothecated therefor; and the balance from other sources. He claimed to have put in $170,000 of his own money. Completion was made impossible by the Hydro-Electric Commission stepping into the territory with its power development scheme, which prevented the sale of the Maitland river Power Co.'s bonds and the further advance of money to complete the road. He had made three offers to the Commission regarding the Maitland river scheme, but could not get an agreement. If the municipalities would in some way that might be agreed upon, either by further guarantee or in some way, assist to release these hypothecated bonds, they could be sold for enough to complete and put in operation the road, and he was willing for the railway company that the municipalities should get in return for this assistance a $100,000 bond interest in the road and representation on the directorate. If the Hydro-Electric Commission would give a definite assurance of a power supply the completion of the line could be financed.

It was agreed that a deputation from the municipalities should wait on the Commission to see what could be done; and to secure a report on the cost of the work done from an engineer, preferably H. W. Middlemiss, Consulting Engineer of the Ontario Railway and Municipal Board. (Sept., pg. 468.)

Ottawa and St. Lawrence Electric Ry.—North Lanark Ry.—The first named railway is projected by a company bearing that title, and incorporated by the Ontario Legislature in 1908. In 1911 it secured an extension of time for construction for five years. Among the powers conferred was the right to require the charter of the North Lanark Ry., which was incorporated by the Ontario Legislature in 1898, and the Cornwall Electric Ry. In 1911 the N.L. Ry. secured an extension of time for construction for five years. Surveys have been made, but nothing has been done in the way of construction. We have been officially advised that the charters of the O. and St. L. E. Ry. and of the N.L. Ry. have been acquired by J. A. Morden and Co., Toronto, and that they have been amalgamated, the prospectus issued stating that the amalgamated company will now be known as the Ottawa and St. Lawrence Electric Ry.

A map, issued with the prospectus, shows a line from Ottawa to Morrisburg, with a branch from Kenmore to Russell; a line from Morrisburg to Cornwall, at which town connection can be made with the Cornwall Electric Ry., and running powers secured over it. From Morrisburg the line is shown along the St. Lawrence river to Brockville, thence northerly through Athens, Perth and Lanark to Brayside, on the Ottawa river, which is followed easterly to Ottawa. A branch is shown from Lanark to High Falls. This covers practically the whole of the mileage authorized to be built by the two companies—204 and 70 miles respectively. There are no engineering difficulties, 75% of the grading being over cultivated land, much of it at a dead level. The surveys were made under the direction of A. H. N. Bruce, M. Can. Soc. C. E., Ottawa, who estimated the cost of construction at $11,000 a mile for 234 miles and $13,000 a mile for 40 miles.

The company is being reorganized, and we are advised that it is expedient to put the line from Ottawa to Morrisburg under construction this fall, the Ottawa and St. Lawrence Construction Co. having been given a contract for the entire line. (Sept., pg. 468.)

Ottawa Electric Ry.—The bylaw to give effect to the agreement as to extension of the lines in the city will be submitted to the taxpayers at the elections, Jan. 1. (Oct., pg. 521.)

Regina Municipal Ry.—The city council of Regina, Sask., has approved of the programme of extensions of the lines for 1913. This provides for the laying of a second track on two existing lines, and the laying of 12 single track and six double track extensions. The estimated total cost of the new construction is nearly $700,000. The necessary bylaw will be submitted to the electors at an early date. (Aug., pg. 421.)

Saskatoon Municipal Ry.—The electric railway under construction in Saskatoon, Sask., consists of 12 miles of single track, but as there will be 1.5 miles of double track, the total length of track will be 10.5 miles. Four miles will be laid with 80 lb. steel, and the remainder with 60 lb. The rails are to be laid on cedar ties embedded in concrete on paved streets, and on cedar ties with ballast on improved streets. The bridge crossing the Saskatchewan river to the Nutana side has been taken over by the city from the province, and a double track is to be laid over it. The car barn, 90 by 160 ft., is on the west side, over the C.P.R. tracks. It is one storey, containing six tracks, office, quarters for the men, and a repair shop. Power will be obtained from the city power house. It is expected to have the line completed and in operation by the middle of December. (Oct., pg. 521.)

St. John Ry.—Press reports state that in addition to extending its power transmission and electric lighting lines, the company proposes to add considerably to its power house plant. (June, pg. 310.)

St. Laurent, Que.—The Franco-Belgian Investment Co. is making application to the council of St. Laurent parish, Que., for a franchise for an electric railway, as well as for lighting and water supply. The company has power under a general charter granted under the Dominion Companies Act, to acquire gas, electric light, electric railway undertakings, etc., and is reported to have a working understanding with the Montreal Tramways Co. O. L. Robitaille, Montreal, is a provisional director.

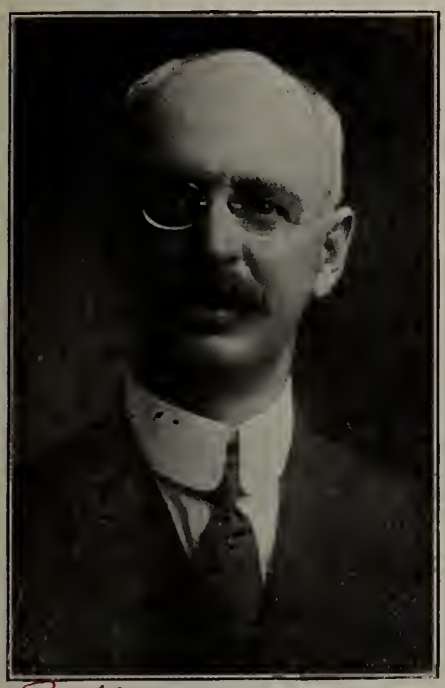
At a meeting of the St. Laurent council Oct. 7, a bylaw granting a 25 years franchise for an electric railway to the Franco-Belgian syndicate was read and considered. The bylaw was opposed on behalf of ratepayers, on the ground that the granting of the franchise would be prejudicial to the town's interests when the question of amalgamation with Montreal came up for consideration, as it would at no distant date. No definite action was taken.

Stratford Ry.—A press report states that plans have been filed for the building of 6.85 miles of electric railway in Stratford, Ont. The local papers make no reference to this, but state that on Oct. 7 Sir Wm. Mackenzie informed representatives of the local company that it was intended to build the line, and that instructions had been given to work out the best possible arrangements and terms. W. H. Moore and J. E. Robbery have been in stratford frequently before and since that date, and it is said that an agreement for a new franchise is being prepared for submission to the city council. (Oct., pg. 521.)

Toronto and York Radial Ry.—The charter of the section of the Scarboro division within the present city limits of Toronto expires Nov. 16, and the city council has instructed the Works Commissioner to arrange as to the terms upon which it is to

be taken over by the city. It is expected that the city will arrange with the company for the operation of the section of line as at present, until the city has made plans for operating it in connection with other civically owned lines. (Oct., pg. 521.)

Toronto Suburban Ry.—We are officially advised that it is possible that the gauge of this railway, 4 ft. 10½ ins., will be



P241 **E. P. Coleman,**
General Manager, Domin on Power and Transmission Company.

changed to standard gauge in the near future, but that no definite decision has been reached.

The extension which is being built from near Lambton, through Summerville, and Cooksville, to Georgetown and Guelph, is to be standard gauge. Good progress is being made with the grading on the Maher subcontract, which extends to Cooksville, and it is expected that the steel will be laid by Christmas.

Winnipeg Electric Ry.—We are officially advised that the Winnipeg, Selkirk and Lake Winnipeg Ry., a subsidiary company, has let a contract for the building of a line to Stonewall, Man., and that work will be started at once. The line will start from near Middlechurch, on the company's present line, follow the right of way of the Stoney Mountain spur, which has been acquired from the Winnipeg city council, and then on to Stonewall. (Oct., pg. 520.)

Personal Paragraphs.

Miss L. W. Moyes, second daughter of J. W. MOYES, promoter of the Ontario and West Shore Ry., was married in Toronto recently to J. H. Bickle.

JAS. GRAHAM, heretofore an erecting engineer for the Canadian General Electric Co., chiefly in the maritime provinces, has been appointed General Superintendent, Yarmouth Street Ry., Yarmouth, N.S.

LUDWIG ROTHERY, son of J. E. Rothery, General Manager Toronto & Eastern Ry., has resigned his position as Superintendent of construction in the Tri State Ry. & Electric Co.'s power house at East Liverpool, Ohio, to take a post graduate course at Toronto University, of which he is a graduate.

A portrait published in Canadian Railway and Marine World for September, and which had under it the caption, "F. D. BURPEE, Superintendent and Purchasing Agent, Ottawa Electric Ry.," was really a portrait of W. C. Lancaster, Electrical and Mechanical Engineer, Montreal Tunnel and Terminal Construction, Mackenzie, Mann & Co., the photographs received from the two persons named having been transposed in the office. Mr. Burpee's portrait is therefore given correctly in this issue. Biographical information respecting him was published in the August issue, pg. 419.

GEO. E. WALLER, who has been appointed General Superintendent of Railways, Dominion Power and Transmission Co., Hamilton, Ont., was born in Barton tp., Ont., Aug. 23, 1871, and entered transportation service in 1896, acting as conductor and motorman, Hamilton, Grimsby and Beamsville Electric Ry., and remained as such until 1897, when he was appointed agent, and in 1899, General Manager and Secretary, same road. He continued in that capacity until 1908, when he was appointed General freight and Passenger Agent, Dominion Power and Transmission Co., which position he held at the time of his present appointment.

C. B. KING, Manager London Street Ry., London, Ont., who has been elected Vice President Canadian Street Railway Association, and whose portrait appears in this issue, was born at Gallena, Southern Indiana, Sept. 12, 1871, and was educated at the public and high schools, New Albany, Ind., graduating in 1891. He entered electric railway service in its early days with the Louisville Ry., and served in its shops, and subsequently to 1895 in the stores department. In 1895 he entered the Detroit Citizens Street Ry. service and occupied various positions to 1905, chiefly as Assistant to the Vice President and General Manager, since when he has been Manager London Street Ry.

S. W. MOWER, for the last six years General Manager, London and Lake Erie Ry. and Transportation Co., and of its predecessor the London and South Western Traction Co., at London, Ont., has been appointed General Manager of the Otsego and Herkimer Rd., at Hartwick, N.Y., to succeed J. K. Choate, resigned. This company operates an electric line of 54.91 miles, connecting Oneonta, Hartwick, Cooperstown, Richfield Springs, Mohawk and Herkimer, N.Y., and reaches Utica by the Utica and Mohawk Valley Ry. It is advertised as "the most beautiful scenic route in central New York." It has 27 motor and 60 other cars, and operates 10 trains each way per day. Mr. Mower was in the Detroit United Ry. service before going to London.

EDWARD P. COLEMAN, who has been appointed General Manager, Dominion Power and Transmission Co., controlling various electric railways in and around Hamilton, Ont., and whose portrait appears in this issue, was born at Taunton, Mass., June 14, 1867, and educated at the public schools there. He was from Feb. 9, 1885, to Feb. 9, 1896, in the Hubec Printing Press draughting office at the Taunton Locomotive Manufacturing Co.'s shops, with which his father and grandfather were associated for many years; Jan. 1, 1896, to Sept. 1, 1900, Treasurer and General Manager, Attleboro Steam and Electric Co., Attleboro, Mass.; May 5, 1898, to Mar. 31, 1899, in United States service during the Spanish war as Second Lieutenant and Battalion Adjutant, 5th Massachusetts Infantry; July 1, 1899, to Sept. 1, 1900, General Manager, Plymouth Electric Light Co., Plymouth, Mass.; Sept. 1, 1900, to June 1, 1905, Vice President and General Manager, Consolidated Lighting Co., Montpelier, Vt.; June 1, 1905, to Mar. 1, 1907, in practice as consulting engineer, general, electric light, power, railway and quarry work, and Treasurer and Manager, Wetmore and Morse Granite Co., Montpelier, Vt.; Mar. 1, 1907, to Jan. 1, 1909, General Manager, Great Northern Power Co., Duluth, Minn.; and Mar. 1, 1909, to Oct. 10, Manager of Railways, Dominion Power and Transmission Co., Ltd., Hamilton, Ont.

PATRICK DUBEE, who has been elected President, Canadian Street Railway Association, and whose portrait appears in this issue, was born at Montreal, Mar. 4, 1876, and was educated at the Christian Brothers school and at St. Patricks academy, there. He started as office boy with the Montreal St. Ry., July 9, 1890, two years before the electrification of the road, and has remained in its employ ever since, occupying various positions in the offices of the Secretary, Comptroller and Manager, until May, 1901, when he was appointed Assistant Secretary at the time that W. G. Ross was appointed Secretary-Treasurer. In Dec., 1903, Mr. Ross having been elected Managing Director, Mr. Dubee was appointed Secretary. In 1903, when the Montreal St. Ry. Mutual Benefit Association was organized, the details were left in his hands, and he was subsequently elected a director and Secretary-Treasurer of the Association, and has occupied those positions continuously. The association thus organized is recognized as the most successful of its kind on the continent. In 1901, when the Montreal St. Ry. Co. acquired control of the Montreal Park and Island Ry. Co., he was also appointed Secretary of the latter company, and in 1904 on the organization of the Suburban Tramway and Power Co., he was also appointed Secretary-Treasurer, and in 1909, in addition, was appointed Secretary-Treasurer of the Longueuil Tramways Co. On the recent consolidation of the Montreal St. Ry. Co., and its subsidiary companies under the title of Montreal Tramways Co., he was

P306 **F. D. Burpee,**
Superintendent and Purchasing Agent, Ottawa Electric Railway.

appointed Secretary-Treasurer of the new company, which position he still holds. He has taken a very active part in the Canadian Street Railway Association's proceedings since its inception in 1904, having been a member of the executive committee for several years, and for the year 1911-12 Vice President.

Quebec Railway, Light, Heat, and Power Company's Report.

Following is the report for the year ended June 30, submitted at the recent annual meeting:—

The gross earnings from operation were $1,415,825.38, as compared with $1,280,126.76 in 1911, an increase of $135,698.62; the operating expenses were $734,925.35, as compared with $661,907.15, an increase of $73,018.20; the net earnings were $680,900.03, an increase of $62,680.42 over 1911, equal to 10.13%. After adding miscellaneous income, $194,584.46, and deducting fixed charges of $660,363.96, two dividends paid Oct. 15, 1911, and Jan. 15, 1912, amounting to $199,990, and organization expenses of $3,919.68, there remains a net surplus of $11,210.85, which added to surplus account leaves a balance of $73,539.45 to the credit of this account. Reserve accounts have also been created.

Assets.		
Investments—stocks, bonds and interests in other corporations	$22,819,192 64	
Less bonds of subsidiary companies outstanding	3,659,000 00	
		19,160,192 64
Treasury bonds		1,286,100 00
Advanced to controlled companies for construction, etc.		871,337 07
General construction		389,952 73
Underlying securities redemption fund		40,169 75
Cash on hand and in banks		254,513 25
Accounts and bills receivable		235,665 30
Stores and supplies on hand		136,739 87
		$22,374,670 61
Liabilities.		
Capital stock	$10,000,000 00	
Less unissued	500 00	
		9,999,500 00
Bonds	$14,600,000 00	
Less in escrow to redeem bonds of subsidiary companies.	$3,659,000 00	
Less unissued	220,600 00	
Less cancelled	114,000 00	
	3,993,600 00	
		10,606,400 00
Accounts payable		158,572 62
Sundry loans		1,171,968 01
Accrued interest		148,875 12
Unpaid interest and dividends		189,586 84
Accrued charges		3,154 10
Reserves		18,074 47
Surplus		73,539 45
		$22,374,670 61

RAILWAY DEPARTMENT.

Quebec Ry., Light and Power Co. City Division.

During the year the company continued its policy of improving its service, and the result shows new record figures, the increase in revenue passengers being 928,315 over 1911. More attention than ever has been devoted to repairs and renewals to the roadway. During July, 1911, another observation car built in the company's shops was added to rolling stock, making two now in use. The rolling stock has not only been maintained in good condition during the year, but considerable sums have been expended upon all departments in line with the policy to maintain the property and rolling stock in first class condition.

Montmorency Division.

This division again shows very appreciable gains, both in its passenger and freight service. About two and a half miles have been relaid with 80 lb. steel, the old rails being used for sidings at various points. Terminal facilities in the city of Quebec have been very considerably improved to cope with the rapidly increasing traffic. All property has been maintained in a proper state of efficiency, and a considerable sum has been spent on the upkeep of the tracks and rolling stock. The Kent house and amusement park are becoming increasingly popular as resorts.

QUEBEC COUNTY RAILWAY.

This railway continues to make satisfactory progress, the number of revenue passengers carried being 137,216 in excess of last year, an increase of 54%. The road and track have been maintained in good condition.

QUEBEC AND SAGUENAY RY.

(Under Construction.)

This railway extends from mile 30, the termination of the Montmorency division, to mile 85.5, Pointe au Pic. Good progress has been made, approximately 85% of the work being completed. $104,992 was received on account of Dominion government subsidies, and this was applied to the redemption of bonds according to the trust agreement.

LOTBINIERE AND MEGANTIC RY.

This railway runs between Lyster and St. Jean Deschaillons, Que., 30 miles. It was taken over by the company during Feb. The road is of standard gauge, 56 lb. rails, and serves a very good lumber territory. It was acquired in connection with the purchase of the charter of the Quebec Eastern Ry. It was taken over as a going concern and its revenues have been taken into the earnings of this company.

POWER AND LIGHT DIVISION.

The consolidation under the direction of R. S. Kelsch, Consulting Engineer, of the various power supplies at the Queen street sub-station has been completed and is a great advantage both to customers and the company itself, guaranteeing as it does a service free from interruptions or breakdowns, the company being able to utilize power from any one or all of its hydraulic stations and its steam plant for its various lighting or power requirements. Special attention has been paid to the distribution system and a large sum has been expended in repairs and replacements. Several important power contracts are in view for the coming year and the outlook is bright.

2,006 ft. of new gas mains were laid during the past season. The new installations total 564, including stoves, radiators, heaters, etc.; 311 new meters were added. In line with the policy to put all the property in the best possible condition, over 38,000 ft. of the distribution system was gone over, thoroughly examined and repaired.

The increase in gross earnings from operation of $135,698.62 demonstrates not only the increased growth of business, but also of the city and district served, and it is the opinion of your directors that this increased growth will continue. A feature of the financial report is that while a large sum has been spent on the upkeep and improvement of various plants, the percentage of operating expenses to gross earnings remains at the low figure of 51.91%.

The completion of the new office building at the corner of Crown and St. Joseph streets was unfortunately delayed until May. The completion of the building enables the consolidation of the executive offices in the one building and has facilitated the transaction of business. Considerable office space has been rented in the building.

The Vancouver Island Electric Ry. Co. is applying to the British Columbia Government for licenses to store or pen back water on the Sproat and Campbell rivers, and to take and use water from the Campbell and Stamp rivers and Qualicum creek for the development of electric current for railway and power purposes. The company proposes to build a transmission line to Nanaimo, and to build electric railways. The applications are signed by E. Bottomley, agent for the company.

The pay-as-you-leave car, put into operation by the Cleveland (Ohio) Railway, has been withdrawn after a trial of several months. While loading such a car is expeditious, it was found that unloading is very slow and that on the whole the disadvantages more than offset the advantages. The fare box will be placed in the rear of the car, and it will hereafter be operated in the same way as the pay-as-you-enter cars.

The New Orleans and Grand Isle Traction, Light and Power Co., of which C. E. A. Carr, formerly of Quebec, is General Manager, intends to apply to the Dominion parliament next session for an act to authorize the company to acquire and operate railways, tramways and telegraph and telephone lines outside of Canada; to change the name to the New Orleans and Grand Isle Ry., Light and Power Co., Ltd., and to issue to holders of its shares who may desire the same share warrants to bearer in the usual form in lieu of the stock certificates representing such shares.

Railway Ties Bought in 1911.

There were 13,683,770 cross-ties purchased in Canada in 1911, according to statistics compiled by the Department of the Interior's forestry branch. This is an increase of 4,469,808 (48.5%) over the number purchased in 1910. The increase is largely due to railway construction, which was especially noticeable in the western provinces. The replacement of ties on existing lines amounted to about 10,000,000.

Eighteen kinds of wood were used, jack pine standing first in importance, numerically, with about 40% of the total. Tamarack stood second with almost 19%. Douglas fir with 14% and hemlock with 12% occupied third and fourth places, respectively.

The average price of ties in 1911 was 39c., one cent more than in 1910. Southern pine ties at $1.10, imported from the United States, were the most expensive, and spruce trees at 26c. were the cheapest. The sawn tie is increasing in favor, evidently, as 70%, or 3% more than in 1910, were the product of the mill. Sawn ties cost, on the average, 41c. each, or 4c. more than hewn ties, while in 1910 the hewn ties were the more expensive by 3c.

Only 206,209 ties, or 1.5% of the total number purchased, were given preservative treatment. However, this is practically a clear advance over 1910. Two treating establishments are now in operation. On the average, the treatment of ties prolongs their life by 10 years. It is estimated that at least 350,000,000 feet, board measure, could be saved annually through this process.

Marine Department.

Dominion Hydrographic Survey Steamship for Atlantic Coast, Hudson Straits and Bay.

A preliminary description of this vessel was given in Canadian Railway and Marine World for July, an illustration of the profile was published in the August issue, and tbe letting of the contract for construction at Wallsend on Tyne, Eng., was announced in tbe October issue. Following is a more complete description:—

Owing to the conditions that will be encountered in surveying Hudson bay and straits this vessel has received special attention in design to meet the severe ice conditions under which she is likely to operate, and in determining the type of ship this had also a considerable influence and it was deemed advisable to depart from the two recent vessels designed for the above department, consequently a spar deck type was considered advisable. Also, to meet the severe conditions referred to, it was decided to build her along the lines that practice has determined as being most suitable for the ice boats in operation in Newfoundland. The bow or forefoot will therefore be well cut away and well rounded at the bottom where the plates are moulded into the stem, giving quite a spoon effect to the lower part of the forefoot so that the boat could easily ride over or upon the ice obstructions.

In frame this vessel will be considerably heavier than required for classification in Lloyds 100 A1, and the half length forward will not only be considerably heavier in frame, but the frames will be spaced much closer together. From one third the length abaft the stem the frames will be only 16 ins. apart. From there to one half the length they will be 18 ins. apart, and the balance tbe usual pitch determined by Lloyds.

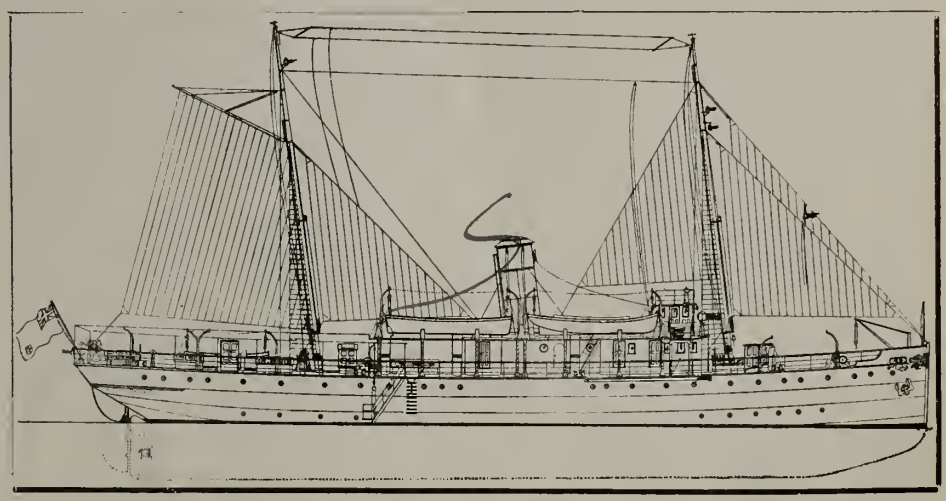
It was considered desirable to considerably increase the plating of the forward end of the ship. Consequently all plating for the forward half length will be twice as thick as that called for by Lloyds, and the two strakes at the water line will be twice as heavy as that demanded by Lloyds for the full length, it being assumed that after the bow has broken up the ice, that in its travel aft these two upper strakes should be protected. In fact, the designer, after a visit to St. Johns, Nfld., felt satisfied that she will be in every way suited for the purpose intended.

It was decided to maintain a very minute water tight subdivision. Consequently this boat could easily flood two or more of her compartments and still be perfectly seaworthy, a condition, however, that would not very likely occur. Notwithstanding, in as much as she will operate so far from her base it was considered advisable to take no chances. In her ability to meet and pass through large floes of field ice she will have very few equals.

The type of boat adopted, as before stated, is a shelter deck ship built of steel throughout, with scantlings practically twice as heavy as required by Lloyds. She will have a straight stem and elliptical stern, with two pole masts of wood, equipped with a full outfit of sails and all necessary standing and running rigging. The forward end of the spar deck will be specially stiffened from the stem to back of the breakwater, and under the windlass and cables special teak beds will be provided, and in addition this deck will be specially stiffened by extra pillaring to the main deck. The star deck will be steel plated throughout, and then covered with Oregon pine with teak margins. The main deck will be plated amidships over and around the machinery spaces and then laid with Oregon pine. The orlop decks will be plated and all caulked water tight, so that if these orlop decks are considered as tank tops there will be a double bottom throughout her complete length, although what is usually understood as double bottom will extend only from the aft engine room bulkhead to the forward bunker bulkhead. This space will be divided into three compartments transversely and then subdivided longitudinally by the centre keelson, making practically six separate water tight compartments. To carry the watertight subdivision to a further point the longitudinal bunker bulkheads in both engine and boiler spaces will also be watertigbt.

On the boat deck will be stowed two 27 ft. gasoline launcbes of a type that bas been demonstrated by the Canadian Hydrographic Survey as most suitable for this work. The engines used in these launches will be the standard of New Jersey. Abaft of the launches will be stowed two 27 ft. cutters, also specially equipped for surveying service. These launches and boats will be swung in and out by a complete outfit of Welin davits and chocks.

On tbe spar deck will be placed the usual steam windlass and abaft this a deep breakwater to throw over any water that she may shed. Then will come a spacious chartroom, the sailing master's bedroom and day cabin, and the coxswain's storerooms, and abaft the engine and boiler casings a wireless office and a stateroom for the wireless operator. On the aft end of this deck will be a complete sounding outfit, including a deep sea sounding donkey, and on the port quarter aft will be a specially designed steam driven sounding machine and on the



Dominion Government's Hydrographic Survey Steamship for Atlantic Coast, etc.

The vessel over all will be 182½ ft. long; length between Lloyds perpendiculars, 170 ft.; beam moulded, 33½ ft.; depth moulded to upper deck, 13½ ft.; displacement on mean draft of 11 ft., 1,050 tons, with 250 tons of coal on board and 60 tons of stores and water; speed on the above displacement 12½ knots for a 10 hours continuous trial.

On the boat deck will be placed the pilot house, to be heavily built of teak and the interior lined in quarter oak and the house then bolted by a series of sceptre bronze bolts to the chart house. On the top of the pilot house will be the standard compass, and owing to the dip of the compass in the northern latitudes in which this vessel will operate it is specified that no iron work shall be nearer this compass than 18 ft., and to fulfil this requirement it was found necessary to make the greater portion of the chartroom of sceptre bronze, which possesses very remarkable qualities as it is found that the galvanic action that usually takes place between bronze and iron in sea water in this case is at a minimum, and is practically a negligible quantity.

starboard quarter a submarine sentry. On this deck also will be placed the small dinghy for ship's use, and on the port quarter aft this dinghy a sounding platform and two additional sounding platforms under the bridge at this level, one port and one starboard.

Immediately abaft the engine hatch will be a powerful steam winch, for warping ship and in addition for handling the falls of the boats and launches.

It is expected that when this vessel proceeds north for her season's work, she will carry quite an extensive outfit, and to handle this outfit there will be three pairs of extra davits on the spar deck and two 3½ ton cargo booms, one to the mainmast, one to the foremast.

Special reference should be made to the chartroom, which will really form the ship's workshop. In it after the several boats have done their day's work, will be plotted the results, on a preliminary chart. Consequently it has received special attention. In the centre of the room will be a large chart table under which will be a lot of drawers for stowing the complete and in-

complete charts. In the corners on the aft side of this room will be cabinets for carrying the scientific instruments and overhead a speaking hood for communication with the pilot house, so that the officer in charge of the survey, when deep sea sounding with the ship proper, can from the chartroom dictate and check her course. The chartroom will be neatly panelled in quarter oak and the floor laid in linoleum, making when complete a remarkably comfortable workshop.

The main deck will be devoted entirely to the accommodation of the crew and surveying staff. In the extreme forward end of the ship will be the general storeroom, in which will be stored gasoline. When carrying gasoline this storeroom will be open thoroughly to observation, being only closed by a collapsible iron fence, so that in case of fire it can be readily seen and completely exposed for treatment. Abaft this port and starboard will be the crew's offices, including boatswains' stores, carpenter shop, and in the centre a large room for cold storage, on the forward end of which will be placed a no. 3 refrigerating machine. Abaft of this will be a space occupied by ladders giving access to the firemen's and seamen's quarters, and in the wings of this space will be hooks for hanging the seamen's oilskins, and also the fresh water drinking tanks. Then will come the cabins for the accommodation of the petty officers, eight in number, all fitted in pine, with hardwood berths, and neatly painted. The centre of this space will be devoted to their mess. Then will come the machinery space, and above the boilers on this deck at the aft end of the boiler room will be a large galley. In the wings of the engine room on this level, accommodation will be provided for chief engineer, engineers' bathroom, cabin for 2nd and 3rd engineers, and officers' toilet, all on the port side. On the starboard side will be the mess room for these officers, and a stateroom for the two mates. Then will come the lobby immediately abaft the steering engine room, giving access to the quarters devoted to the surveying staff. This will consist of a wardroom, provided with sideboard and dining table, and on the port and starboard sides of this wardroom will be six staterooms neatly fitted out for the accommodation of the junior staff of the surveying branch. On the starboard side, forward of these rooms, will be their pantry, and on the port side their bathroom and toilet, making them entirely independent. Abaft of these accommodations will be placed the accommodation for the hydrographic officer in charge of the survey. This will consist of a saloon panelled in mahogany, a stateroom and a large bathroom and wardrobe. The fantail abaft of this will be devoted to general stores.

The forward orlop deck will be devoted to storeroom, general locker, accommodation for eight firemen on port side and 12 seamen on starboard side, and a room for the accommodation of eight additional seamen that would form special survey parties independent of the crew. Then will come the machinery space, and on the aft orlop deck will be four more staterooms devoted to the surveying staff and extensive storerooms and lockers.

Everything has been done as far as possible to make the ship complete for the purpose intended. The navigating outfit will be as complete as can be made, and the compasses, three of which will be fitted, will be of the Kelvin White type. There will also be located in the saloon of the officer in charge of the survey a chronometer locker containing five chronometers, all of the best manufacture.

The propelling machinery will consist of a vertical inverted three cylinder triple expansion engine, with cylinders 17½, 27½, 47, and a common stroke of 28 inches. This engine will drive a four bladed sceptre bronze propeller about 10 ft. in diameter and 9 ft. pitch, and revolutions of from 150 to 160, with a steam boiler pressure of 185 lbs. There will be two Scotch boilers, each 11½ ft. long and 11¼ ft. mean diameter, having about 78 sq. ft. of grate surface and a collective h.s. of 2,800 sq. ft., all built to Lloyds highest class and tested for working pressure of 185 lbs. These boilers are to be fitted with the latest type of heated draft, driven by a 54 in. blower. The auxiliary machinery in the engine room will consist of an independent air pump, a steam dynamo, one duplex feed pump, one auxiliary feed pump, one fire and bilge pump, one sanitary pump, one 10 ton evaporator, and a distiller with a capacity of not less than 1,600 gallons of potable water in 24 hours. All the machinery to be of the best make and manufacture.

The main condenser will be built up of wrought steel and fitted complete internally with sceptre bronze tube sheets and tubes for the reasons as before specified. This condenser will be of the uniflow type and is designed to give 27 ins. of vacuum under the most extreme conditions. The stern tube, also a special feature, will be of cast steel, and the shafting throughout is to be not less than ¾ in. diameter larger than the diameters called for by Lloyds.

She will be further equipped with two independent propellers, one for ordinary work when clear of ice, of the built up type, all of sceptre bronze. The other propeller is to be of steel throughout and of heavy dimensions, built for ice work alone.

Another special feature will be the dynamo, to be driven by a two cylinder compound engine enclosed and with forced lubrication. An independent booster will also be fitted, so that any over load will be discharged into a series of hermetically sealed cells. These cells will be for use at night only and are to be of such capacity as will carry 32 lights for 12 hours without any undue falling off in light.

It is expected that the vessel will be completed by July next, in time for the opening up of the Hudson bay navigation, and that she will be the latest type for the purpose intended.

The New Grain Elevator for Montreal.

The new concrete grain elevator, which the Montreal Harbor Commissioners have built to enable them more efficiently to cope with the grain situation in the harbor, was officially opened by the Minister of Marine, Oct. 3. The construction was decided on in 1910, and the specifications provided for a capacity of 1,772,000 bush., but during construction it was discovered that this capacity would be insufficient to meet the needs of the port, and additional storage capacity was ordered for another 850,000 bush., making a total storage capacity of 2,622,000 bush. The elevator, with the storage addition, occupies a space of 456 ft. 8 ins., by 100 ft., and is 220 ft. high. The structure is erected on filled ground along the waterfront, where there is an approximate average level of 25 ft. The rail level is at high water mark, and to provide for the deep receiving pits a large portion of the excavation for the main elevator was carried down about 20 ft., and the whole area of the main building was excavated to low water level and wooden piles driven. On these piles, reinforced concrete 3½ ft. thick was laid, and concrete piers and walls built on this foundation and carried to track level. The track girders are of reinforced concrete, except over the receiving pits where they are of steel, as are also the boot tanks and track hoppers. The foundation of the additional storage capacity was arranged differently, as, owing to there being no elevator legs, such deep excavation was not necessary. Reinforced concrete piles were driven, with their tops about 4 ft. below the base of rail, and on these the concrete foundation was laid. There are four tracks through the elevator, with bin openings 22½ ft. above. The bin columns are of reinforced concrete spaced 24 ft. centres each way, with heavy reinforced concrete girders supporting the bins. The curtain walls are of concrete and the windows are fireproof. The bins are also of reinforced concrete, 86 ft. deep, with walls 8 ins. thick, and capacities ranging from 6,800 to 14,300 bush. There are 278 bins exclusive of shipping bins. The upper portion of each bin along the waterside is used as a shipping bin, an intermediate concrete bottom being placed about midway. The cupola is built entirely of reinforced concrete, the lower sides of the floor and roof beams being chambered. It is 107 ft. high above the bin walls and 220 ft. above base of rail. The marine tower for unloading vessels is erected on a jetty, and is so placed that two vessels may be dealt with at the same time. It is 310 ft. from the elevator, and is of structural steel, with a steel gallery running from the tower to the elevator, carrying the conveyors which take the grain from vessels to the elevator.

The general equipment includes four receiving tracks, 24 track hoppers and 12 receiving legs, each leg being fed from two hoppers, interlocking valves being used to prevent grain from reaching the leg from more than one hopper at a time. The arrangement of the track hoppers is such that the unloading of a car on one side of the leg is independently carried on and may proceed simultaneously with the unloading of a car on the other side. The elevator will be capable of receiving 240 cars in 10 hours under ordinary conditions, and this can be increased. The marine tower is equipped with two marine legs with an hourly capacity of 20,000 bush. The grain is weighed by Fairbanks continuous automatic weighing machines, and the shovel apparatus is operated by air, while the best equipment for handling the machinery is provided. Cleaning and drying machinery are also included in the equipment, and power is supplied by electric motors of the induction type.

The designers and constructing engineers of the elevator are John S. Metcalf Co., Ltd., Montreal.

Largest Floating Dry Docks in the World.

Following is a list of the largest floating dry docks, by which it will be seen that the one which has been located at Montreal stands fifth as regards lifting capacity and length:—

Dock	Lifting capacity Tons	Length Ft.	Clear width Ft.	Depth over keel blocks Ft.	Owners
Kiel	40,000	656	154	35½	German Govt.
Hamburg	35,000	790	108½	33	Blohm & Voss
Medway	32,000	680	113	36	British Govt.
Portsmouth	32,000	680	113	36	British Govt.
Montreal	25,000	600	100	27½	Canadian-Vickers Co.
Hamburg	25,000	525¾	108½	35	Vulcan Co.
Pola	22,500	584¾	111½	37	Austro-Hung. Govt.
Rio de Janeiro	22,000	550	100	30	Brazilian Gov.
Hamburg	20,000	511½	97	26	ReiherstiegCo.

An order in council has been passed changing the name of the steamboat John B. Trevor, to Atikokan.

Collision Between s.s. A. W. Perry and Schooner Albert J. Luk.

Commander H. St. George Lindsay, R.N.R., Wreck Commissioner, sitting at Halifax, Oct. 3, assisted by Captains Neil Hall and J. W. Harrison, of Halifax, gave the following decision respecting the above mentioned collision which occurred on May 16:—

"Both vessels are to blame for the collision, inasmuch as the speed that each was making prior to and at the time that they came in sight of each other, was excessive, considering the dense fog prevailing at the time, and not in accordance with article 16 of the International Rules of the Road. Therefore the court censures both masters, and also censures the first mate of the A. W. Perry—W. A. Power—for not stopping the engines (vide art. 16) on first hearing the schooner's horn. The court severely criticizes the custom of the watch officer being in a pilot house in thick weather, with both doors closed, and the engine room telegraph situated on the bridge, out of reach of that officer, as not being conducive to safe and proper navigation, and the court also condemns the custom, which is said to be general in fishing schooners, of leaving the decks of these vessels in charge of two deck hands only. Under such weather conditions as prevailed on the night of the accident, the court considers that such a practice is to invite disaster."

Charges for Loading Grain at Port Arthur and Fort William.

A conference was held at Port Arthur, Oct. 8, between Jas. Playfair, President; F. King, Counsel, and F. S. Wiley, representing the Dominion Marine Association, and C. Tilt, President, A. C. Ruttan, Secretary, and others, representing the Lake Shippers' Association, when the following tentative agreement was arrived at:—

"It is agreed to suspend the Lake Shippers' Clearance Association's present tariff so far as it applies to vessels, from Oct. 15 to Nov. 25, 1912, inclusive, and to substitute the following:—

"(a) Vessels up to 125,000 bush. of wheat capacity, 30 cents per thousand bush. for loading within 24 hours of arrival, loading weather.

"(b) Vessels of 125,000 to 200,000 bush. of wheat capacity, 30 cents per thousand bush. for loading within 48 hours of arrival, loading weather.

"(c) Vessels of 200,000 or over bush. of wheat capacity as follows:—40 cents per thousand for loading in 24 hours; 30 cents per thousand for loading in 48 hours; 10 cents per thousand for loading in more than 60 hours; 20 cents per thousand for loading in 60 hours.

"If above time limits are exceeded in classes a and b the charge is to be 10 cents per thousand bushels.

"If delay is caused by non surrender of documents, the shippers are to be penalized by the Lake Shippers' Clearance Association to the extent of the estimated loss of revenue to that Association by reason of such delay.

"Sample cargoes to be loaded at 15 cents per thousand bushels straight.

"After No. 25, 1912, and until the close of navigation, the charge to be 20 cents per thousand bushels flat on all boats loaded.

"Time shall start from time of arrival ready for loading if such time is prior to 4 p.m. on a working day. If after that hour time shall start at 7 a.m. on the following morning if elevators not working during the night."

As above stated, the agreement is merely tentative and for a limited period and it is proposed to settle the whole question at a further conference during the winter. The important points of the present agreement are that it is an acceptance of the Dominion Marine Association's proposal to base the tariff of charges upon actual dispatch, that it is a frank open agreement that the most fruitful source of trouble is the shipper's delay in putting in his surrender, and that it is an agreement by the Lake Shippers' Clearance Association to try to discipline or penalize its members for such delays. The agreement is by no means perfect, but any faults or inconsistencies can be remedied during the winter, and in the meantime both associations are pleased to have found common ground to further negotiations.

Atlantic and Pacific Ocean Marine.

Canadian Northern Steamships, Ltd., has increased the number of its directors from five to six.

The Manchester Liners' s.s. Manchester Civilian, which is under construction in England for the Canadian trade, is expected to be completed shortly, when she will immediately be put into service.

The Elder Dempster Co.'s s.s. Canada Cape, which was at one time in operation between Canada and Cape Colony, and which was damaged at Cape Town some time ago, has been sold as she lies in her damaged condition at Southampton, Eng.

In connection with the recent collision between the C.P.R. s.s. Empress of Britain and the s.s Helvetia, in which the latter vessel was sunk and lost in the St. Lawrence, it is reported that the C.P.R. has arranged to give the owners £60,000 as compensation.

The Head Line s.s. Bengore Head, which stranded about five miles northeast of the Flower Island light, Oct. 6, floated the following day and put in at Fortune bay to await the arrival of a tug. She left Fortune bay Oct. 10, for Montreal, where an examination will be made.

The Canadian Northern Steamships, Ltd., has increased the number of its directors from five to six, R. M. Horne-Payne being the additional member of the board. The full board now consists of Sir William Mackenzie, Sir Donald Mann, Z. A. Lash, D. B. Hanna, A. D. Davidson and R. M. Horne-Payne.

The number and tonnage of ocean going vessels arriving at Montreal from the opening of navigation to Sept. 30, was 558, with a tonnage of 1,814,086 tons, being a decrease of 28 vessels and an increase of 58,580 tons, as compared with the same period in 1911. During past years there has been a steady increase in the tonnage of vessels using the St. Lawrence route.

The Minister of Marine, accompanied by a number of representatives of the shipping interests, made his annual inspection of the St. Lawrence ship channel early in October. Speaking at a dinner at Sorel, he stated that it was the intention of the government to make the channel the safest in the world. In a few years time there would be a 35 ft. channel, and he predicted great growth in the tonnage using the St. Lawrence route.

The report of Manchester Liners, Ltd., for the year ended June 30, shows profits of £101,946, a little over double those of the previous year. There are arrears of dividend on the 5% preference stock, covering 3½ years, which are to be paid off, and £45,000 has been written off for depreciation, leaving £10,100 to be carried forward. The company operates entirely between Canada and Manchester, Eng., and is a subsidiary of Furness, Withy and Co., who are largely interested in the Richelieu and Ontario Navigation Co.

On a recent westward trip of the Canadian Northern s.s. Royal Edward, an apparatus for the detection of the presence of icebergs, during fog, etc., was tested. It is described as an electric, automatic, self recording apparatus for taking the salinity of the water, with an automatic ice alarm which is sounded immediately the proximity of ice is discovered. This is achieved, not by the change in temperature of the water, but by the change in salinity, which is greatly reduced by the presence of icebergs. It is stated that the tests were extremely successful.

The s.s. Thyra Menier, which has been chartered by Henri Menier for the Anticosti island trade, is owned by the Donald Steamship Co., of Bristol, Eng., and New York, and was recently built at Newcastle, Eng. She is built on the arch principle, and is of the following dimensions:—length, 240 ft.; breadth, 36 ft.; depth, moulded, 16 ft. 5 ins., with 5 ft. 9 ins. arch. The propelling machinery consists of engines and cylinders 17, 28 and 46 ins. diar., by 33 ins. stroke, supplied with steam by two main boilers, 12 by 10½ ft., at 180 lbs., giving her a speed of about nine knots an hour. She will carry about 2,250 tons dead weight on 16 ft. draught.

Maritime Provinces and Newfoundland.

The work of construction on the pier at Halifax, which is a part of the general improvement of the harbor, is proceeding, but it is estimated that it will not be completed until next year. The cost is approximately $1,000,000.

The annual meeting of the Canada Atlantic Transit Co., was held recently. Following are the officers and directors for the current year,—President, E. J. Chamberlin; Vice President, H. G. Kelley; Secretary-Treasurer, F. Scott; other directors, W. Wainwright, J. E. Dalrymple, R. S. Logan and W. H. Biggar.

The Reid Newfoundland Co.'s steamship for the Cabot strait service, and the one for the Labrador service, descriptions of which have been given in a previous issue, are well on the way, and it is anticipated that the former will be ready for service about January, and the other in time for the seal fishery season.

The Canada Atlantic and Plant Line Steamship Co.'s s.s Evangeline, a description of which has been given in a previous issue, is announced to sail for Canada shortly, some delay having occurred on account of extra work to her interior fittings. H. L. Chipman, Manager of the company, superintended her outfitting.

The British government survey ship Ellinor, which has been engaged in survey work round Newfoundland and Labrador for some time, has been removed from that neighborhood, and sent to the West Indies to carry out the survey of a harbor there, after which she has been ordered to return to England, about April, 1913. The Newfoundland government is making representations to the British government, in the hope that the work hitherto done by the Ellinor be continued.

At a recent meeting of the Halifax board of trade, a communication was received from a steel shipbuilding concern in England, making a proposal for the establishment

of a steel shiphuilding plant in Halifax. Although the name of the firm concerned was not mentioned in the reports, it is said that it is Armstrong, Whitworth and Co., of Elswick, and Manchester, with which firm St. Percy Girouard, who has recently been visiting in Canada, in connection with a proposed shiphuilding plant, is connected.

The owners of the s.s. St. Pierre Miquelon, a French vessel, owned in St. Pierre, Miquelon, and formerly engaged in the mail service hetween the island and Canada, appealed to the Supreme Court, Oct. 16, against the judgment of the Nova Scotia courts, by which they were held responsihle for the loss of the s.s. Renwick, which was sunk and lost off Egg island, near Halifax, Dec. 26, 1911. The judgment of the lower courts was upheld, and the St. Pierre Miquelon held solely responsihle for the collision and suhsequent loss.

The Boston and Yarmouth Steamship Co., which was recently incorporated to take over the Dominion Atlantic Ry. steamships, will enlarge the herthing capacity of the steamships Prince Arthur and Prince George, and will probably put into service next year the steamship Old Colony. A. E. Williams, heretofore agent, Dominion Atlantic Ry., Yarmouth, N.S., will continue to act as agent for the steamship company, and it is reported that J. Bent will be appointed wharfinger there, replacing J. B. Killam. The steamships Prince Arthur and Prince George have been transferred from the British to the Canadian register.

Plans and specifications for the new wharf at Carleton, N.B., for the Marine Department were recently completed, and tenders were to he received Nov. 1 for the carrying out of the work. The harhor face of the wharf is to he 445 ft. from Middle street, and there will he four crihs, one heing 199 ft. long, and outside of this there will he an angle crih 74½ ft. on either leg, carrying the wharf to the harbor line and forming a little more than half the face. The other half will be an angle crib, 68 ft. long on either leg, making the wharf face a total length of 143 ft. The fourth crih forming the southern anchorage will be 100 ft. long.

The Dominion Coal Co. is reported to have decided to carry out considerable improvements in connection with its coaling plant at Halifax. The present sheds there are to he cleared away, and the latest appliances for handling coal to and from vessels are to be installed. Three towers are to be erected, of wood and steel, running on rails along the wharf, and each tower will be 90 ft. high and have a 65 ft. boom attached with a clam bucket arrangement with capacity of at least one ton of coal. With these towers working, it is estimated that 200 tons of coal can be taken from a vessel each hour, and 1,500 tons hunkered in 10 hours.

Province of Quebec Marine.

The Department of Naval Service recently received tenders for the erection of a wireless telegraph mast at Father point.

The chief of the Quehec fire brigade has recommended the purchase of a steamhoat, equipped with fire fighting appliances, for use in the harbor and along the water front.

The Montreal Transportation Co.'s steamboat Windsor hroke one of her wheels, and collided with a stone pier in the Lachine canal, while on the way to Montreal, Oct. 12.

The Montreal Harhor Commissioners recently offered for sale, the wreck of the steamboat Florida, which was burnt to the water's edge at Victoria pier, and ahandoned, July 7.

Press reports from Quebec state that W. Price and J. B. E. Letellier of Quehec, and A. Gravel of Levis, have been appointed as the new Harbor Commission for Quebec, with the first named as chairman.

An order in council has been passed granting permission to re-register the s.s. Turret Bell, No. 104263, at the port of Quehec, all requirements having been complied with, and also changing its name to Kwasind.

The Quehec Harhor Commissioners received tenders, Oct. 21, for the construction of a 1,000,000 bush. capacity grain elevator with marine tower and shipping apparatus, on the Princess Louise embankment.

Traffic on the Lachine canal, which was interrupted, Sept. 24, hy the carrying away of the gates of St. Gahriel lock, by the Canadian Lake Line steamhoat Nevada, was resumed Sept. 26, on the completion of the work of replacing them.

It is announced that work will shortly be commenced on the enlargement of the G.T.R. elevator at Windmill point, Montreal harbor, by the addition of storage hins for a further 700,000 hush., giving it a total capacity of 1,700,000 bush.

A. Johnston, Deputy Minister of Marine, on his return from an inspection trip around the Magdalen islands, Anticosti, St. Pauls, and the north shore of the St. Lawrence, recently, is stated to have recommended a more modern light than is at present heing used for buoys, range lights, etc.

The act creating a new harhor commission for Quehec, to consist of three members, displacing the former board of nine, came into effect, Oct. 13, by proclamation. The new board, according to local press reports, will consist of W. Price, chairman, J. B. E. Letellier and A. Gravel.

The Public Works Department, during Novemher, will receive tenders for the construction of an extension to the wharves at Ste. Anne de la Pocateriex and Cap a l'Aigle; for extension to the pier at Kamouraska; for a wharf at Ste. Victoire, and for wharves and dregding at Rimouski, Que.

An Ottawa report of Oct. 12 states that as a result of the recent visit of cabinet ministers to Quehec the Government will undertake the construction of a dry dock there as an ordinary public work. It is said that if it is so undertaken, arrangements will he made with the shipping interests for its operation.

G. W. Stephens, Chairman, Montreal Harhor Commission, in an interview, is reported to have stated that he had nothing to say for publication on the suhject. The resignation of the other two memhers of the commission, L. E. Geoffrion and C. C. Ballantyne, had previously been announced by the Minister of Marine.

The floating dry dock, Duke of Connaught, for the Canadian Vickers, Ltd., plant at Montreal, which arrived at Sydney, Oct. 22, and which was towed across the Atlantic by the two Dutch tugs Zwartee Zee and Roode Zee, was insured for the passage for £200,000. A complete description of the dry dock was given in Canadian Railway and Marine world for October.

A proposal to huild a marine railway at Sorel, has heen promised favorahle consideration hy the Minister of Puhlic Works. In connection with the scheme, Sir Rodolphe Forget, President, Richelieu and Ontario Navigation Co., stated at Sorel, Oct. 2, that if the government would carry out the work, his company would pay the interest on the capital cost.

Canada Cement Transport, Ltd., has been incorporated under the Dominion Companies Act, with $50,000 capital, and office in Montreal, to own and operate vessels, and carry on a general navigation and forwarding business. The incorporators are, W. J. Shaughnessy, C. G. Heward, A. Charters, Montreal; A. E. Woodworth and A. B. Wright, St. Lambert, Que.

The Shipping Federation of Canada, the Montreal hoard of trade and the chamber of commerce, are considering the question of arranging a meeting of representatives of the three hodies, with a view to making representations to the government, so that they may recommend a practical representative of the marine interests for the Harhor Commission, two members of which are retiring shortly. The two retiring members are L. E. Geoffrion and C. C. Ballantyne.

The number of permits for the passage of vessels through the Lachine canal, from the commencement of navigation this year to the end of Septemher, was 4,665, against 4,319 for the same period 1911. The merchandise passing through, during September, included, wheat, 3,100,158 bush.; oats, 1,380,827 hush.; flour, 125,529 barrels; eggs, 2,066 cases; hutter, 827 packages; cheese, 37,758 boxes, apples, 6,734 barrels. Increases over the figures for Sept., 1911, were shown in each case, that for wheat being approximately 50%.

Henri Menier, of Paris, France, who owns Anticosti island, in the Gulf of St. Lawrence, and who is carrying on extensive lumhering and fishing operations, is operating one steamship, Savoy, which he owns, and has three other steamships on time charter, viz.,—Norhilda, Querida and Thyra Menier. Four more steamships are to he chartered for next year. Shipments of pulpwood have also heen made on a number of other vessels, including the Saskatoon, Renvoyle and Mapleton, the destinations having been lake ports as for Niagara Falls, N.Y., and on the Atlantic coast to Portland.

Ontario and the Great Lakes.

H. B. Smith, of Owen Sound, Ont., is reported to have heen elected a director of the Richelieu & Ontario Navigation Co.

The Peoples Line steamboat Frontier, formerly Argyle, has heen attached, at Toronto, for unpaid wages. The crew claim that their wages have heen unpaid for two months.

Orders in council have heen passed changing the names of the steamhoats Active, and Marina, to Charlie Gale, and George A. Graham, respectively. The port of registry of the former is Amherstberg, and of the latter, Port Arthur.

Hon. F. Cochrane, Minister of Railways and Canals, inspected the proposed route of the new Welland canal, early in Octoher, and is reported to have stated that as the plans had heen passed, tenders would he called for very shortly.

The Great Lakes Dredging Co. is reported to have placed an order at Port Arthur, for the construction of a large ice hreaking steam tug, ahout 20 ft. longer than the James Whalen, with a cement hull and powerful engines.

The steamhoat Britannic, which went ashore at Weavers point, just below Morrishurg, Aug. 24, was released, Oct. 9, and taken to Prescott. She will prohably he taken to Kingston later, for repairs. She is owned hy H. McMorran, Port Huron, Mich.

The Dominion Public Works Department has awarded the contract for the dredging of about 95,000 cuhic yards at Port Arthur and in the vicinity, to the Great Lakes Dredging Co. A considerahle portion of the dredging will take place in the neighborhood of the dry dock.

The Ontario and Quebec Navigation Co.'s steamboat Lloyd S. Porter, with a barge in tow, went ashore on Morgans point, about six miles west of Port Colborne, Oct. 13. The steamboat was released without damage, but the barge could not be removed, and she subsequently went to pieces.

The C.P.R. terminal elevator B, at Fort William, has been turned over to the Grain Growers' Association, who are now operating it, with the old staff. The elevator has a capacity of 2,500,000 bush. The Grain Growers' Association is expecting to secure control of other terminal elevators in the near future.

An Ottawa press dispatch of Oct. 14, states that it has been decided to have the steamboat Dollard, which is under construction for the St. Lawrence lighthouse service, at Kingston, Ont., equipped with an oil fuel burning apparatus. This will be the first vessel in the government service to be so equipped.

S. Brisbane, who has been chief engineer on vessels of the Northern Navigation Co., for several years, and since the construction of the Hamonic, in charge as chief engineer on her, has been appointed shore engineer, and will spend most of the winter at Port Arthur overlooking the building of the company's new vessel there.

The U. S. steamboat Wm. C. Moreland, which sank in Lake Erie in 1910, and which was salved and taken to Sarnia, was recently towed to Windsor, where, after the stoppage of the pumps, she again sank. It is said that she will be permitted to lie where she is until a purchaser can be found for her engines, which are stated to be in good condition.

The Detroit and Cleveland Navigation Co. has signed a lease of the docks at Port Stanley, for one year, and it is stated that on the reopening of navigation in the spring, a daily steamboat service will be put on from Port Stanley. A clause has been inserted in the lease, providing for the purchase of the docks at the end of the year, under certain conditions.

A Fort William press dispatch states that as a result of a recent visit of Sir Rodolphe, President, and James Playfair, director, Richelieu and Ontario Navigation Co., to Fort William, it is likely that some developments will take place in local marine circles. It is stated that some land has been secured along the Kaministikwia river, which it is thought will be utilized for the company's purposes.

The channel between Wood Island and Wallace island, in the St. Lawrence river, has recently been improved by cutting off the north extreme of the islet and shoal north of Wallace island, and the south extremity of the shoal extending south from Wood island, including the most southerly rock. The channel can safely be used by upbound vessels provided they keep in mid channel, but down bound vessels should use the U.S. channel.

The U. S. Lake Survey reports the levels of the great lakes in feet above tidewater, for September, as follows:—Superior, 602.53; Michigan and Huron, 580.67; Erie, 572.48; Ontario, 246.38. As compared with the average September levels for the past ten years, Superior was 0.27 ft. below; Michigan and Huron, 0.19 ft. below; Erie, 0.70 ft. above, and Ontario, 0.36 ft. above. It was anticipated that during October Superior would remain stationary, while the other levels would fall 0.2 ft.

The Northern Navigation Co. intends making some considerable additions to its facilities at Point Edward, including the erection of a combined storehouse and cold storage plant, built of wood with concrete foundation. The building will be 90 by 60 ft. A laundry building of reinforced concrete to replace the present building at Sault Ste. Marie will also be erected, and the extension of the westbound dock and warehouse to double its present capacity will also be undertaken. The cost is estimated at $50,000.

The U. S. War Department received tenders, Oct. 31, for work on the St. Marys Falls canal, comprising the removal of timber work and all soft and broken rock along about 520 ft., on the south side of the canal, from near the east side of Magazine street, westward to the present concrete wall, and the building of a concrete wall on top or the rock. The estimated quantities cover 4,000 cub. yds. of excavation, 3,700 cub. yds. of concrete, exclusive of cement, 2,500 lin. ft. of drilling and grouting, 1,400 cub. yds. of backfilling, and about 4,400 barrels of cement.

The Toronto Ferry Co.'s ferry steamboat Kathleen was practically destroyed by fire, while in dry dock at Toronto, Oct. 12. The damage is estimated at $7,000, which is covered by insurance. L. Solman, Manager, is reported to have stated that it is highly improbable that she will be rebuilt. She was built at Toronto in 1886, and was the last of the vessels which the Toronto Ferry Co. took over from A. G. Tymon. She was screw driven by engine of 35 n.h.p. Her dimensions were, length 84 ft., breadth 18 ft.; depth 5.5 ft., tonnage 110 gross, 72 register.

The buoys marking the east side of the deeper, or west, channel have been moved to the eastward of the Ballard reef channel in the Detroit river, to give a greater width to the channel. The two northerly gas buoys and the two intermediate spar buoys are moved to mark a line 50 ft. east of the former positions, and the south gas buoy is moved 150 ft. east of its former position. The width of the deep west channel is 350 ft. abreast of the area under improvement at its north end and 450 ft. at the south end abreast of the entrance to the Livingstone channel.

A considerable amount of dredging has been carried out in Fort William harbor during the present year. Since the opening of navigation, seven large dredges and three clam-shells have been working continuously, and it is estimated that between 30,000 and 40,000 cubic yards of solid earth have been dredged each day, in the deepening and widening of the channels. The McKellar river has been dredged its whole length and widened from 95 ft. to about 400 ft., and deepened to 25 ft. The Mission river has been widened from 300 ft. to 500 ft. throughout its length, and deepened to 30 ft. The Kaministikwia river has been widened by 100 ft. from the Mission turning basin to Thunder bay, and is now 500 ft. wide, with an average depth of 30 ft.

Manitoba, Saskatchewan and Alberta.

The steamboat Mount Cashel, owned by E. A. Moore, Winnipeg, was badly damaged by fire on the Red river, near the Main street bridge, Oct. 12. The whole of her upper portion was burned, the damage being estimated at $20,000, which is covered by insurance. She was built this year for pleasure service on the river and lake and had 78 staterooms. Her cost is said to have been about $180,000.

The Hyland Navigation and Trading Co.'s steamboat Winnitoba, was destroyed by fire, at Winnipeg, Sept. 29. She was built at St. Boniface in 1909, and was paddle wheel driven with engine of 21 n.h.p. Her dimensions were, length 170 ft., breadth 28.5 ft., depth 7 ft.; tonnage, 883 gross, 556 register. J. L. Hyland, President, is reported to have stated, Oct. 3, that nothing definite had been settled about building another vessel to replace her, but it was probable that one would be built, to be ready for service about next June.

A Winnipeg press report states that a proposition is under consideration to connect Portage la Prairie with Lake Winnipeg, and says that at a comparatively small outlay, the town could be connected by waterways with the North Saskatchewan river. A 2½ mile channel through Meadow portage would connect Lakes Manitoba and Winnipegosis, and the deepening of a similar channel, which has during high water periods been navigated by Hudson's Bay Co.'s vessels, would connect Lake Winnipegosis with Cedar lake, which is an extension of the North Saskatchewan river, above Grand Rapids. A canal from Delta to Portage creek would complete steamboat navigation to Edmonton.

British Columbia and Pacific Coast Marine.

The G.T. Pacific Coast Steamships Co.'s s.s. Prince George will be withdrawn from the service between Victoria, Prince Rupert and Stewart, Nov 1, and placed in the dry dock at Esquimalt for general overhauling and repairs. On the completion of these, she will take the place of the s.s. Prince Rupert, which will be similarly overhauled.

The city of New Westminster is applying to the Dominion parliament for an act providing for the future management of the port of New Westminster, the tidal waters of the Fraser river, and all the water front property along them and adjacent waters, and to constitute the New Westminster Harbor Commission.

The Coquitlam Shipbuilding and Marine Railway Co., recently incorporated with $500,000 capital and office at Vancouver, B. C., is reported to have begun the erection of buildings near the junction of the Pitt and Fraser rivers, at Coquitlam, where a general shipbuilding business will be engaged in when the plant is completed. L. D. Shaffner, Bridgeton, N.S., is chiefly interested in the project.

The municipalities of Richmond, South Vancouver, Burnaby and Point Grey are applying to the Dominion parliament for an act constituting the waters of the north arm of the Fraser river, lying west of the westerly limits of New Westminster, together with all the branches and arms, to lines drawn across the points of land forming the mouths of the outlets of the north arm, and branches emptying into the Gulf of Georgia, with the waters of the Gulf of Georgia, adjacent thereto and known as Sturgeon bank, as a harbor under the name of North Fraser harbor, to provide for the management of the harbor, the appointment of the North Fraser Harbor Commission and defining its powers.

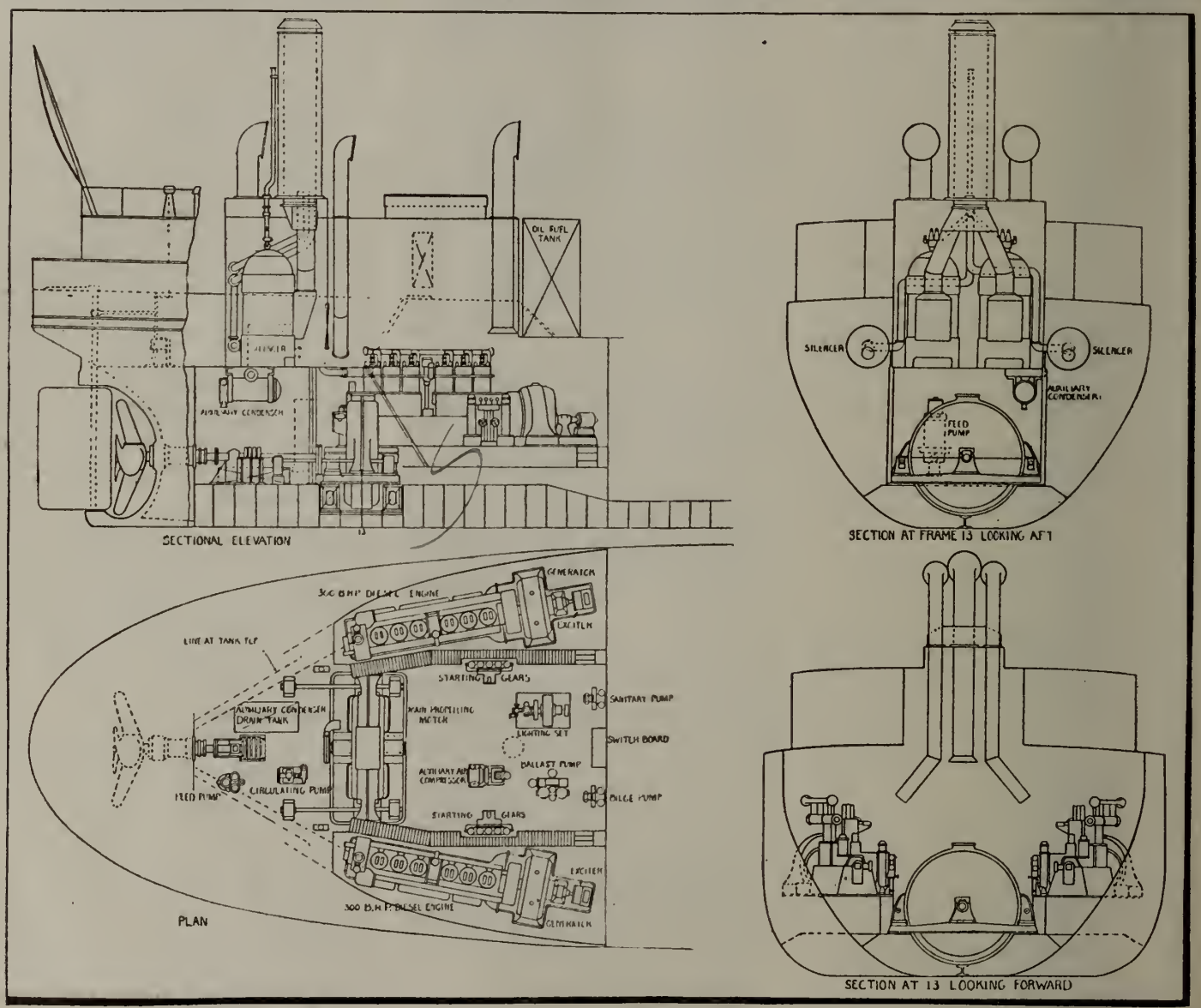
Largest Freighters in the World.—The largest vessels in the world designed for carrying freight exclusively are the Col. James M. Schoonmaker and the William T. Snyder, Jr., built for operation on the Great Lakes. They measure over all 617 ft., molded beam 64 ft., molded depth 33 ft., with a deadweight carrying capacity at 20 ft. draught of 13,200 tons. They carry water ballast in side tanks and in a double bottom which is 6 ft. deep. The total water ballast capacity is 9,440 tons. Each vessel is equipped with a quadruple expansion engine of vertical inverted type with an estimated horse power at 90 revolutions per minute of 2,600.

An Electrically Propelled Vessel for the Canadian Lakes Trade.

Canadian Railway and Marine World for September, contained some details of the vessel, which is to be electrically driven, and which is under construction at Newcastle, Eng., for the Montreal Transportation Co. The following additional details will be of interest:—

The engine, which is of the Diesel four cycle principle, has six cylinders 12 in. diar., and a stroke of 13½ ins., giving 400 revolutions a minute. The cylinders cranks are so arranged that the firing occurs at equal intervals. The engine is entirely enclosed, and the forced lubrication is arranged for by a valveless pump driven from an eccentric on the crank shaft at the compressor end. The second motion shaft is driven by a worm wheel on the crank shaft midway between the centre cylinder through a vertical shaft, which carries the governor at the upper end. This second motion shaft, which is at the front of the engine, and carries the cams for working the valves, also carries the eccentrics driving the two fuel pumps. This enables the power to be evenly divided between the cylinders. The compressor is driven from the main crank shaft, and is mounted on the bed plate extended for the purpose. The engine is started by compressed air stored in receivers placed near the engine, supplied by the compressor on the engine, which also supplies the compressed air for forcing the fuel oil into the cylinders. A patent arrangement for the prevention of the accumulation of fuel oil in the valves is provided. A small fly wheel is used, sufficiently heavy to ensure steady running, etc. Cooling water is circulated through the cylinder and compressor jackets by a rotary pump drawing directly from the sea, and is driven by mitres geared from the compressor end of the crank shaft. The air for the main cylinders is taken through the bed plate. Under normal operation the engines will run under governor control at 400 r.p.m, but the speed can be adjusted by the governor so that it may maintain a rate considerably below this if required.

The electric equipment consists of two three-phrase generators giving 235 kilovolt-amperes at 500 volts alternating, each. They have six and eight poles respectively, giving frequencies of 20 and 26.6 per second. An exciter is connected to the shaft of each generator, which when working normally gives about 30 amperes at 100 volts, and is arranged for a considerable overload. Coupled direct to the propellor shaft is a single three phase motor, developing 500 shaft h.p. The motor is of the simple squirrel cage type without any mechanical or electrical connections, apart from its attachment to the propellor shaft. The stationary part of the motor has two separate windings for 30 and 40 poles respectively, which are mutually non-inductive, thus exercising no influence on one another, and they work independently on the magnetic circuit of the motor. When these windings are connected respectively to the appropriate generator, the synchronous speed due to each is 80 r.p.m. when at full speed. By changing the connections the rotation is reversed, and by connecting the 40 pole winding to the 6 pole generator, the synchronous speed drops to 60 r.p.m., thus giving about three-quarters speed. One generator may be stopped and the other left running at full speed under governor control, giving approximately its full economy, as the power required to drive at three-quarters speed is about half what is required to drive at full speed. If either of the generators be left attached to its own winding, the other being shut down intentionally or by accident, the vessel is propelled by either engine at a little over half speed, the speed of the vessel dropping with the rotation of the engine until an automatic adjustment of power and speed is reached, which occurs at about half speed. The control gear, which will not be operated from the bridge as a regular thing, but which is being so arranged that such opera-



Arrangement of Machinery in Diesel-Engined Ship with Electric Drive for the Montreal Transportation Co.

tion can be carried out when desired, has five positions on the switch, similar to those of the ordinary engine room telegraph, each position being definitely fixed by cams and rollers so that a stoppage at an intermediate position is prevented. For half speed, no. 1 generator is coupled up to no. 2 winding of the motor, and no. 2 generator is running light or stopped; for full speed each generator is connected to its own winding in the motor. The controlling gear provides for the interruption of the excitation of the generators while the switch is being moved from one step to another. This method of operation renders the electric circuits dead while the switching over operation is being carried out and injurious sparking is avoided.

Two steam boilers are provided for operating the deck equipment, steering gear, electric lighting and heating. Fuel oil is used for the boilers. It is estimated that the vessel will carry about 250 tons more than a similar vessel equipped with reciprocating engines, and she is designed to carry 2,400 tons deadweight of cargo, fuel, fresh water and stores on a 14 ft. draught.

Her dimensions are, length between perpendiculars 250 ft., length over all 256 ft., breadth extreme 42½ ft., depth moulded 19 ft., forecastle 48 ft., poop deck 42 ft., speed 9 knots an hour.

The foregoing is adapted from the Marine Review.

Navigation Matters on the Yukon River

O. L. Dickeson, President White Pass and Yukon Route, has announced that the company will extend its Yukon river steamboat service next year to Fairbanks, Alaska, about 800 miles northwest of Dawson.

A Pacific Coast correspondent writes us that the additional service may be provided by putting in operation some more boats, which are idle at White Horse, Yukon. This, however, being contingent upon the U.S. Government opening Fairbanks as a subport of entry for these vessels. If this is not conceded, it is expected the company will build two more boats at Seattle, Wash., which will be shipped to White Horse in sections and put together there.

In the early rush to the Klondike, before the White Pass and Yukon route was entirely completed, there were a large number of people rushing into Dawson seeking gold, and it looked as though navigation would be closed, due to weather conditions, before a sufficient amount of supplies could be handled into Dawson to take care of the population. Hence the Canadian Government issued an order permitting United States bottoms to handle goods into Dawson as a free subport of entry. The necessity, however, for issuing this order, as it turned out, never existed, nor does it exist to-day, although no action was taken to have the Government rescind the order to protect British capital against the invasion of U.S. capital in British territory. This has given the U.S. company such a decided advantage over the British company that the British Yukon Navigation Co., Ltd., made application to the U.S. Government to be accorded a similar courtesy in the opening of Fairbanks as a subport of entry and thus enable it to establish a competing service, which is very badly needed all through the lower Yukon river country.

No decision has yet been given at Washington, but it is stated that the Collector of Customs for Alaska has reported adversely on the matter to the Secretary of the Treasury. The Fairbanks Commercial Association has petitioned the President of the U.S. to take favorable action in the matter, owing to the fact, according to petition, that the people who control the transportation facilities likewise control a large part of the merchandising business, thus making it very important for the protection of independent merchants to have another transportation company. Should the President refuse the request it will be most unjust discrimination, for as above pointed out the U.S. has enjoyed a similar courtesy at the hands of the Canadian Government for a number of years and it will most certainly be the Dominion Government's duty to withdraw the privileges under which United States steamboats can go to Dawson.

Canadian Notices to Mariners.

The Department of Marine has issued the following:—

79. Sept. 18. 216. Nova Scotia, Bay of Fundy, Lurcher shoal lightship, intended change in characteristic of fog alarm. 217. New Brunswick, east coast, North Tracadie gully, buoy established. 218. Quebec, Gulf of St. Lawrence, Harrington islands, Harrington harbor, changes in buoyage. 219. Quebec, River St. Lawrence, Saguenay river entrance, Bar reef, bell buoy established.

80. Sept. 19. 220. British Columbia, Burrard inlet, Vancouver harbor, Burnaby shoal, light and fog bell established on a float, caution. 221. British Columbia, Observatory inlet, Granby bay, Graves point, light established.

81. Sept. 23. 222. Ontario, Georgian bay, Victoria harbor, Port McNicoll, buoyage. 223. Ontario, Georgian bay, Byng inlet, buoys established. 224. Ontario, Lake Nipissing, North Bay, light established on wharf.

82. Sept. 26. 225. Nova Scotia, Cape Breton island, east coast, Sydney harbor, south arm, Sydney, Battery point range lights established. 226. Quebec, River St. Lawrence, St. Thomas channel, change in color of starboard gas buoy lights. 227. Newfoundland, east coast, Conception bay, Western bay head, change in character of light.

83. Sept. 27. 228. Ontario, Lake Erie, Port Colborne, light exhibited on eastern breakwater. 229. Ontario, Lake Superior, Thunder cape fog alarm, direction in which horn points. 230. Ontario, Lake Superior, Thunder bay, Fort William, off mouth of Kaministikwia river, gas buoy replaced by gas and bell buoy. 231. Ontario, Lake Superior, Thunder bay, Mutton island, Burke shoal, buoys established.

85. Oct. 1. 234. Ontario, River St. Lawrence, Thousand islands, Fiddlers Elbow, shoal being dredged, gas buoy removed, new channel opened. 235. Ontario, Detroit river, Ballard reef channel, increased width of available deep channel, buoys moved. 236. Ontario, Lake Huron, chart issued, Cove island to Duck islands. 237. Ontario, Lake Huron, chart issued. Duck islands to Detour passage.

86. Oct. 3. 238. Quebec, Gulf of St. Lawrence, Ste. Anne river, Ste. Anne des Monts, light established on pier. 239. Quebec, River St. Lawrence, Orleans island, south shore, St. Francois wharf, light established.

87. Oct. 4. 240. Nova Scotia, Cape Breton island, Cape North light station, fog alarm destroyed by fire.

88. Oct. 7. 241. Quebec, Ottawa river, Ste. Anne de Bellevue, third range light established. 242. Quebec, Ottawa river, Chute a Blondeau, range lights established.

89. Oct. 12. 243. Quebec, Saguenay river, east of river Caribou, Savard range lights discontinued. 224. Quebec, Saguenay river, change in position of river Caribou range lights. 245. Quebec, Saguenay river, Simard range lights established.

90. Oct. 16. 246. Quebec, River St. Lawrence, Ile Verte, range lights established. 247. Newfoundland, south coast, Placentia bay, Tides Cove point, fog signal established. 248. United States of America, Maine, Moose Peak light station, fog signal established. 249. Ireland, east coast, Rosslare harbor approach, South Long bank buoy, replaced by light and bell buoy.

91. Oct. 18. 250. New Brunswick, south coast, Bay of Fundy, Sisters rock, buoy established. 251. New Brunswick, Chignecto channel, Cumberland basin, eastward of Amherst basin, buoy established. 252. Nova Scotia, Bay of Fundy, Lurcher shoal, lightship replaced on her station. 253. Nova Scotia, south coast, Aspotogan peninsula, shoal off Bayswater, buoy established. 254. Prince Edward Island, east coast, Cardigan bay, Georgetown harbor, daymark on Georgetown back range lighthouse. 255. Prince Edward island, south coast, Hillsborough bay, Haszard point, daymarks on range lighthouses. 256. Prince Edward Island, south coast, Hillsborough bay, Charlottetown harbor, daymarks on Brighton beach range lighthouses.

The Canadian Interlake Line's Vessel Fordonian.

This vessel which has been built at Port Glasgow, Scotland, by the Clyde Shipbuilding and Engineering Co., Ltd., has already been partly described in Canadian Railway and Marine World, and is of special interest as the first of her type to be built in Great Britain. She is 250 ft. long, 42½ ft. beam and 26½ ft. deep to awning deck. The special feature is that she has been fitted with oil motors of the Carels-Diesel type. The engines are of the two cycle type, and have a brake horsepower of 750, which is equal to an indicated horsepower in a steam engine of 875.

The trial trip took place Sep. 21. We are advised that from the time of starting off the engines at 8 a.m. they were never stopped, excepting by the orders from the pilot on the bridge, until 9 p.m. Several runs on the Firth show the vessel to have a speed of 10 knots, although only developing considerably under the maximum power. During the whole of the trials the engines worked very satisfactorily and very smoothly. Vibration in the ship was practically nonexistent. Representatives from the British Admiralty, Imperial Japanese Navy, Australian and Canadian steamship owners, and very many of the principal shipping companies in Great Britain and Ireland were present, and to the majority of them the smooth and satisfactory working of the machinery was a revelation. During the course of the trials, the engines were tested for manœuvring purposes, and were put through a very severe test. During 40 minutes, 61 manœuvres were executed, this being a much more severe test than a steam engine is usually subjected to, but the whole performance was carried out with very commendable dispatch, and with great satisfaction. The time occupied in going from full speed ahead to full speed astern was eight seconds.

After the trial trip the vessel returned to Glasgow to load, and after further runs on the measured mile, which were satisfactory in every way, sailed Sep. 28 for Canada. On Oct. 21 it was reported that the vessel had met with an accident in the Irish channel, and had put back for Glasgow.

V. W. Ferneret, Superintending Engineer, St. Lawrence ship canal, has been appointed a member of the Lighthouse Board, in place of Capt. L. A. Demers, recently appointed harbor master at Montreal.

Registration of Terminal Elevator Warehouse Receipts.

Under the provisions of the Canada Grain Act, an order in council has been passed approving of the rules and regulations and fees in connection with the registration of terminal elevator warehouse receipts, as adopted by the Board of Grain Commissioners. These provide that as soon as possible after Aug. 31, in each year, statements of all outstanding warehouse receipts, and of car lots and parcels of grain for which no receipts have been issued, shall be sent to the Deputy Registrar. The warehouseman shall issue to the person entitled to receive it, a warehouse storage receipt for each individual car load or parcel of grain, subject to his order, stating the date of receipt of grain in store, quantity and inspected grade, that grain has been received and stored with grain of the same grade by inspection, that the grade is deliverable on return of receipt properly endorsed by the person to whose order it was issued, and on payment of charges for storage and transportation, if any. Every warehouse receipt, before being delivered to the party entitled to receive it, shall be tendered to the Deputy Registrar by the warehouseman, for registration, and shall be accompanied by a list setting forth the number of each receipt, the date, the ex car number, kind and grade, gross weight, dockage and net weight, and the name of the elevator issuing receipt. No grain shall be shipped from any terminal elevator by the warehouseman, and no grain shall be delivered by the warehouseman unless the covering warehouse storage receipts be surrendered by the shipper to the warehouseman. When any grain is delivered or shipped from a terminal elevator, the operator shall tender to the Deputy Registrar for registration for cancellation, registered warehouse storage receipts covering the same both as to quantity and grade, and showing number of receipt, date out of store, amount, grade and kind of grain. As soon as possible after shipment, in no case, except through unavoidable delay, exceeding three days, the owner, lessee or manager of every terminal elevator shall furnish the Warehouse Deputy Registrar weekly with a correct statement of the amount of each kind and grade of grain received in store in his elevator during the week, also the amount of each kind and grade of grain delivered or shipped. Each terminal elevator shall pay to the Board of Grain Commissioners 4c. per 1,000 bush. for inward registration, and 4c. per 1,000 bush. for registration for cancellation. At the end of each month the Board shall render each terminal elevator an account of such fees, and such account shall be paid before the 10th of the following month.

List of Steam Vessels Registered in Canada during August, 1912

Name.	No.	Where and When Built.	Engines, etc.	Length	Breadth	Depth	Gross Tons	Reg. Tons	Port of Registry	Owners.
Abegweit	131031	Steveston, B.C., 1912	Screw 3 n.h.p.	30.0	9.5	3.1	6	6	Vancouver, B.C.	H. C. Shaw, Vancouver, B.C.
Adine II	130933	Stamford, Conn., 1910	" 4 "	55.6	10.9	6.8	21	14	Montreal	J. K. L. Ross, Montreal.
Alouette	131104	Brockville, Ont., 1912	" 1 "	30.4	6.1	2.5	3	2	"	A. Decary, Montreal.
Alven S	130960	Tancook, N.S., 1912	" 1 "	53.2	14.6	7.6	29	27	Lunenburg, N.S.	Dominion Fisheries Ltd., Halifax, N.S.
B.C.L	130773	Michipicoten, Ont., 1911	" 2 "	44.0	12.0	5.2	18	9	Sault Ste. Marie, Ont.	H. F. Huxtable, Michipicoten, Ont.
B. C. Boy	131032	Port Guichon, B.C., 1912	" 17 "	62.0	17.5	7.2	61	42	Vancouver, B.C.	V. Martinolich and B. Nicolich, Port Guichon, B.C.
Blanchard C	130508	Shelburne, N.S., 1912	" 2 "	41.0	13.0	5.8	11	11	Shelburne, N.S.	A. Swansburg, M.O., Little Harbor, N.S.
Blanche L. G	131070	Blandford, N.S., 1912	" 1 "	41.0	10.6	5.8	12	11	Lunenburg, N.S.	H. Gates, Blandford, N.S.
Blanche S	131080	Little Tancook, N.S., 1907	" 1 "	40.2	10.3	5.8	11	10	"	R. Schnare, M.O., Blandford, N.S.
Bogan	103828	New Richmond, Que., 1909	" 3 "	54.0	13.2	3.2	28	18	Paspebiac, Que.	Montgomery & Sons Co., New Richmond, Que
C.F.T	130498	New Westminster, B.C., 1912	" 6 "	46.0	11.9	5.0	24	15	New Westminster, B.C.	Canadian Fish Products Ltd., London, Eng.
Casarco	130430	Shelburne, N.S., 1912	" 3 "	71.0	16.7	6.5	34	24	St. Andrews, N.B.	Canadian Sardine Co., St. Andrews, N.B.
Clan	130887	Victoria, B.C., 1909	" 1 "	27.5	6.9	2.6	3	3	Victoria, B.C.	R. Allan, Chemainus, B.C.
Conveyor	130885	Tete Jaune Cache, B.C., 1912	" 15 "	141.7	34.8	5.2	725	457	"	J. W. Stewart, Vancouver, B.C.
Deborah	130497	Annieville, B.C., 1912	" 1 "	29.5	8.4	3.0	6	4	New Westminster, B.C.	J. Gundersen, Annieville, B.C.
Denise S	131107	Sorel, Que., 1912	" 17 "	54.6	14.6	6.4	54	26	Montreal	Sincennes-McNaughton Line, Montreal.
De Witt	131069	Lunenburg, N.S., 1908	" 1 "	43.9	11.0	5.5	12	11	Lunenburg, N.S.	F. Mason, Eastern Points, N.S.
Dominion Park No. 1	131108	Sorel, Que., 1910	" ½ "	25.5	5.3	2.5	2	2	Montreal	A. A. Cherrier, Montreal.
Doncella	131034	Tacoma, Wash., 1908	" 5 "	70.8	12.8	3.1	27	18	Vancouver, B.C.	West Vancouver Ferry Co., Vancouver, B.C.
Donna Isabel	131035	Vancouver, B.C., 1912	" 3 "	49.5	11.0	5.0	20	14	"	J. W. Chappell, Vancouver, B.C.
Dowagiac	130891	Victoria, B.C., 1912	" 2 "	31.2	8.5	4.5	10	5	Victoria, B.C.	G. Watson, Victoria, B.C.
Dreadful	131148	South Shields, Eng., 1912	" 74 "	118.5	25.2	13.8	253	92	Vancouver, B.C.	Canadian Tugboat Co., Vancouver, B.C.
Du Sault	131103	Montreal, 1906	" 1 "	34.0	6.5	2.6	3	2	Montreal	A. Dussault, Varennes, Que.
E. E. Lowe	130370	Louisburg, N.S., 1912	" 18 "	42.9	10.0	7.2	16	15	Sydney, N.S.	C. A. Lowe, Sydney, N.S.
Elsie S	131079	Tancook, N.S., 1912	" 1 "	40.0	10.0	5.2	11	10	Lunenburg, N.S.	R. Schnare, Blandford, N.S.
Elsie T	131149	Vancouver, B.C., 1912	" 1 "	30.8	8.0	3.5	6	4	Vancouver, B.C.	J. Taylor, Vancouver, B.C.
G. H. Notter	130935	Grenville, Que., 1912	" 5 "	51.7	14.0	5.5	33	16	Montreal	G. Dansereau, Grenville, Que.
H. Mason	131068	Lunenburg, N.S., 1911	" 1 "	41.0	10.4	5.2	11	10	Lunenburg, N.S.	C. Mason, M.O., Eastern Points, N.S.
Howker	131072	Tancook, N.S., 1912	" ½ "	41.0	11.3	5.9	13	12	" "	A. Gates, M.O., Blandford, N.S.
Iskum	131156	Vancouver, B.C., 1912	" 6 "	68.6	17.4	9.2	62	42	Vancouver, B.C.	Clayoquot Sound Canning Co., Victoria, B.C.
Janet B	130713	Kenora, Ont., 1912	" 5 "	44.0	11.2	4.0	20	13	Kenora, Ont.	J. Boucha, Kenora, Ont.
Joe Goodwin	131084	Toronto, 1912	" 3 "	48.4	14.0	6.0	38	26	Toronto	J. Goodwin, Toronto.
Kimsquit	131145	Mamu, B.C., 1912	" 5 "	43.9	10.2	4.5	15	10	Vancouver, B.C.	Draney Fisheries, Ltd., Vancouver, B.C.
Kwasind	130318	Toronto, 1912	" 8 "	71.0	15.0	5.7	47	32	Toronto	Royal Canadian Yacht Club, Toronto.
Lady Auto	131122	Hull, Que., 1909	" 3 "	50.2	10.1	4.6	17	12	Ottawa	J. and P. Hupe, J.O., Hull, Que.
L'Orignal Bay	130931	L'Orignal, Ont., 1912	" 4 "	54.2	13.5	5.1	33	16	Montreal	E. Cote, L'Orignal, Ont.
Lunenburg	131074	Tancook, N.S., 1905	" 1 "	40.2	10.2	5.0	11	10	Lunenburg, N.S.	G. Baker, Cross Island, N.S.
Makehewi	131150	Pt. Blakeley, Wash., 1910.	" 2 "	35.1	11.2	4.0	14	9	Vancouver, B.C.	W. Sulley, Jr., Vancouver, B.C.
Margaret F	130972	Collingwood, Ont. 1912	" 6 "	56.2	11.5	5.0	31	19	Collingwood, Ont.	J. F. Monck, Hamilton, Ont.
Margaret M.Gray	130592	Mahone Bay, N.S., 1912	" 1 "	54.2	13.4	8.5	25	23	Halifax, N.S.	A. Gray, et al., Pennant, N.S.
Mary Maude	131071	West Dover, N.S., 1912	" 1 "	40.2	10.0	5.5	11	10	Lunenburg, N.S.	G. Johnson, West Dover, N.S.
Mink	131085	Gravenhurst, Ont., 1912	" 11 "	78.0	14.5	4.9	89	60	Toronto	W. Hanna, et al., J.O., Port Carling, Ont.
Moon Light	131037	Vancouver, B.C., 1912	" 11 "	60.6	17.4	7.9	63	43	Vancouver, B.C.	T. G. McBride, et al., Vancouver, B.C.
Myfanwy	130890	Tacoma, Wash., 1911	" 1 "	35.2	9.3	3.6	10	5	Victoria, B.C.	A. W. Bridgman, Victoria, B.C.
Nelmar	130888	Seattle, Wash., 1911	" ½ "	27.4	7.4	3.6	5	3	"	L. L. Adamson, Sidney, B.C.
Ohamel	131151	Ruby Creek, B.C., 1912	" 1 "	30.0	7.0	3.0	5	3	Vancouver, B.C.	A. Forrest, Ruby Creek, B.C.
Operator	130886	Tete Jaune Cache, B.C., 1912	" 15 "	141.7	34.8	5.2	698	439	Victoria, B.C.	J. W. Stewart, Vancouver, B.C.
Ouananiche	130929	Lachine, Que., 1912	" 2 "	36.5	9.7	4.6	12	8	Montreal	D. W. Ross, Jr., Westmount, Que.
Paipoonge	130840	Cleveland, O., 1888	" 186 "	292.0	40.8	21.0	2517	1635	Port Arthur, Ont.	J. Whalen, Port Arthur, Ont.
Plunger	131152	Vancouver, B.C., 1912	" 11 "	55.7	17.0	7.8	57	38	Vancouver, B.C.	B. T. Brynelson, Vancouver, B.C.
Port Moody	131146	" " 1911	" 2 "	34.0	8.6	3.2	11	7	" " "	A. M. Leitch and G. Taylor, Vancouver, B.C.
Prince Arthur	110131	Hull, Eng., 1898	" 716 "	290.5	38.0	16.5	2041	700	Yarmouth, N.S.	Boston and Yarmouth Steamship Co., Montreal.
Prince George	110003	" " "	" 716 "	290.5	38.0	16.5	2040	714	" " "	" " "
Pronative	131153	Vancouver, B.C., 1912	" 16 "	57.3	17.0	7.5	55	37	Vancouver, B.C.	Progressive Steamboat Co., Vancouver, B.C.
Reliance C	130650	Elk Lake, Ont., 1911	" 5 "	47.8	10.2	4.0	19	16	Ottawa	J. Laishley, Toronto, and W. Kervin, Callander, Ont., J.O.
Robt. R. Rhodes	131109	Cleveland, O., 1887	" 80 "	246.3	40.0	18.6	1599	957	Montreal	F. E. Hall, Montreal.
Robinette	131154	Vancouver, B.C., 1912	" 2 "	33.1	8.1	3.9	9	6	Vancouver, B.C.	H. Williamson, Vancouver, B.C.
Roseway	130509	Shelburne, N.S., 1912	" 2 "	71.8	17.7	8.1	42	37	Shelburne, N.S.	Roseway Fish Co., Shelburne, N.S.
St. Charles Lachenaie	131105	Montreal, 1911	" 2 "	35.5	6.9	3.0	4	4	Montreal	Z. Therrien, Lachenaie, Que.
Saint Elme	131106	Lachine, Que., 1905	" ½ "	28.1	5.5	2.5	2	2	"	" " "
Shibley	130762	Picton, Ont., 1912	" 2 "	40.2	10.0	4.4	12	11	Kingston, Ont.	J. Shibley, Battle, Ont.
Stephen C. Hall	130432	Grand Haven, Mich, 1880	" 374 "	161.0	30.0	10.0	511	307	Sarnia, Ont.	G. Horn, Wolfe Island, and G. Y. Chown, Kingston, Ont.
Thomas Crosby	131147	Vancouver, B.C., 1912	" 20 "	83.4	18.5	9.0	116	79	Vancouver, B.C.	J. H. White, Sardis, B.C.
Trader S	126656	Midland, Ont., 1912	" 16 "	71.1	15.2	6.0	96	66	Midland, Ont.	Playfair Preston Co., Midland, Ont.
Wabasso	131155	Vancouver, B.C., 1912	" 1 "	33.9	8.1	3.9	8	6	Vancouver, B.C.	R. J. McLaren, Vancouver, B.C.
Waldren W	130961	Grand Entry, Que., 1912	" 20 "	42.5	13.2	4.6	14	11	Magdalen Islands, Que.	W. Rankin, et al., Magdalen Islands, Que.
Willard	130761	Rideau Ferry, Ont., 1912	" 1 "	44.4	9.0	3.5	27	18	Kingston, Ont.	M. A. Code, Smiths Falls, Ont.

The Canada-Australia Mail Line s. s. Niagara.

Following is a condensed description of the s.s. Niagara, built for the Union Steamship Co., of New Zealand, for the mail route between Canada and Australasia, and which was recently launched at Glasgow, Scotland, by the Dominion Premier's wife, Mrs. Borden.

Length over all, 543 ft.; breadth, moulded, 66 ft.; depth to upper deck, 37½ ft.; depth to boat deck, 64 ft.; gross tonnage, 13,000 tons. Though chiefly designed for passengers, a considerable space will be devoted to cargo, which will be handled to and from the holds by hydraulic hoists, a large part of the hold space being insulated for the carrying of frozen meat, fruit and other perishable commodities. Accommodation will be provided for 281 first class passengers on the main, upper, shelter and promenade decks, amidships, where state rooms are arranged for from one to four passengers, and also in suites. The dining saloon will have accommodation for 190 passengers, arranged in small parties. A large lounge will be placed on the promenade deck, and there will be an electric elevator between the main and promenade decks. The second class accommodation will be for 210 passengers, and will be placed aft, with the dining room on the upper deck, and music and smoke rooms above. Third class passenger accommodation for 176 will be placed forward. Special care has been taken to adopt the best means for heating and ventilating the vessel, having regard to the varying climates she will pass through on her voyage between Australia and Canada. The thermo-tank system has been adopted which will insure an even temperature throughout the trip. These tanks are designed to change the air in any of the compartments to which they are connected, ten times an hour, and will supply a continuous supply of fresh air to all the living quarters in the vessel, which can also be heated to any temperature. The installation will consist of 19 thermo tanks. The lifeboat accommodation will be more than sufficient to provide for all the passengers and crew, and will be equipped with the latest improved davits, chocks and disengaging gear. A wireless telegraph installation and the latest fire extinguishing appliances will also be included in the equipment.

The machinery will comprise a combination of reciprocating engines and low pressure turbines. Steam will be supplied by ten cylindrical boilers, each fitted with four furnaces and forced draught. The working steam pressure will be 220 lbs. The furnaces will be so arranged that either oil or coal may be used as fuel, the intention being to use oil, and there will be sufficient capacity to carry oil for the return trip, and also for a supply of coal should it be found necessary to use it. A complete electric lighting plant will be supplemented by an emergency plant placed on the boat deck, so that in case of accident, light may always be maintained.

Electric Propulsion for Ships.

Electric ship propulsion will shortly receive its first trial, for a naval fuel ship, Jupiter, equipped for such driving, was launched recently at the U.S. navy yard at Mare island. The new system is being given a good trial, for this ship is 572 ft. long, 65 ft. beam, draws 27½ ft. loaded and will carry 12,500 tons of coal and 375,000 gal. of fuel oil. Her object, aside from her duty as a fuel carrier, is to demonstrate that economies in fuel consumption on turbine ships can be obtained by using turbo generators furnishing current to motors on the propellor shafts, instead of connecting the turbines directly to the shafts. In the latter combination the efficient speed of the turbine and of the propeller are not the same, and a compromise has been made by raising the propeller speed and decreasing that of the turbine. The propeller is not so efficient as at lower speed, and the weight of the turbines has been greatly increased. By using an electric drive the turbine can be kept down to the dimensions and up to the speed of stationary practice; by using two motors on each shaft all the requirements for propeller efficiency at any speed, ahead or astern, can be readily met. The design of the motors for the Jupiter is not known in detail, but those interested in the general subject will find an important discussion of it in a paper by Mr. Emmet before the American Institute of Electrical Engineers in February, 1911, in which he explained the details of a design developed by the General Electric Co. for a battleship. According to his figures the total efficiency in pounds of steam per horsepower on the shaft would be substantially constant at speeds ranging from 12 to 21 knots, and far better than ordinary turbine propulsion could show. The total weight of the mechanical equipment of the ship was not lowered by this system of propulsion. The trials of the new ship will be awaited with interest, because the trials of the alternative method of reducing speed between the turbine and the propeller, involving enormous gears, were not wholly successful owing to defective parts in the machinery, something particularly serious in such mechanism. It is doubtless true that the gear transmission will save a great deal of weight in comparison with the electric system, but if the claims made for the efficiency of the latter are borne out in the Jupiter's trials its advocates will be able to make some decidedly pretty arguments when the respective merits of the two systems come up for discussion again.—Engineering Record.

Vessels Removed From the Register.

The following vessels were removed from the register, during August, for the reasons assigned:—Steam—Edna, Vancouver, B.C., 12 tons, dismantled; Hazelton, Victoria, B. C., 236 tons, dismantled; Lara, New Westminster, B.C., 5 tons, dismantled; Rockland, Ottawa, Ont., 50 tons, dismantled; Sea Wolf, Vancouver, B.C., 20. tons, burned. Sailing—Annie Smith, Paspebiac, Que., 249 tons, abandoned; Arclight, Charlottetown, P.E.I., 103 tons, sunk; Dorothy Louise, Shelburne, N.S., 125 tons, missing; Energy, Lunenburg, N.S., 97 tons, stranded; Eva Stewart, Parrsboro, N.S., 98 tons, broken up; Jessie D., Parrsboro, N.S., 8 tons, broken up; Kalevala, Sydney, N.S., 10 tons, wrecked; Laura, Liverpool, N.S., 299 tons, transferred to Barbadoes; Lion, Magdalen Islands, Que., 42 tons, broken up; May Myree, Lunenburg, N.S., 89 tons, stranded; Rosa, Montreal, 140 tons, burned; Seth, Jr., Liverpool, N.S., 199 tons, sold to foreigners, Colon, Panama; Thurston, Parrsboro, N.S., 61 tons, broken up; Trader, Parrsboro, N.S., 73 tons, broken up.

List of Sailing Vessels and Barges Registered in Canada during August, 1912

Name.	No.	Where and When Built.	Rig.	Length	Breadth	Depth	Reg. Tons	Port of Registry.	Owners.
A. Lafleur	130934	Yamaska, Que., 1912	Sloop	102.4	23.1	6.4	106	Montreal	A. Lafleur, Notre Dame de Pierreville, Que.
Alleen Gladys	130591	Ship Harbor, N.S., 1912	Schr.	45.0	13.0	6.0	16	Halifax, N.S.	G. E. Siteman, M.O., Ship Harbor, N.S.
Ashigamik	130889	Seattle, Wash., 1894	"	27.6	11.0	5.3	7	Victoria, B.C.	A. J. Davidge, Victoria, B.C.
Auburn	131181	Peterboro, Ont., 1912	Scow	110.0	27.4	7.1	190	Peterboro, Ont.	Minister of Railways and Canals, Ottawa.
Chippewa	111967	Marine City, Mich., 1890.	Schr.	222.0	36.0	22.0	1105	Picton, Ont.	Ontario & Quebec Navigation Co., Picton, Ont.
D. G. 3	131029	Eburne, B.C., 1911	Scow	79.0	32.2	4.4	182	Vancouver, B.C.	Dewdney Gravel Co., Vancouver, B.C.
Edna R. Hines	130369	Ingonish, N.S., 1912	Schr.	41.0	12.9	8.0	18	Sydney, N.S.	A. J. Hines, Ingonish, N.S.
Fraser Mills No. 5	130495	Fraser Mills, B.C., 1910	Barge	83.2	34.6	8.5	227	New Westminster, B.C.	Canadian Western Lumber Co., Fraser Mills, B.C.
G. B. Zwicker	116352	Port Medway, N.S., 1912.	Schr.	40.8	11.0	5.8	13	Port Medway, N.S.	C. Zwicker, Port Medway, N.S.
Goderich	122612	Goderich, Ont, 1911	Dredge	82.0	30.0	7.0	259	Goderich, Ont.	W. Marlton and W. L. Horton, J.O.,Goderich, Ont.
Geo. Dansereau	130926	Grenville, Que., 1912	Barge	110.5	22.0	7.5	148	Montreal	G. Dansereau, Grenville, Que.
Ida M. Cunningham	126347	East Pubnico, N.S., 1912.	Schr	41.3	12.9	6.2	16	Barrington, N.S.	B. F. Cunningham, Cape Island, N.S.
Justice H	130593	Fourchu, N.S., 1912	"	60.0	18.4	8.2	48	Halifax, N.S.	A. B. Hooper, Fourchu, N.S.
Lola R	131078	Lunenburg, N.S., 1907	"	42.6	11.2	5.6	13	Lunenburg, N.S.	J. Reno, Herring Cove, N.S.
Old Glory	130383	Buffalo, N.Y., 1894	Dredge	84.0	31.6	7.5	199	Amherstburg, Ont.	J. G. Mullen, Amherstburg, Ont.
P. S. B. 6	131157	Vancouver, B.C., 1909	Scow	89.0	32.0	7.4	202	Vancouver, B.C.	Progressive Steamboat Co., Vancouver, B.C.
P. S. B. & D. Co. Dredge No. 1	131038	Seattle, Wash., (Unk.)	Dredge	119.0	31.2	8.7	484	"	West Coast Bridge and Dredging Co., Vancouver, B.C.
P. W. D. No. 109	131123	Duluth, Minn., 1905	"	133.6	43.4	8.7	766	Ottawa	Minister of Public Works, Ottawa.
R. M. & S. No. 1	130319	Toronto, Ont., 1902	Scow	100.0	28.0	7.5	174	Toronto	Roger Miller & Sons, Toronto.
R. M. & S. No. 4	130320	" 1912	"	100.0	30.0	7.5	187	"	" " "
R. M. & S. No. 5	131081	" "	"	100.0	30.0	7.5	187	"	" " "
R. M. & S. No. 6	131082	" "	"	70.0	24.0	5.5	80	"	" " "
R. M. & S. No. 7	131083	" "	"	62.0	23.0	5.6	78	"	" " "
R. M. & S. Dredge No. 2	130317	Milwaukee, Wisc., 1895	Dredge	74.2	28.9	5.9	122	"	" " "
R. M. & S. Scow No. 3.	130316	Morrisburg, Ont., 1912	Scow	70.0	20.2	4.3	44	"	" " "
Romance	130510	Bath, Maine, 1872	Schr.	58.8	17.4	6.0	32	Shelburne, N.S.	Lockeport Cold Storage Co., Lockeport, N.S.
Scow No. (8) Eight	130384	Sault Ste.Marie,Ont.,1892	Scow	111.6	26.6	7.0	208	Amherstburg, Ont.	J. G. Mullen, Amherstburg, Ont.
Scow No. Seventeen	130385	Manitowoc, Wis., 1906	"	100.3	26.0	8.9	232	"	" "
Secret	100471	Lunenburg, N.S., 1892	Schr.	78.5	24.1	9.0	76	Magdalen Islands, Que.	W. H. Starratt, Amherst Harbor, Que.
Unity	103803	Tatamagouche, N.S., 1904	"	117.8	31.7	11.7	248	Pictou, N.S.	A. Weatherbie, M.O., Tatamagouche, N.S.

Stranding of the s.s. Lake Champlain.

The following judgment was delivered Sept. 6, by Commander H. St. G. Lindsay, Wreck Commissioner, in the matter of the stranding of the C.P.R. s.s. Lake Champlain, in the St. Lawrence river, near Dominion park, Montreal, Sept. 3. The finding was concurred in by Capt. F. Nash, and T. Perron, pilot, who acted as nautical assessors.

The cause which led to the stranding was an error of judgment on the part of L. Z. Bouille, the pilot, being deceived by the glare of light from the north shore, in calculating his distance from Longue Pointe buoy on rounding same, and on account of the leading lights and all other lighted buoys in the channel to the westward being obscured by smoke or passing mist, being unable to judge his position accurately, and thinking he was too far to the north side of the channel. The court is of opinion that, under the circumstances, it is not necessary to deal with his license, and recommends that greater care should be exercised in future under all conditions, and speed reduced when any uncertainty as to the position of the vessel prevails. The court also suggests that seeing the conditions which prevailed at the time of the accident with regard to lights being obscured, are not unusual and are not likely to improve, range lights to the eastward, if such could be arranged, would be of great service under similar weather conditions, for vessels either up or down bound, and it would also recommend that compass courses be used when applicable in navigating the long stretches of the river, and is of opinion that had a compass course been set after rounding Longue Pointe buoy, the accident would in all probability not have occurred.

Shipbuilding in British Columbia.

The Victoria Board of Trade's committee on trade, commerce and transportation has recently reported that it considers it desirable that the board should renew its efforts to prevail on the Dominion government to encourage shipbuilding in Canada, claiming that Canadian shipbuilders suffer a great disadvantage in being in competition with British shipbuilders, in consequence of British built vessels being admitted into Canada duty free. The wages paid in Canada are higher than in Great Britain, owing to the tariff, and in addition, material has to be imported, and duty, ranging up to 52%, paid thereon, representing on a properly equipped vessel, approximately 15% of the total cost. In case of government work, the fair wage clause which is inserted in the tender form, imposes a serious handicap on British Columbia shipbuilders in competing with eastern shipbuilders, and an even greater handicap in competing with British shipbuilders. No allowance seems to be made when considering tenders, for the duty which the Canadian shipbuilders have to pay another department of the government on imported materials required for the construction of the vessel. The board of trade directed the government's attention to these conditions in 1906 and about the same time brought the matter to the notice of the Royal Commission on Transportation, with the result that that body made a recommendation in favor of protection for Canadian shipbuilders. The committee recommends that the board of trade obtain from the Pacific coast shipbuilders a definite statement in support of a request for a bonus, say equal to the difference of cost of construction, or, at least, the admission into Canada duty free of all the materials required in the construction of a vessel. The committee also urges strongly the importance of developing shipbuilding on a large scale, which would create a large field for subsidiary enterprises.

Changes in the Allan Royal Mail Steamship Line.

Announcement was made in Canadian Railway and Marine World for October of the retirement of Sir H. Montagu Allan and B. J. Allan from the Allan Line board, which with the previously announced retirement of J. Smith Park, left three vacancies. The Montreal Star's London correspondent recently stated that the vacancies had been filled by the election of F. W. Taylor, Thos. Reynolds and Sir Thos. Skinner, and continued to the effect that Sir Thos. Skinner's acceptance, he being a director of the C.P.R., will have a tendency to confirm the repeated reports of closer future relations between the Allan Line and the C.P.R.

We have been advised that W. J. Dott, Manager at Liverpool; J. A. Martin, Manager at Glasgow; and W. McK. Roden, General Passenger Manager at London, have been elected directors of Allan Bros. & Co. of the United Kingdom, agents of the Allan Line for Europe.

In connection with the various rumors as to the acquirement of control of the Allan Line by the C.P.R., which have had currency during the past two or three years, and which have been revived with continued persistency in the last few weeks, Sir Thos. Shaughnessy, President, C.P.R., is reported to have stated that the arrangements between the C.P.R. and the Allan Line are the same now as they have been for years past, and that no change is contemplated in them.

B. J. Allan, who has acted for the Allan Line in Boston, Mass., for several years, has also stated that there has been no amalgamation between the Allan Line and the C.P.R., and that the rumors all proceed from a mutually satisfactory arrangement for the handling of business at St. John, N.B., during the winter.

The reports as to the amalgamation with, or acquirement by, the C.P.R., chiefly emanate from Glasgow, where it is claimed that developments of an extraordinary nature, regarding the future control of the company, will be announced early in 1913. These, it is stated, will include the retirement of Hugh A. Allan and Andrew A. Allan, and in fact, the severance of all the Allan associations with the company's management.

A Montreal press report quotes a cablegram received there as saying:—"The joint stock companies registration in Edinburgh of the Allan Line Steamship Co. shows that the Royal Trust Co. of Montreal holds 57,637 shares, the total being 60,639 shares. Sir Montagu Allan is registered as holding 500 shares. Allan Bros. and Co. is the title of a separate company."

The Loss of the s.s. Eric.

The following judgment, concurred in by Capts. N. Hall and J. W. Harrison, was delivered by Commander H. St. G. Lindsay, Dominion Wreck Commissioner, recently, in the matter of the stranding and subsequent loss of the British s.s. Erie, on Sable island, N.S., Aug. 14:—

After reviewing the evidence, which, on account of all log books, documents, etc., being lost, was given entirely from memory, the court finds that the vessel was well found and equipped and apparently navigated in a proper and seamanlike manner, up to the morning of Aug. 14, and that the cause which led to the stranding, was owing to the master, W. G. Corner, being over confident as to his position, and in approaching, and trying to make, such a well known danger as Sable island, and presuming his position on Aug. 13 to be correct he showed very poor judgment on finding the water shoaling so perceptibly, in not taking another cast of the lead or hauling off to the eastward, or stopping his vessel until the weather cleared or he was able to find out his position, and therefore the court suspends his certificate for three months from Aug. 26.

The court also criticized the want of cooperation by the officers in the working up of the vessel's position, and compass errors, as a check on the master's work.

During August, four employes were killed, and six were injured in the course of their work in connection with the navigation of Canadian waters. Two of the fatalities were due to drowning, and one each to falling from the mast head, and to scalding, while of the other accidents, two were caused by falls, and one each by scalding, falling material, machinery, and by being crushed.

Sault Ste. Marie Canals Traffic.

The following commerce passed through the Sault Ste. Marie Canals during September, 1912:

Articles			Canadian Canal	U. S. Canal	Total
Copper	Eastbound	Short tons	208	12,804	13,012
Grain	"	Bush'ls	2,542,593	2,192,097	4,734,690
Building stone	"	Short tons			
Flour	"	Barrels	269,220	923,354	1,192,574
Iron ore	"	Short tons	4,950,988	2,389,237	7,340,225
Pig Iron	"	"	20		20
Lumber	"	M. ft. b.m.	1,211	98,950	100,161
Silver ore	"	Short tons			
Wheat	"	Bushels	9,957,593	7,348,899	17,306,422
General merchandise	"	Short tons	2,393	32,689	35,082
Passengers	"	Number	1,846	2,789	4,635
Coal, hard	Westbound	Short tons	67,794	326,732	394,526
Coal, soft	"	"	304,553	1,176,482	1,481,035
Flour	"	Barrels			
Grain	"	Bushels			
Manufactured iron	"	Short tons	30,615	50,158	80,773
Iron ore	"	"	3,472		3,472
Salt	"	Barrels	3,045	77,932	80,977
General merchandise	"	Short tons	89,816	108,231	198,047
Passengers	"	Number	3,280	1,790	5,070
Summary.					
Vessel passages	"	Number	1,049	2,164	3,213
Registered tonnage	"	Net	3,610,160	4,620,787	8,230,947
Freight—Eastbound		Short tons	5,335,466	2,962,338	8,295,804
" —Westbound		"	496,685	1,673,293	2,167,978
Total freight		"	5,832,151	4,635,631	10,467,782

Telegraph and Cable Matters.

The Canadian Northern Telegraph Co. has opened an office at Morrin, Alta.

The Western Union Telegraph Co. will shortly move its Victoria, B.C., offices to the Central block, where a considerable expenditure will be made in bringing the office thoroughly up to date.

G. A. C. Phillips, heretofore assistant local manager C.P.R. Telegraphs, Toronto, has been appointed local manager at Calgary, Alta., and has been succeeded at Toronto by G. Paton, heretofore accountant there.

W. W. Ryder, heretofore General Superintendent of Telegraphs, New York Central Lines, Chicago, Ill., has resigned on his appointment as Manager of the Western Union Telegraph Co.'s railway department, with office at New York.

G. A. C. Phillips, heretofore assistant local manager, C.P.R. Telegraphs, Toronto, has been appointed local manager at Calgary, Alta. He entered the service 20 years ago, and has been continuously connected with the Toronto office.

The Great North Western Telegraph Co. was charged at the Toronto police court, Oct. 10, with wilfully assisting in gaming, wagering and betting by the transmission of telegrams relating to betting on horse races. The case was sent for trial.

The Great North West Telegraph Co. has opened offices at Gorrie and Lions Head, Ont., and Ha Ha Bay Jct., Que., and has closed its offices at Clifton House, Niagara Falls; Crediton, Formosa and Wheatley, Ont., Lotbiniere and Richmond, Que.

At the annual meeting of the Western Union Telegraph Co. in New York, Oct. 9, T. N. Vail, President, advocated the combined use of the plants of the Western Union Telegraph Co., and the American Telephone and Telegraph Co., of which he is also President.

E. C. Keenan, heretofore Superintendent of Telegraphs, Lake Shore and Michigan Southern Ry., Cleveland, O., has been appointed General Superintendent of Telegraphs, New York Central Lines, west of Buffalo, N.Y., and will also represent the Western Union Telegraph Co., with office at Chicago, Ill.

The annual meeting of the Great North West Telegraph Co. was recently held at Toronto, when the financial statements for the past year were submitted and adopted by the shareholders. The meeting was subsequently adjourned to a date to be decided on later, when the officers for the current year will be elected.

The Great North West Telegraph Co., on account of the increase in traffic, has been compelled to lease additional space over its present office in Winnipeg, and Superintendent of Equipment Davies recently left Toronto for Winnipeg for the purpose of making the necessary changes in, and additions to, the electrical equipment there.

F. F. Riefel, heretofore Assistant Division Superintendent, Franklin division, Lake Shore and Michigan Southern Ry., has been appointed Superintendent of Telegraphs, vice E. C. Keenan, appointed General Superintendent of Telegraphs, New York Central Lines, west of Buffalo. He will also represent the Western Union Telegraph Co., with office at Cleveland, Ohio.

The C.P.R. has opened telegraph offices at Cadogan, Purple Springs, Alta.; Cedar, Clanwilliam, Glenogle, Tappen, B.C.; Marconi, Murdoch, Man.; Loon, Meadowside, Ont.; Baring, Belbeck, Bounty, Cabri, Conquest, Cutknife, Dafoe, Horizon, Kennedy, Meeta, Mozart, Neville, Pennant, Piapot, Plunkett, Primate, Regina Beach, Stranraer, Success, Vanguard, Viceroy, Waseca, Wymark, Sask.

A London press dispatch states that the Pacific Cable Board, operating the cable between Canada and Australia, is considering the question of installing a high power wireless telegraph system, instead of, as has been proposed, duplicating the existing cable. It is stated that expert opinion has decided that with such a wireless system supplementing the present cable, the best possible service would be provided. It is also announced that the Board is conducting negotiations with the U.S. companies with a view to a reduction of 3c. a word on press messages to and from Australia.

The city of Hamilton, Ont., has applied to the Board of Railway Commissioners for an order to compel telegraph, telephone and other companies using overhead wires to place their wires under ground in the central portion of that city. Plans for the carrying out of such work have been submitted by the city engineer, and it was claimed at the recent hearing at Toronto, that they were feasible and reasonable, and that there was no danger in placing high and low tension wires in the same conduits so long as they were separated by vitrified terra cotta. In apposition to this it was stated by Prof. Herdt, of the Electric Service Commission, Montreal, that the cost of installing services had not been reckoned with, and his experience in Montreal showed that this in addition to being a most difficult engineering problem, was one of enormous expense. The Great North Western Telegraph Co. contended that the burden was commercially impossible for that company, as its entire revenue from Hamilton was only $18,486, and the operating expenses over $15,000 a year.

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Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time we wish our readers to distinctly understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

E. S. Jenison, formerly with the Henion and Hubbell Co., Chicago, Ill., has been appointed Manager of the pump department of CANADIAN FAIRBANKS-MORSE CO., Ltd., who are now the exclusive sales agents in Canada for the triplex and power pumps, as well as the other lines manufactured by The Goulds Mfg. Co., of Seneca Falls, N.Y.

S. F. BOWSER AND CO., oil tank and oil storage system manufacturers, Fort Wayne, Ind., and Toronto, have appointed E. H. Briggs as railway salesman for the southwest territory, including Texas, New Mexico, Kansas, Nebraska, Arkansas, Missouri, Louisiana, Wyoming and the Dakotas. E. F. G. Meisinger has been given the territory west of the Rocky mountains.

THE OHIO BRASS CO., Mansfield Ohio, has issued Tomlinson Car Coupler Equipment, a 60 page booklet, 11 by 8 ins., thoroughly describing and illustrating this equipment for electric railway service, including automatic radial car couplers, automatic air connecting car couplers, M.C.B. automatic car couplers, spring draw bar carriers, draft gears and accessories. Copies will be sent postpaid on request.

BESLY'S MODERN DISC GRINDING Practice, a book of 111 pages, with 103 illustrations, issued by Chas. H. Besly and Co., Chicago, Ill., has been prepared with a view to answering about every question that may arise in regard to the use of disc grinders. Its contents include the spiral disc grinder, the machine, application of the grinder, amount of stock to be removed, distribution of ground surface, thickness of adjacent stock for absorbing the heat from grinding and for resisting distortion, checking the work, rotary process of flat surface grinding, selecting circles, ring wheel grinders, grinders in the tool room, on the erecting floor and among the vise hands, in the wood pattern shop, automobile factory, gas engine shop and railway shop test department.

THE AMERICAN LOCOMOTIVE CO., which owns the Montreal Locomotive Works, and includes the operation of them in the accounts with its other plants, made a net profit for the year ended June 30, of $1,867,554.21, which, after paying 7% dividend on common stock, $1,750,000, left a surplus of $117,554.21, a decrease of $1,608,007.55 from 1910-11. The volume of sales for the first half of the fiscal year was at a low ebb, and was equivalent to only 33% of the amount of business necessary to keep the plants running at full capacity. Since Jan. 1, 1912, there has been a much stronger demand for new locomotives with the result that the amount of unfilled orders on the books on July 1 was $14,450,000, compared with $6,015,000 at the beginning of the year. Apart from the loss in profits due to the natural decrease in business, the company suffered serious financial loss as a result of a strike of its boilermakers which affected practically all of its plants and lasted from Oct., 1911, to Feb., 1912. During this period production was badly retarded, and at times the plants were practically at a standstill.

Freight Car Balance and Performance.—The American Railway Association's statistical report of freight car balance and performance, covering six Canadian lines reporting, for June, shows, 116,142 revenue freight cars owned, average number of system cars on line, 74,476; average foreign cars on line, 59,529; total cars on line, 134,005; excess, 17,863; private cars on line, 3,335; percentage of cars in shops, 5.37; freight locomotives owned, 2,025; average cars on line per freight locomotive, 68; total freight car mileage, 103,347,360; average miles per car per day, 25.1; per cent. loaded mileage, 75.3; ton miles of freight, 1,456,578,540; average ton miles, per car mile, 15.2; per loaded car mile, 21.8; per car per day, 354; gross freight earnings, $10,381,113; average daily earnings, per car owned, $2.56; per railway car on line, $2.62; all cars on line, $2.49. The report to Sept. 26, showed surpluses of 2,064 box, 51 flat, and 87 other cars, a total of 2,202 cars and shortages of 943 box, 471 flat, and 460 others.

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Tenders for Street Cars

Sealed tenders for ten Street Cars for the Brandon Municipal Railway will be received until November 15, 1912, at 4 o'clock p.m. All tenders must be addressed to Harry Brown, City Clerk, Brandon, Manitoba, Canada, and must be marked "TENDERS FOR STREET CARS." Copies of plans and specifications may be had upon application to the Street Railway Engineer, Brandon, Manitoba, Canada.

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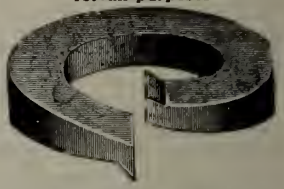

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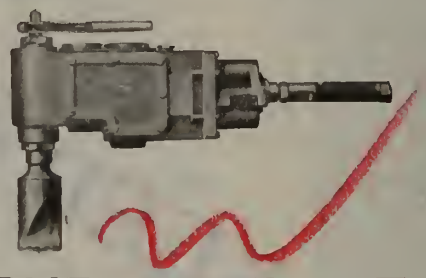

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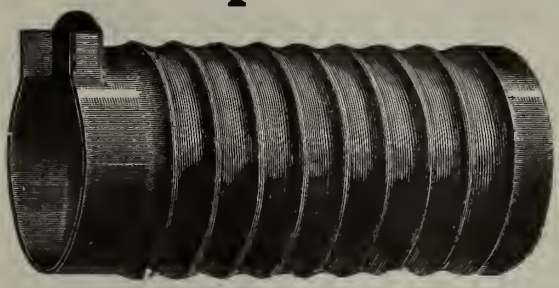

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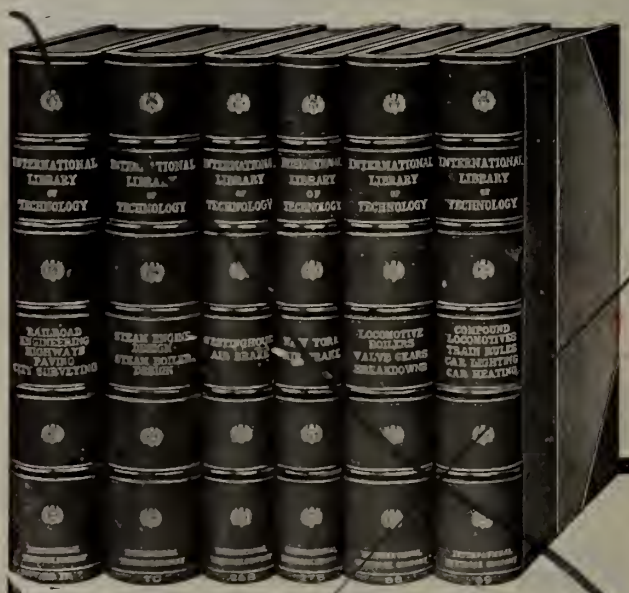

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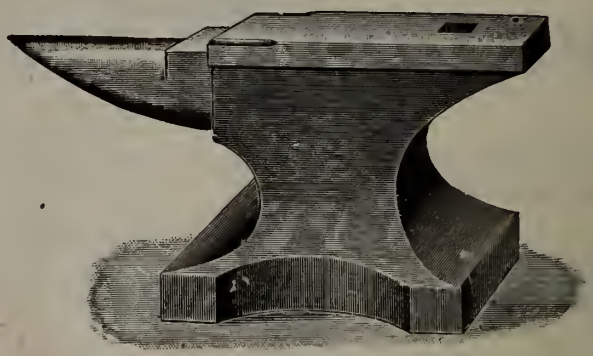

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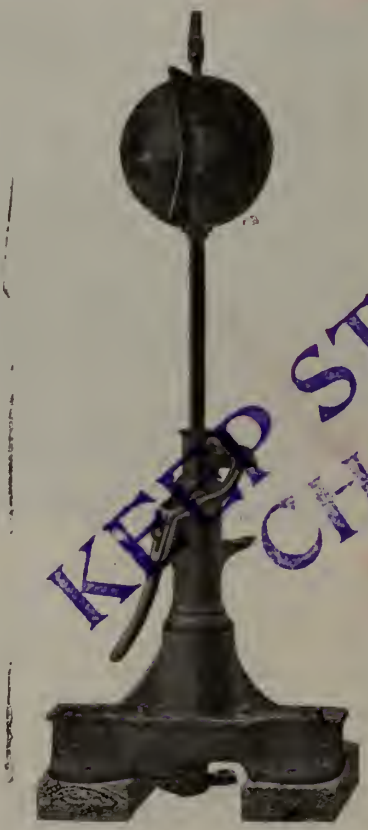

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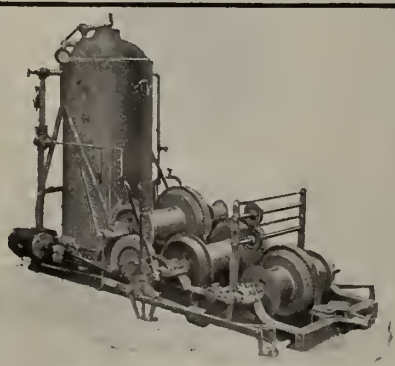

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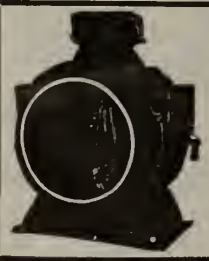

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Gentlemen: 1. Replying to your letter of August 26th, 1912, you are informed that the welded stern post of the steamer "Gen. Nathaniel Greene," which you repaired for this Department at New London, Conn., in 1907, is still in service on that vessel and giving satisfactory results.

2. It is general policy of this Department to not permit the publishing of any official reports upon commercial products or processes, but in this particular case there would appear to be no objection to your use of the foregoing statement of fact regarding the continued use during the past five years of the stern frame welded by you.

By direction. Respectfully,
(Signed) WILLIAM E. HORTON,
Major, Quartermaster Corps, U.S. Army.

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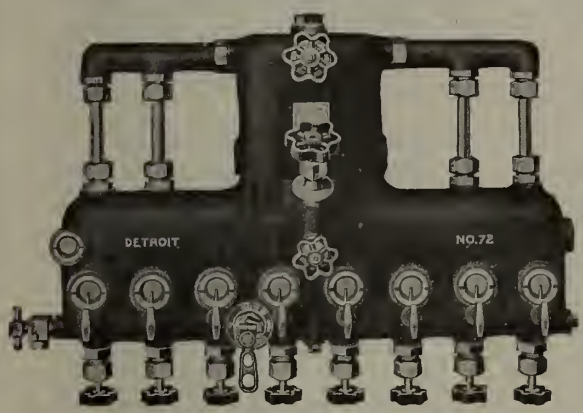

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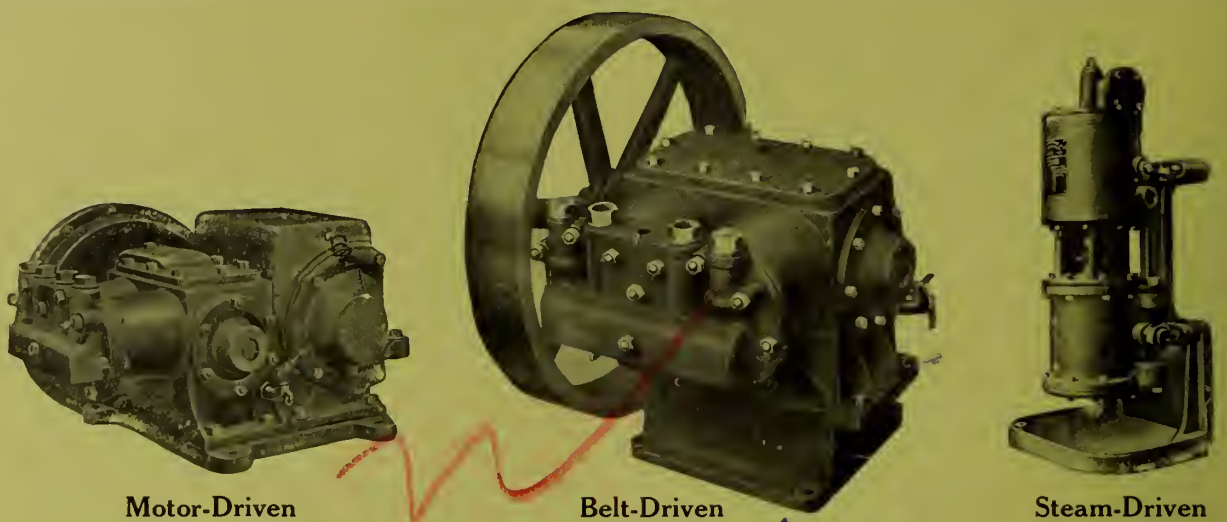

Motor-Driven Belt-Driven Steam-Driven

Westinghouse Air Compressors

It is easy to have a simple and reliable air compressing plant with Westinghouse Compressors. They occupy the smallest possible space, yet are designed with ample proportion of all wearing parts. They are the accepted standards for steam and electric railway air brake systems.

Canadian Westinghouse Co., Limited, Hamilton, Ontario

TORONTO Traders Bank Building | MONTREAL 52 Victoria Square | OTTAWA Ahearn & Soper, Ltd. | HALIFAX Telephone Bldg. | WINNIPEG 158 Portage Avenue East | CALGARY 311 8th Avenue West | VANCOUVER Bank of Ottawa Bldg.

Street Railway Motors

IN SNOWSTORMS AND BLIZZARDS

THE WINONA INTERURBAN RAILWAY

Warsaw, Indiana, Feb. 25, 1912.

Allis-Chalmers Co.,
West Allis, Milwaukee, Wis.

Dear Sirs,—No doubt you will be pleased to learn of the successful operation of the R-75 Motors during the recent snowstorm and blizzard which we have had in this part of the country.

We have encountered snow drifts from two to six feet deep on our system. The cars equipped with the R-75 Motors going through drifts for two days without any attention whatever and giving us no trouble whatever, not loosing a single armature or field coil during this severe service. When we were able to get the cars in for inspection we found the motors absolutely dry inside and the oil boxes with no moisture whatever. However, we did have one motor with the motor cover lost off. and when this motor was discovered we found the shell one-third full of water. This was taken out of the motor and same put back into service.

The service which the R-75 motors have given us during the past week satisfies me that these motors will work under any existing conditions.

Yours truly,
(Sgd.) Chas. Sigler.
S.M.P. & M.M.

Allis-Chalmers-Bullock, Limited

WORKS: Montreal SALES OFFICES: Montreal Toronto Cobalt Winnipeg Calgary Vancouver

The First Principle of Signaling

is to provide means to positively insure that the signal will be seen at all times, under all circumstances and all weather conditions.

It is not sufficient that the signal *can* be seen or *ought* to be seen. To secure positive results it should be so displayed that it *must* be seen.

In view of the remarkable improvements which have been made in signaling methods during the last few years, it is rather surprising that so little has been accomplished in the application of this fundamental principle in a practical way.

While the Simmen System of Railway Signaling is designed, in its complete application, to provide full protection for trains, it is certainly not the least valuable characteristic of this system that its basic feature viz: the Simmen Cab Signal, is so designed that it may be applied at remarkably low cost as an auxiliary to semaphore signaling, whether the latter be automatically or manually controlled.

With the Simmen Cab Signal, the engineer has immediately in front of his eyes, at all times, right within his cab, a green light as long as he has a clear track. If a semaphore is set against him, the light in his cab changes to a red light in ample time to give him full warning of the semaphore signal set against his passage.

There is absolutely no possibility of the cab signal escaping the engineer's attention in any kind of weather or under any conditions of operation.

The positive and unfailing operation of the Simmen Cab Signal is not theoretical; it has been fully and clearly demonstrated by over three years of steady service.

Under the Simmen System, the first cost of adding this extremely valuable feature as an auxiliary to existing signal protection is very low and the maintenance cost is negligible.

This company is prepared to demonstrate to any railway the value and economy of this single feature of the Simmen System, or of the Simmen System as a whole, designed for full protection of train movements.

Descriptive literature will gladly be furnished upon request.

KEEP STANDING

Northey-Simmen Signal Co., Ltd.

701-2 Confederation Life Chambers :: Toronto, Canada

It's tests like this that clinch the supremacy of Titanium Rails

Three mills competed. The superior wearing qualities of the Titanium open-hearth product, as demonstrated in this test, confirms our former published statement that no railroad operator or stockholder can afford to ignore Titanium Rails. Complete details of tests on other roads will be sent on application.

In 19 months' test on Boston & Maine, Titanium open-hearth rails proved 55 to 186 per cent. superior to plain open-hearth and plain Bessemer rails

In the face of facts like these, the extra cost of Titanium rails—only about $2 per gross ton—is remarkably low. Booklet No. 30 explains in detail the action of Titanium. When you write ask for rail diagrams and full information regarding the Boston & Maine test.

TITANIUM ALLOY MANUFACTURING CO.

Operating Under Rossi Patents — *Processes and Products Fully Patented*

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THE PRIMOS CHEMICAL CO.
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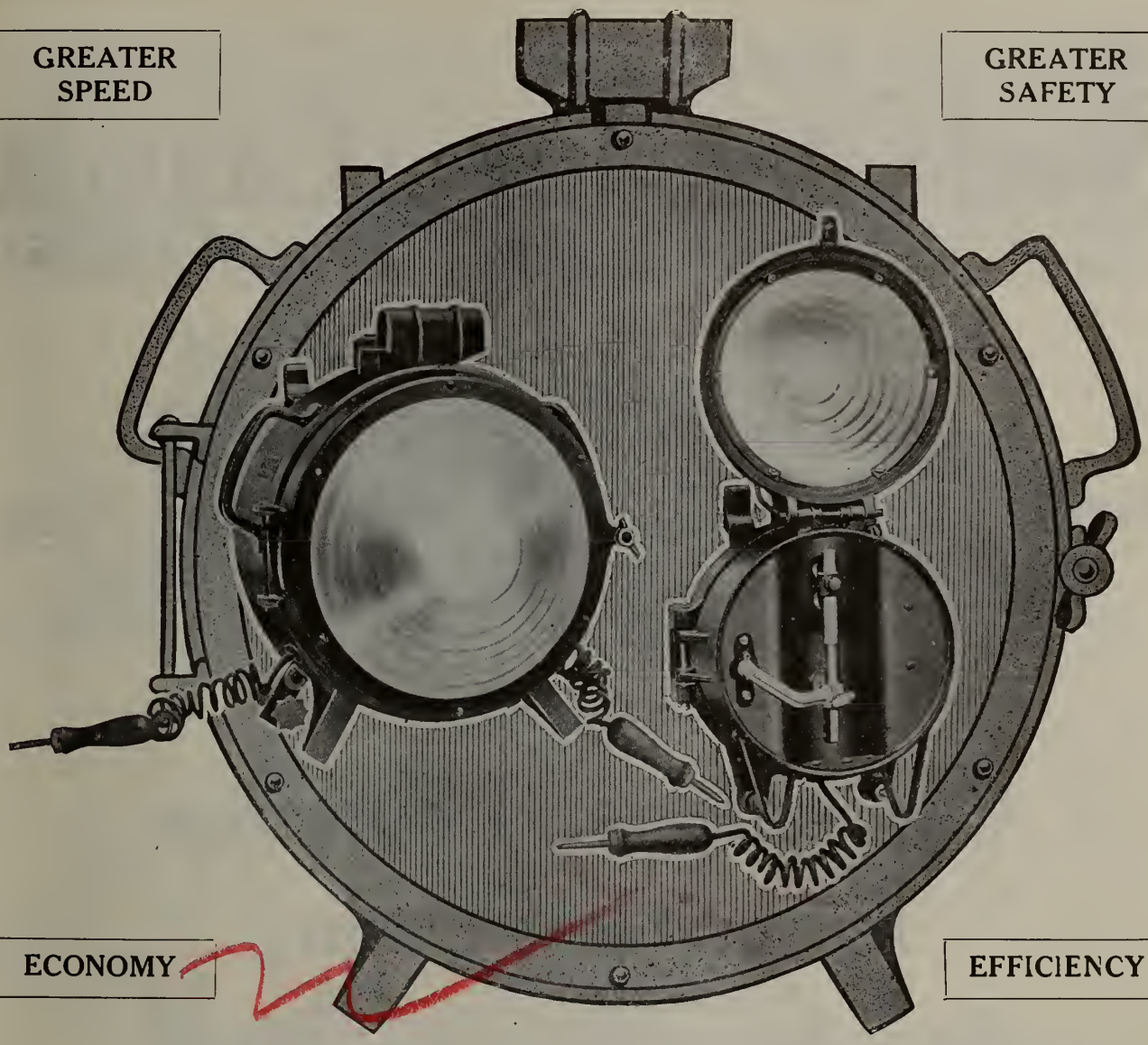
GREATER SPEED

GREATER SAFETY



ECONOMY

EFFICIENCY

New 4 Ampere and 2 Ampere Luminous Arc Headlight

In hundreds of cities, thousands of G-E Luminous Arc lamps are giving the utmost satisfaction. The same principles in the manufacture of these highly efficient street lamps are embodied in the Luminous Arc Headlight.

4 Ampere—All possible requirements and conditions of service can be met.

A constant steady light is maintained throwing a wide angle beam about 2,000 ft., without interfering with traffic paralleling the track.

Intown dimming is accomplished by reversing polarity or using incandescent lamps—a screen is unnecessary.

The new draught device prevents fume deposit on lens of mechanism.

Mechanism is carefully and substantially built; working parts are readily accessible for inspection.

Side handles on headlight make it convenient to carry.

Upper electrode is practically non-consuming, having a life of over 2,000 hours; lower electrode burns with a brilliant white light from 60-80 hours.

2 Ampere—Built on the same principles as the 4 amp. and designed primarily for suburban service.

Throws a concentrated beam of light from 600-800 ft.

An iron wall separates mechanism from arc, allowing free ventilation and a steady arc.

Mechanism is easily accessible and can be locked to prevent tapering.

The draught device keeps lens and mechanism free from fume deposit.

Can be furnished for portable or for permanent mounting.

Canadian General Electric Co., Limited

Head Office: TORONTO

Montreal Halifax Ottawa Cobalt South Porcupine Winnipeg Calgary Vancouver Victoria Nelson Prince Rupert

THE
Steel Company of Canada
LIMITED

Railroad Track Equipment
Angle Bars Tie Plates
Steel Track Spikes Bolts & Nuts

PIG IRON
Foundry Basic Malleable

Car Axles and Forgings
Invincible Fencing
Bar Iron Bar Steel

Arm Braces Wood and Machine Screws
Copper Trolley Wire, Telephone and Galvanized Wire
Nails Tacks Wrought Pipe

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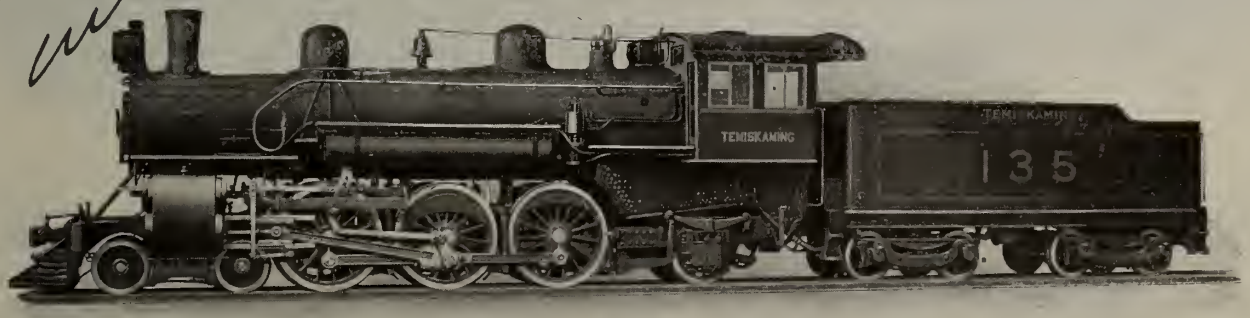
J. B. H. Rickaby, Victoria, B.C.
H. G. Rogers, St. John, N.B.
Geo. D. Hatfield, Halifax, N.S.

Consolidation Locomotive, built for Canadian Pacific Railway

Total weight of engine in working order	221,800 pounds
Weight on driving wheels	192,600 pounds
Diameter of driving wheels	63 inches
Boiler pressure	180 pounds
Cylinders	23½ x 32 inches
Superheater	Vaughan-Horsey
Maximum tractive power	43,000 pounds



Pacific Type Locomotive, built for the Timiskaming and Northern Ontario Railway.

Total weight of engine in working order	203,100 pounds
Weight on driving wheels	133,375 pounds
Diameter of driving wheels	69 inches
Boiler pressure	200 pounds
Cylinders	21 x 28 inches
Maximum tractive power	30,000 pounds

Canadian Locomotive Co., Ltd.

KINGSTON, ONTARIO

BUCYRUS STEAM SHOVELS

SPECIALLY BUILT FOR HEAVY WORK

REVOLVING SHOVELS ON TRUCKS OR TRACTION
SPECIAL SHOVELS FOR MINES AND QUARRIES

DRAG LINE EXCAVATORS, DREDGES, WRECKING CRANES,
LOCOMOTIVE PILE DRIVERS, UNLOADING PLOWS

MUSSENS LIMITED

Head Office: MONTREAL

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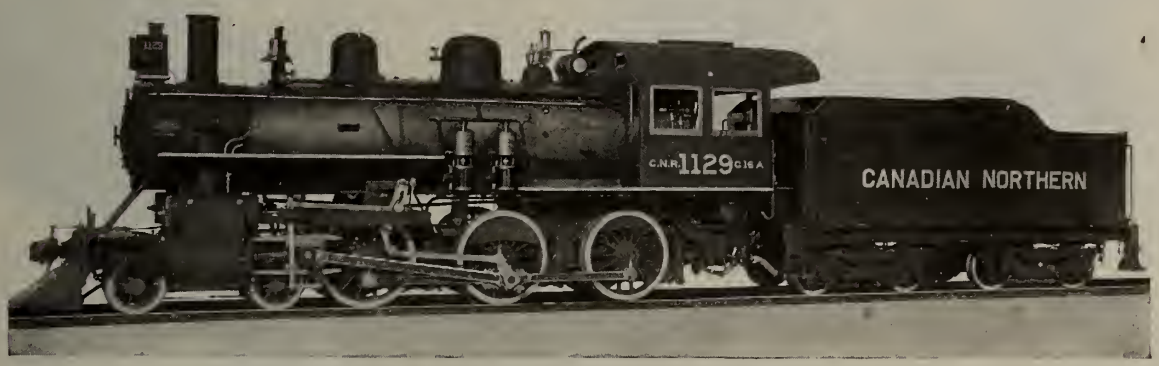
TEN WHEEL LOCOMOTIVE

CANADIAN NORTHERN RAILWAY



Total weight of engine, 154,000 pounds.
Weight on drivers, 112,500 pounds.
Diameter of drivers, 57 inches.
Boiler pressure, 170 pounds.
Cylinders, 20 x 24 inches.
Maximum tractive power, 24,300 pounds.

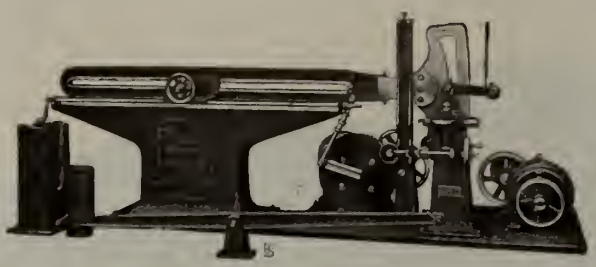
MONTREAL LOCOMOTIVE WORKS, LTD.

DOMINION EXPRESS BUILDING, MONTREAL, CANADA

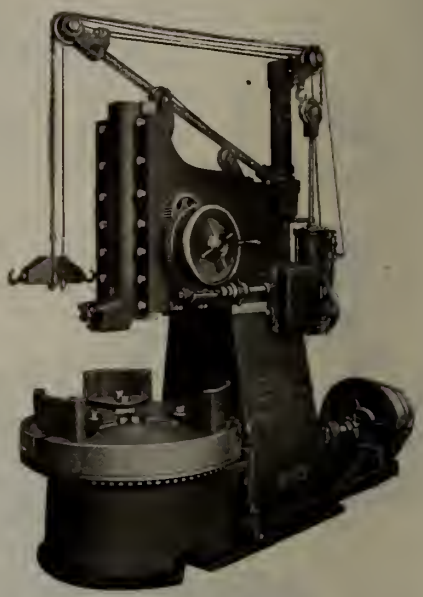
RAILWAY AND LOCOM

C.M.C.

COACH WHEEL LATHES
DRIVING " "
AXLE LATHES

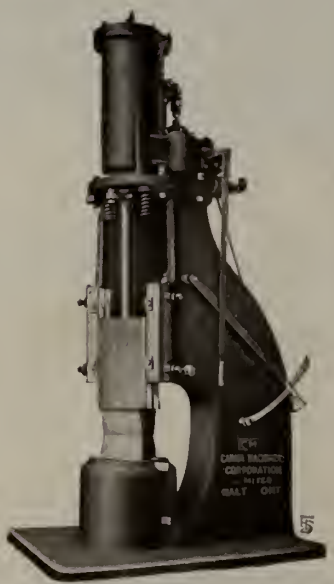


LOCOMOTIVE LINK GRINDER



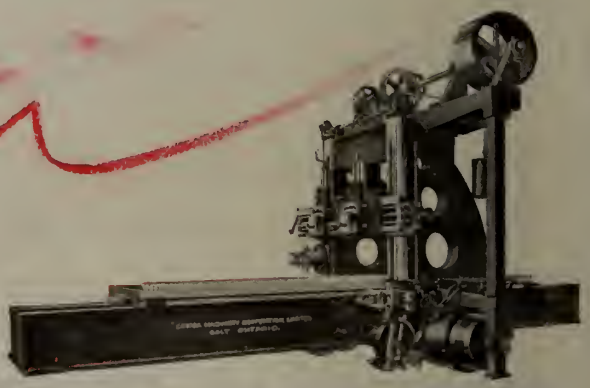
42" CAR WHEEL BORING MACHINE

SHAPERS SLOTTERS HAMMERS



SINGLE FRAME STEAM HAMMER

Builders of Railway and Locomotive Shop Tools. Largest Lathe Builders in Canada.



60" FORGE PLANER

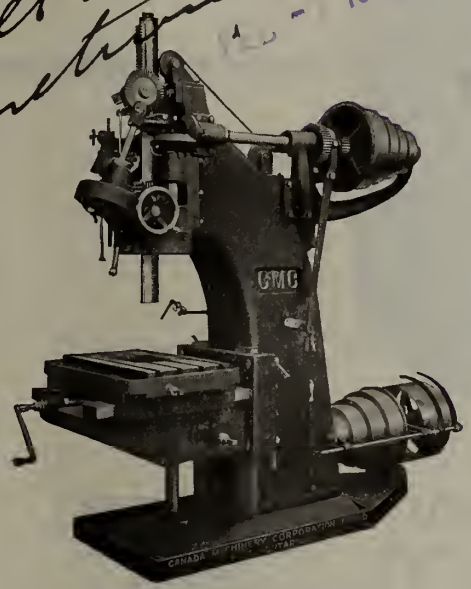
CANADA MACHINERY CO

OTIVE SHOP TOOLS

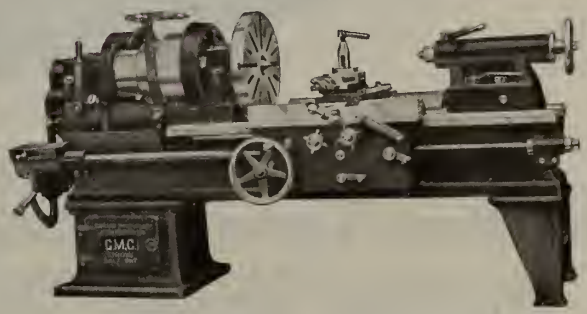
returned
1913

ENGINE LATHES
GAP "
BREAK "

C.M.C.



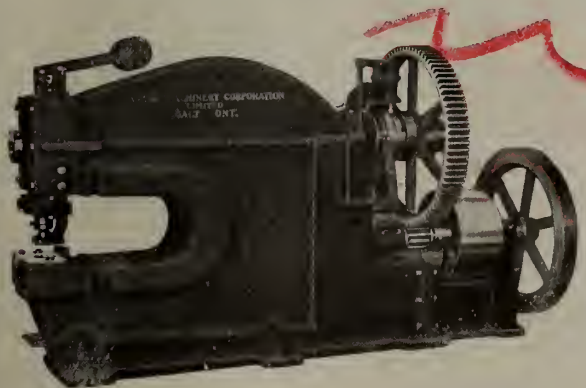
36" HEAVY DUTY DRILLING MACHINE



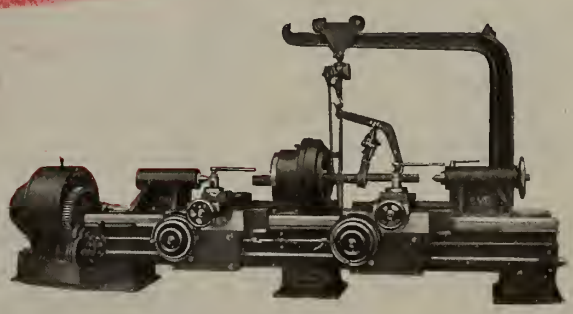
20" x 8' Q.C. ENGINE LATHE

Builders of High Grade Machine Tools for General Railway and Locomotive Shops. Our Catalogue on Railway Shop Tools sent on Request.

PUNCHES PLANERS PRESSES

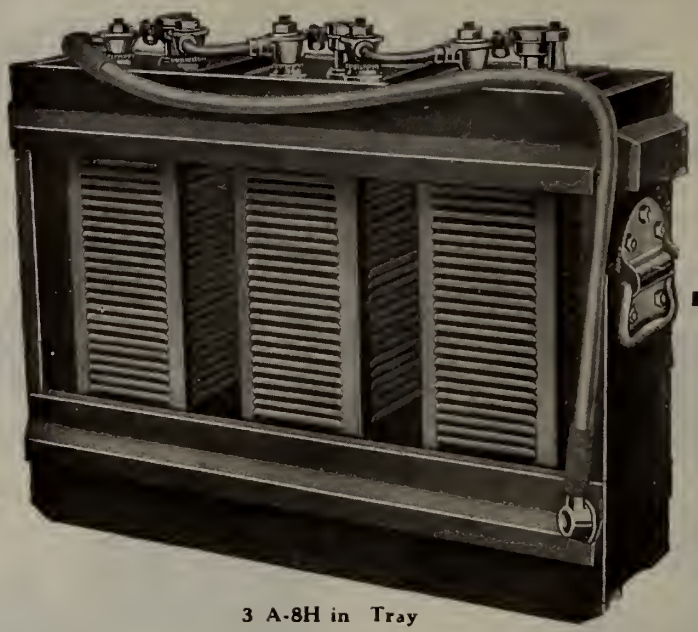


SINGLE END PUNCH, 36" THROAT



DOUBLE AXLE LATHE

PORATION LTD., GALT, ONT.



3 A-8H in Tray

The Best Train Lighting System is Electrical
The Best Storage Battery Is The Edison

The construction of the Edison Cell (consisting of element, electrolyte and container) constitutes a wholly new departure in storage battery practice, which immensely increases the range of usefulness in railway work.

In Railway Work Reliability is Essential

Where the strait storage, the axle generator, or the head-end generator system is used, reliability of the storage battery is the vital point. Why fuss with lighting equipment requiring constant expert attention to keep going and heavy to handle and to haul, when the storage battery of to-day is the care-free, long lived Edison Battery?

The Edison Battery saves one ton in weight per car on 32 volt lighting equipment. Its trays weigh only 100 lbs. and can be handled easily by one man. Its care and operation is as simple as A-B-C. It can be charged when convenient, and will stand discharged indefinitely without injury. It is totally free from "sulphation," or any sort of corrosion, making the storage battery the most dependable, instead of the most unreliable part of the train lighting system.

It will pay you to send for our newest bulletin No. 1018 "Edison Train Lighting Batteries."

The Canadian Fairbanks-Morse Company
Limited

Montreal St. John Ottawa Toronto Winnipeg Saskatoon Calgary Vancouver Victoria

Intercolonial Railway

Ocean Limited

Will leave MONTREAL 7.30 p.m. daily

Bonaventure Union Depot

For Quebec, Lower St. Lawrence, Moncton, Halifax

Direct connection for St. John, N.B., The Sydneys, Prince Edward Island, Newfoundland (except by Ocean Limited, leaving Montreal Saturday).

Maritime Express

Will leave Montreal 8.15 a.m. (daily, except Saturday) for Maritime Provinces.
Grand Trunk trains for Montreal make direct connection at Bonaventure Union Depot, Montreal.

YOU Will enjoy reading the Descriptive Booklets of the Canadian Government Railways, Intercolonial Railway, Prince Edward Island Railway.

"The Ancient Capital"
Quebec the Niobe of the new world Cities. Its past history and romance.

"The City of the Loyalists"
St. John, N.B., its past and present. Its pleasant location and promising outlook.

"Storied Halifax"
The Nova Scotia capital in the good old days, when warfare raged and prize money flowed like water.

"The Garden of the Gulf"
The summer beauties of Prince Edward Island. A part of Canada no tourist can afford to miss.

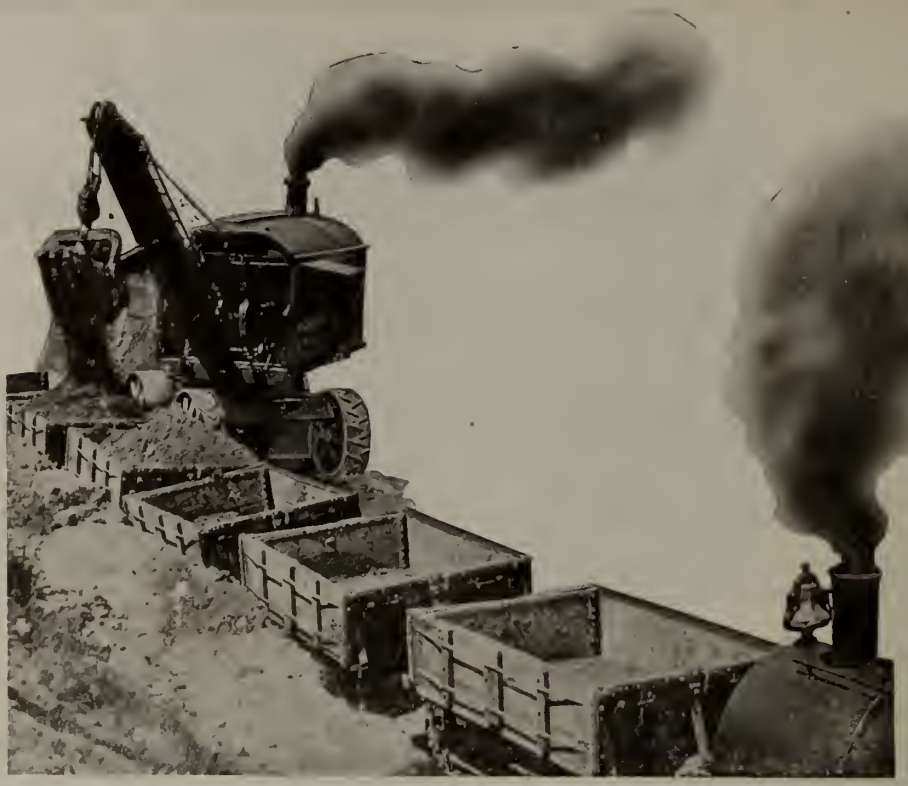
"Fishing and Hunting"
Some of the latest facts concerning the Famous Streams of Eastern Canada, and about the hunting of big game.

They are artistically illustrated, and can be obtained free of charge by writing to the

General Passenger Dept.

INTERCOLONIAL RAILWAY

MONCTON, N.B.



Construction Equipment of all Descriptions for RAILROAD BUILDING

"Marion" Steam Shovels

All capacities from 5-8 cubic yard to 6 cubic yard dippers. Built of the very best materials—Standard and Revolving Types.

"Kilbourne & Jacobs" Dump Cars

These cars are built with Pressed Steel Channel Arch-Brace Underframes, which bind the trucks firmly together, also form the supports for the car bed in dumping. We want you to investigate these cars. It will pay you.

"Davenport" Locomotives

We can supply Locomotives in all sizes for any practical gauge. Let us send you catalogues.

Steel Rails, Wheel and Drag Scrapers, Plows, Track Tools, Hoisting Engines, Concrete Mixers, Rock Crushers, Derricks, Wire Rope, Etc., Etc.

F·H·Hopkins & Co

BRANCH WINNIPEG, MAN. MONTREAL BRANCH VANCOUVER, B. C.

Galena-Signal Oil Company

Franklin, Pa., and Toronto, Ont.

Sole manufacturers of the celebrated GALENA COACH, ENGINE and CAR OILS, and SIBLEY'S PERFECTION VALVE and SIGNAL OILS.

GUARANTEE COST per thousand miles for from one to five years, when conditions warrant it.

Maintain EXPERT DEPARTMENT, which is an organization of skilled railway mechanics of wide and varied experience. Services of Experts furnished free of charge to patrons interested in the economical use of oils.

STREET RAILWAY LUBRICATION A SPECIALTY

USE

Galena Railway Safety Oil "B"

in Marker and Classification Lamps, to secure Efficiency of Service, Maximum Candle Power, Clearness of Light.

Galena Long Time Burner Oil

for use in Switch and Semaphore Lamps, and all lamps for long time burning, to avoid smoked and cracked chimneys and crusted wicks.

Tests and Correspondence Solicited.

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ASBESTOS LUBRICANTS

LUBRICANTS THAT

KILL HEAT

PRESERVE THE METALS

PREVENT FRICTION

This Mark **Our Guarantee**

Asbestos Lubricants introduce an entirely new system by which a lubricant will retain its original efficiency, no matter what the conditions of wear or climate. The idea in this is to neutralize the distinctive effect of heat by producing a lubricant which in itself possesses the quality of resisting heat. Asbestos, which is the greatest heat-resisting substance, is amalgamated with High Grade Oils. This absolutely eliminates over-heated bearings and allows the machinery to run without the slightest friction, thus prolonging its life.

Journolene

For the journals of Railroad Cars, Street Cars, Pulp & Paper Mills, Foundries, Steamships, and all machinery of heavy duty.

Asbestolene

Destroys the rattle of manufacturing machinery, replacing it by a musical hum that tells of smooth running with maximum efficiency. Specially prepared for gears.

Spedolene

This is specially prepared for Motor Cars and Trucks. It will last longer than any other lubricant, will positively deaden noise, and will not run out at the gear cases. After once used you will always specify it.

Axolene

This is the highest grade of axle grease; it forms a perfectly smooth durable coating on the axle. After this surface is once formed you need use less than 1-2 as much Axolene as of any other axle grease. "Axolene will never cake."

Write at once for our booklet on "SCIENTIFIC LUBRICATION." You will be interested in striving to cut down your lubrication expenses.

Cupolene

For all kinds of compression cups and bearings. Cupolene is the ideal lubricant for armatures in Street Railway Cars. The wearing qualities are wonderful.

The Railway Asbestos Packing Company, Limited

Sole Manufacturers

Head Office and Plant, - - SHERBROOKE, QUEBEC

All Along the Line

from Dispatcher's Office

to

Every Way Station Operator

NORTHERN ELECTRIC

Selector Apparatus

Is the Very Best Kind of Service Insurance

¶ Thorough service tests made before shipment insure the continuous and uninterrupted operation of the equipment.

¶ It pays to install telephone material that has a well-founded reputation.

TELL DEPT. 3007 YOUR NEEDS

THE Northern Electric AND MANUFACTURING CO. LIMITED

Manufacturer and Distributor of Telephone Apparatus, Electrical Supplies and Fire Alarm Apparatus for every possible need.

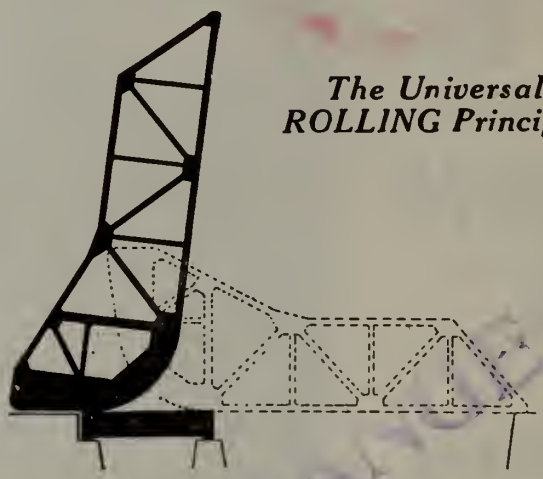
MONTREAL HALIFAX TORONTO WINNIPEG REGINA CALGARY EDMONTON VANCOUVER

"Why Scherzer ROLLING Lift Bridges

are the least expensive and most efficient for all channels—wide or narrow."

Scherzer ROLLING Lift Bridges expedite land and water traffic. They use the only correct principle for transportation on land—the universally-used ROLLING principle. They roll a short distance on *part* of a wheel, as all conveyances roll longer distances on *whole* wheels.

Deep water brings raw material inland cheaply—develops industry, enriches communities, increases rail traffic and profits.



The Universal ROLLING Principle

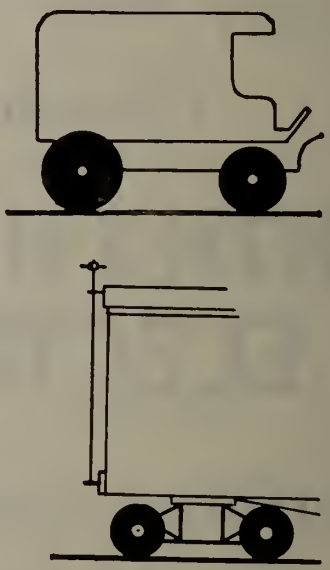


Diagram of Scherzer ROLLING Lift Bridge

Scherzer ROLLING Lift Bridges roll back while going up, allowing water traffic to pass. They roll forward and down allowing land traffic to pass. They can be operated in 30 seconds because they are so simple. They cost less to build and operate than any other movable bridges because they are so simple. There's no wear because there's no friction.

As the bridges require only part of a wheel, they avoid the *only* disadvantages of *any* rolling stock, which are the friction causing axles and journals or trunnions.

Scherzer ROLLING Lift Bridges let largest vessels pass in shortest time at least expense. They form a barrier against accidents, leave channels clear and use *no* space at sides. Scherzer ROLLING Lift Bridges need not be wastefully replaced, *but can be added to.* One man operates one or many. Send data for sketches, estimates and full information.

More than 190 Scherzer ROLLING Lift Bridges now in use in the United States, Canada, Mexico, South America, Europe, Asia and Africa. Send for list, and comparative report showing advantages over swing or high bridges, other movable bridges or tunnels.

Scherzer ROLLING Lift Bridge Co.

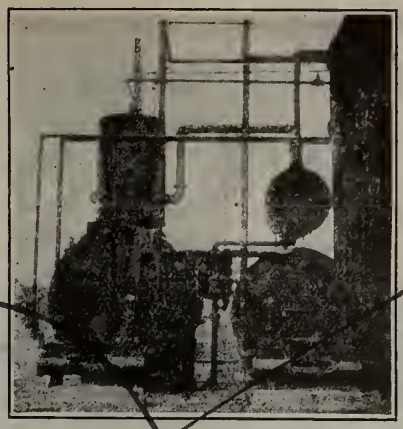
Cable Address: Scherzer-Chicago

Main Office: Monadnock Block, Chicago, U.S.A.

Eastern Office: 220 Broadway, N. Y.

"NATIONAL"

We are installers of the latest and most up-to-date Automatic Boiler Washing Plants for Railroad use.



"NATIONAL"

We are installers of all classes of heating systems in Roundhouses, Machine Shops and Industrial Plants.

The above Plant is a duplicate of one we installed in the Canadian Northern Railway Company's Roundhouse, Winnipeg, Man.

This plant handles from Twenty-four to Twenty-eight Locomotives per day.

THE GREATEST SAVER AND DIVIDEND PAYER TO THE RAILROADS.

Submit your requirements fully. It will result in your entire satisfaction.

THE NATIONAL BOILER WASHING CO., LIMITED

Imperial Bank Building, - MONTREAL, Que.

Canadian Northern Ontario Railway

Toronto - Ottawa Line

In operation to Oshawa, Bowmanville, Orono, Port Hope, Cobourg, Trenton, Belleville and Napanee

With connection at Trenton for all Points on the Central Ontario Railway, and at Napanee for Bay of Quinte Railway Points.

Through fares include bus fare and hand baggage transfer to Oshawa Town and Bowmanville Town

¶ Trains run to and from Union Station, Toronto, Union Station with Central Ontario Railway, Trenton, located in the centre of the Town.

Solid Wide Vestibuled Trains.
Parlor Car and Dining Car Service.
Toronto, Parry Sound, Sudbury and Ruel Line

Through Service to Sudbury, Sellwood and Ruel Daily, except Sunday.

Ruel is the Gateway to the Mining Camps at Shining Tree, Gowganda and other new Camps where large operations are under way.

There are many business opportunities along this line.

¶ Write for new folder showing time tables of Canadian Northern Eastern and Western Lines, with maps and full information about the Canadian Northern System, Railways, Steamships, Hotels, Express and Telegraph Service.

R. L. FAIRBAIRN, General Passenger Agent.
68 King St. East, Toronto, Ont.

CANADIAN NORTHERN STEAMSHIPS, Limited

THE ROYAL LINE

R.M.S. ROYAL EDWARD
R.M.S. ROYAL GEORGE

Montreal to Bristol (Summer)
Halifax to Bristol (Winter)

From Montreal (Wednesday)	Steamer	From Bristol (Wednesday)
Oct. 30	Royal Edward	Nov. 13
Nov. 13	Royal George	Nov. 27
From Halifax		**z From Bristol**
Nov. 27	x Royal Edward	
Dec. 11	x Royal George	Friday, Dec. 27

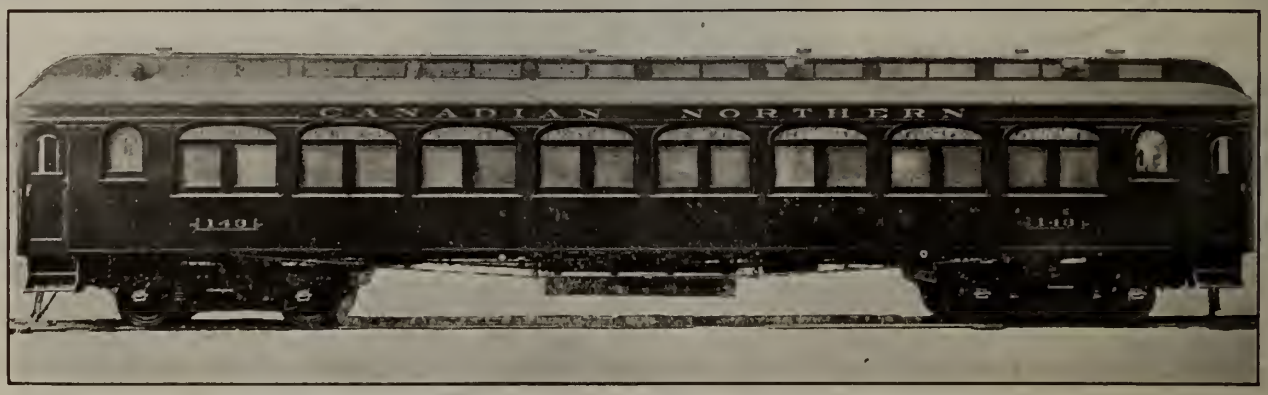
x Christmas Sailings. z Withdrawn for Annual Inspection.

For further information apply any agent, or the following General Agencies of the Company Can. Northern Building, Toronto, Ont.; 226-230 St. James St., Montreal, P.Q., 123 Hollis St., Halifax, N.S.; 272 Main St., Winnipeg, Man.

GEO. H. SHAW, General Traffic Manager, Toronto, Ont.

MODERN HIGH-CLASS

ROLLING STOCK



PASSENGER FREIGHT AND ELECTRIC RAILWAY
RUGGLES' ROTARY SNOW PLOWS
CAR CASTINGS, FORGINGS AND REPAIR PARTS

CROSSEN CAR COMPANY, LTD.

COBOURG - ONTARIO

If you have any Ballasting under consideration, we would like to talk to you about our

HART CONVERTIBLE CARS

Our Hart Cars are being used extensively by many Railroads and Contractors in Canada and they have paid for themselves many times over. If other people who use them save thousands of dollars, you cannot afford to delay, at least, a close investigation of our claims.

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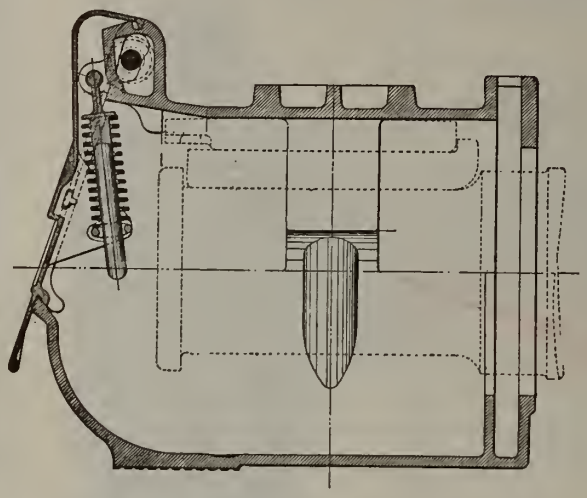

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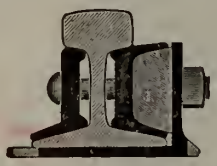
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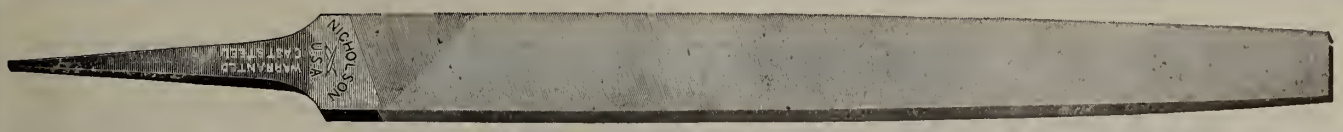

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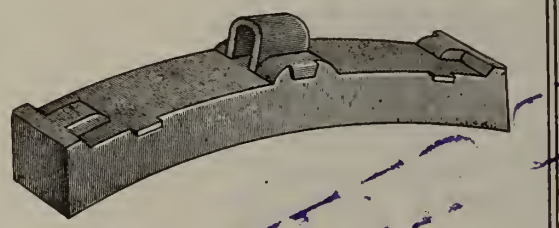

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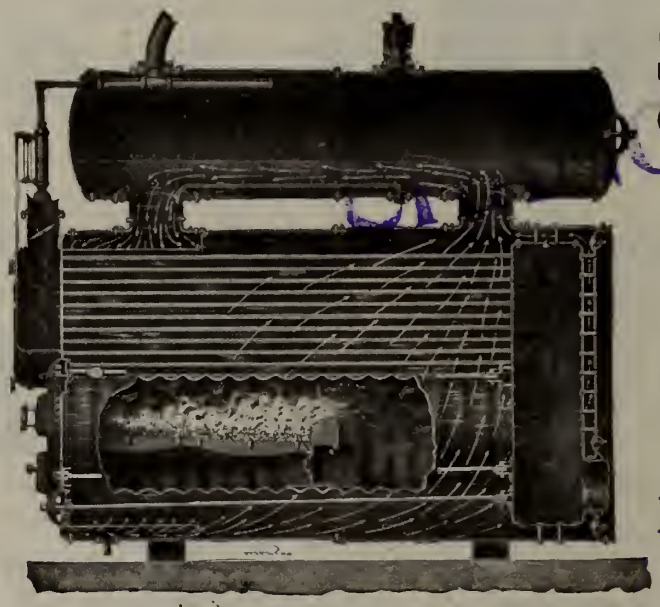

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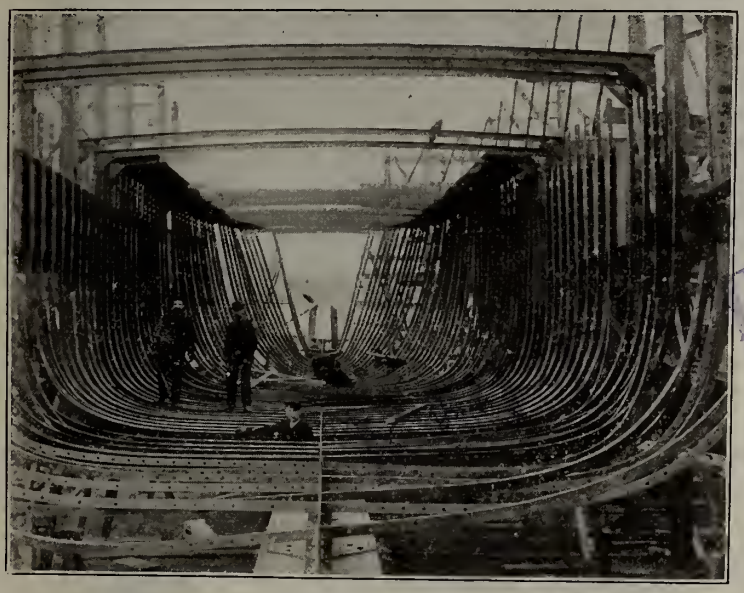

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AND ITS LESSON

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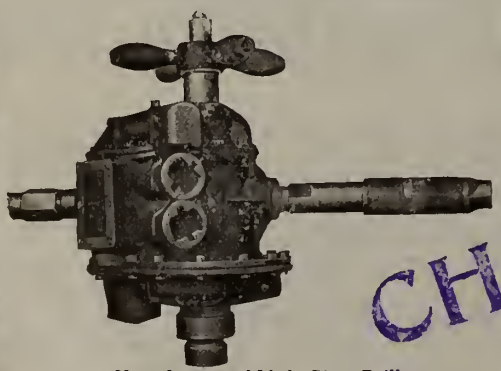

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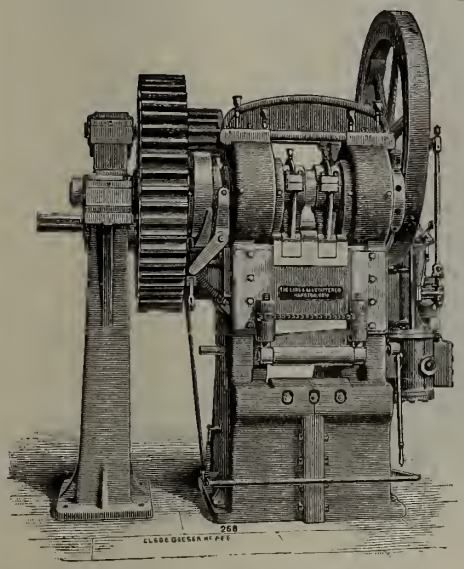

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Canadian Railway and Marine World.

December, 1912.

Canadian Northern Railway Locomotive and Car Shops at Winnipeg.

By Frederick H. Moody, B.A. Sc.

The inception and marvellous development of the Canadian Northern Ry. system within the last fifteen years is a matter familiar to all, and yet none can stop to ponder over the fact without marvelling at the stupendous character of the undertaking, and the success which has attended the development from the very beginning, due to the tireless energy of the two promoters and the able body of men they have been able to gather about them.

To meet this rapid growth the rolling stock has grown apace—in fact, at a much more rapid rate, as the volume of traffic developed has increased much more rapidly than the mileage, great as that has been—so that to-day, the number of locomotives and cars to be cared for has reached a very large number, especially when the newness of the road is considered.

For the first decade so much attention was concentrated on the extension of the railway mileage that but little thought was given to the proper handling and shopping of the rolling stock, this being kept in repair and in service in the best manner possible under the circumstances, at the terminal points and in small and inadequate shops, moderately equipped, located close to the present Winnipeg Fort Garry station.

Realizing that proper provision must be made for this very important part of a railway's many ramifications, large central shops were planned in 1908, taking concrete form in the present large and well-designed shops at Fort Rouge, a southern suburb of Winnipeg on the C.N.R. main line, which were completed in 1909. Here all the rolling stock of the lines west of Port Arthur has been shopped since that date. The layout of these shops is shown in the accompanying plan of the shop yard arrangement, fig. 1.

With characteristic foresight ample provision was made for the future extension of the various units comprising the shops; and the wisdom of that provision is, even at the present time, just three years from the time of erection, being shown, for large extensions—in some cases doubling the capacity—have been and are being made to several of the buildings. A study of the plan will show the manner in which this policy was carried out; each instance will be noted in due course as the description of the individual buildings progresses. Under the guidance of S. J. Hungerford, Superintendent of Rolling Stock, and A. H. Eager, Superintendent of Shops, with the staff of foremen, the original plans are being pushed forward and improved upon, so that the shops are now the equal of any of similar size in this country, and probably elsewhere.

The shops cover a considerable tract of ground on the main line, slightly over a mile southwest of Fort Garry station. On the north, the grounds extend from near the point where the line crosses Pembina street, to Kylemore avenue on the south, a distance of more than three-quarters of a mile, the buildings being for the most

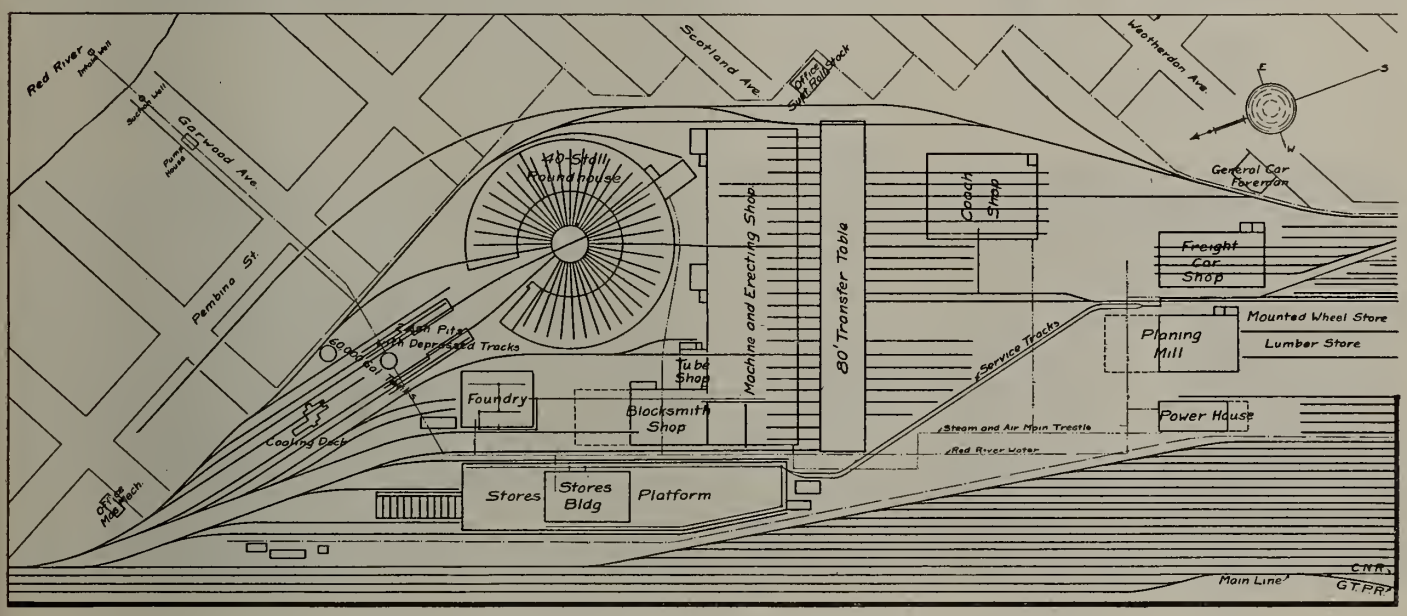


Fig. 1. Section 1.—Layout of C.N.R. Fort Rouge Shops—North End.

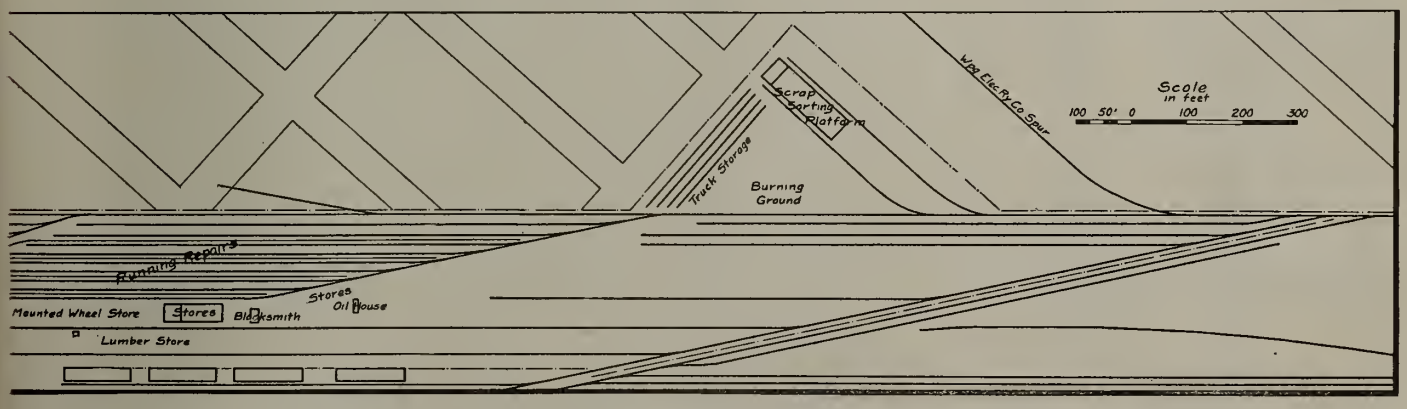


Fig. 1. Section 2.—Layout of C.N.R. Fort Rouge Shops—South End.

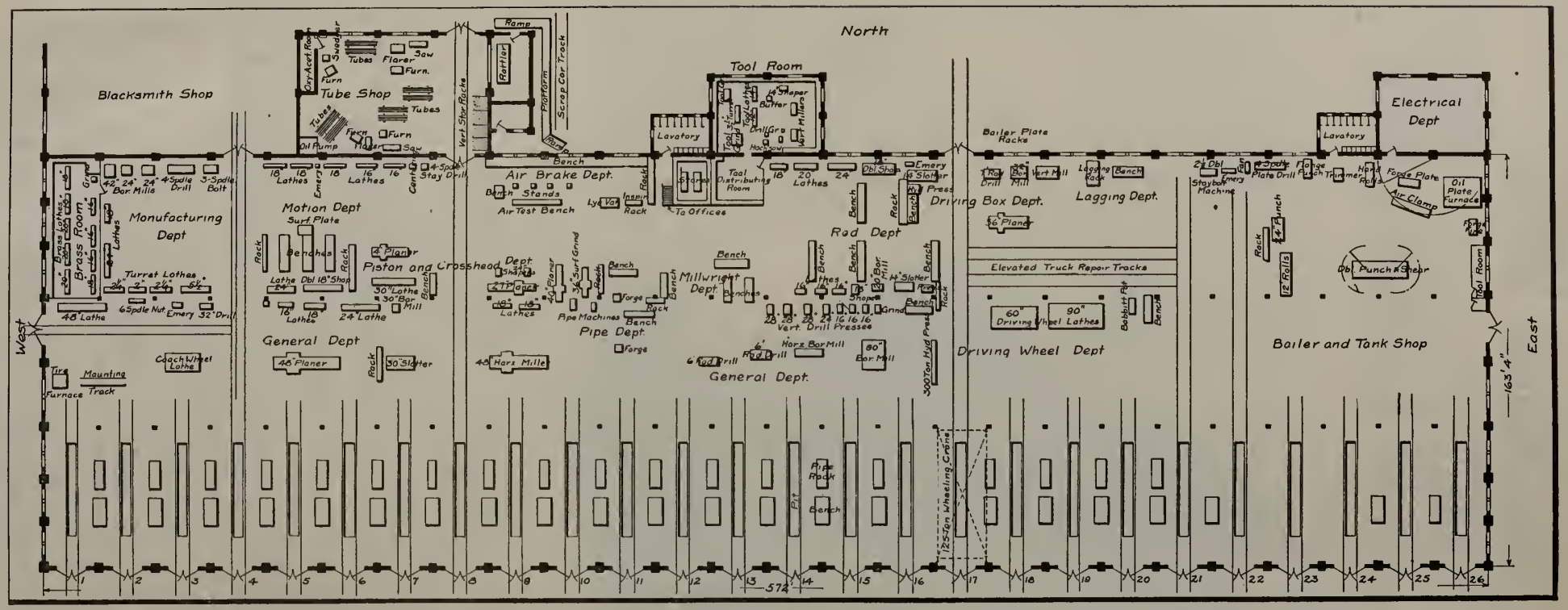


Fig. 2.—Interior Layout and Machine Tool Distribution in Machine and Erecting Shop.

part near the north end and the repair yard and rip tracks at the south end. At the widest point, across the roundhouse and machine shop, there is a width of about 800 ft., narrowing off towards each end. The office of the Superintendent of Rolling Stock is located at the foot of Scotland avenue, convenient to the buildings of both the locomotive and car departments, by which means both he and the Superintendent of Shops are constantly in touch with the work.

THE LOCOMOTIVE DEPARTMENT, D. Galloway, General Foreman, comprises all the shops handling and repairing such motive power as has been turned over by the operating department for shopping. The main buildings in the group consist of the machine and erecting shop, blacksmith shop and foundry. All the buildings have close communication with each other, the machine shop and erecting shop under one roof, the machine and blacksmith shops connected, and the foundry close in the rear of the latter, making connection in the rigorous winters to which this part of the country is subject, particularly easy.

MACHINE AND ERECTING SHOP.—These allied departments are housed in a large building of conventional design, 572 ft. by 163 ft. 4 ins., a plan of which is shown in fig. 2, and interior views from the west end in figs. 3 and 4. The shop is divided lengthwise into three bays. The south one, fig. 4, is the erecting floor, while the other two are the machine tool bays, the central one, fig. 3, for the larger machines and general departments, and the north bay for the department groups of smaller machine tools. The offices of the General Foreman, and of A. Hopkirk, Shop Engineer, and A. Hough, Foreman Machine Shop, are located a few feet above the ground, as shown to the left in fig. 5, about the centre of the light machine tool bay, in a position commanding a view of the whole shop.

The building is a brick structure, built on a concrete step footing, with a maximum width of 9½ ft. on the light tool bay side, and 8 ft. on the erecting shop side, these foundations in both cases being sunk to a depth of 6½ ft. The central bay is 51 ft. 4 ins. wide, and the outside bays each 55 ft. 4 ins., making a symmetrical construction. The roof, with a central height of about 40 ft., is carried by roof girders, spaced 22 ft. centres, down the length of the building, of a construction to be seen in figs. 3 and 4, the ends resting on abutments of the brick walls, and on steel columns along the lines of the bay divisions, these columns being built up of a plate 16 x 9-16 ins., to which are rivetted four 6 x 3½ x 9-16 in. angles. The clear height to the bottom chord of the roof trusses is 28 ft. over the whole shop. The steel columns rest on step concrete footings, 6½ ft. deep, the lower face being 8¾ ft. square. Bedded in the bottom step of the footing is a double layer, five in each, of 8 ft. lengths of old rail section, to reinforce the footing. This solid construction of foot bearings was made necessary by the nature of the ground on which the shops are built, the land being largely of a swampy nature prior to its use as a site for the shops. The surface soil is mucky, with a base of thick clay, which forms a good foundation if a wide enough bearing be obtained. Hence the large area of all the foundations. The floor is surfaced with 3 in. planks, secured to 4 x 6 in. sleepers at 4 ft. centres, bedded in a 12 in. layer of gravel.

Special provision has been made for heating. The original plans called for hot air heating, with fans located at three points along the north wall in lean-to buildings. This plan was changed to the use of steam heat. Steam at 125 lbs. pressure is brought from the power house on an elevated trestle, entering the erecting shops near the roof level at the southwest corner of the building. Here is located a large reducing valve to provide the low pressure of the heating system. Along the north wall and the two end walls, there are banked 34 coils of 2 in. pipe, in separate units between each of the windows and doors. On the south wall, where the large locomotive entry doors are located, special provision was made by increasing the banking of pipes around the buttresses to 52 coils of the same size, as shown along the right wall in fig. 4. This arrangement, with 3 or 4 lbs. of steam, has been found ample to keep the shops quite comfortable in winter, the extra coils on the south side quickly bringing the shop back to normal when locally chilled by the spotting of a locomotive on a pit.

A 6 in. main, carried alongside the steam main on the trestle, supplies air for the shop, a pipe with double connection at the

lower end being attached to each column, providing ample hose connections for all purposes. Electric power is supplied from the power house on poles above the steam and air trestle, in both direct and alternating current, the former for the individual drive and the latter for the group constant speed drive. The groups have induction motors, and the larger individual drive machines have direct current motors supplying a variable speed control in the motor itself.

The shop has large windows on all sides, which, with the 12 x 70 ft. skylights in each 22 ft. section, produces a well lighted interior. All windows are cleaned at frequent intervals, so that the light inside is but slightly less than that out of doors. Artificial illumination is obtained from Cooper-Hewitt mercury arc lights, suspended from the bottom chords of the roof trusses. Down the central bay, these are located alternately one and two per truss, with one suspended centrally from each truss in the side bays. Mercury arcs, while not providing a natural light, give a bright, penetrating illumination that is restful to the eyes, and with the close spacing provided, the shop is well lighted for all purposes.

The erecting shop contains 26 pits, approached from the south through large swing doors from an 80 ft. transfer table, electrically operated. This transfer table has a windlass with a long cable, which when passed over a sheaf in the forward end of the pit, spots the locomotive where desired. The same attachment is used for drawing the locomotive out of the shop. This reduces to a minimum the period of time necessary to keep the doors open, a most important consideration in severe weather. Locomotives to be shopped enter from the north end of the shop grounds, running on the transfer table in its easterly position over the track passing along the rear of the roundhouse. This track is a through running one, the full length of the grounds, making approach from either end equally feasible. On the south side of the transfer table, as shown in fig. 1, there are several blind storage tracks for spotting locomotives before and after shopping when conditions are such that removal is inconvenient.

The pits, 37 ft. long, are constructed of concrete, and are located slightly nearer the central bay than the south wall, leaving a wide passageway back of the locomotives along that wall. The pit bottoms slope to the south, cast iron drain pipes leading from that end, connecting with a 10 in. tile pipe which empties into the city sewer passing across the grounds in line with Scotland avenue.

Pit 17 has a stationary 125 ton locomotive wheeling crane, capable of lifting the heaviest locomotive on the system. The balance of this erecting shop bay is equipped with three 1½ ton travelling hand cranes at a rail level of 20½ ft., carried on a built up girder of 30 x ⅜ in. plate and four 6 x 3½ x ⅜ in. angles. Two of these cranes are located west, and the other east, of the wheeling crane which obstructs the passage of the hand cranes either side of that point. In addition, at each column, other than the ones on each side of the wheeling crane, there are 13 ft. jib cranes, constructed of 8 in. channels, as will be noticed on the left in fig. 4. The majority of these cranes have but recently been installed, the original shop construction only providing for one jib at every alternate post, the one crane serving two pits. Consequent delays are now overcome.

A 4 ft. suction fan is located up in a skylight over the row of columns, driven by a 15 h.p. induction motor, and connecting to a 20 in. suction pipe running the length of the shop over the columns; 14 in. pipes branch vertically downward over each pit track, the lower end carrying a telescopic smoke jack, which can be pulled down over the locomotive smoke stack for the firing up test. These jacks are counter weighted so as to slide up out of the way when not required. For the firing up test the locomotive is pinch barred forward until the smoke stack is directly under the smoke jack. The smoke drawn up by the exhaust fan is blown out through the roof, leaving the shop free from the objectionable smoke frequently found in shops where such a provision has not been made.

All but pits 20 to 26 are used for locomotive erection. The erection work is divided up into three gangs, and for each of the gangs, at a central point on one of the columns, there is mounted a steam driven water pump, consisting of a steam end of a 9½ in. air pump, to the lower end of which, in place of the air end, there is attached a 4 in. water pump with water connections therefrom. Each pit in the gang is thereby placed within convenient range of a water connection for giving the boiler a hydrostatic pressure test.

Between each pit there is a work bench, equipped with two vises, and at the north end of the bench, a double sided cast iron pipe rack for carrying the boiler fittings while dismounting. The rack is of ample size to accommodate all the fittings, leaving the floor around the pits entirely unhampered, and clear for the passage of the workmen from point to point around the locomotive.

The practice of this place, when a locomotive is shopped for heavy repairs, is to first spot the locomotive on pit 17 under the wheeling crane, where after loosening the gear and pedestal caps, the locomotive is lifted bodily. The forward end is lifted by a looped steel hawser suspended from the front hoist placed under the smokebox, and the rear end is raised by a cross bar suspended from links from the cross arm of the rear hoist placed under the rear end of the frame. The cross bar is kept near the door between pits 17 and 18, on strips of bar iron secured to the floor. Rollers are placed under the cross bar, and it is rolled across the pit tracks on the bar iron rails, the ends being there slipped into the slits in the suspended link ends. On the locomotive being raised, the drivers and truck left resting on the rail are rolled across into the centre bay, carrying their boxes. A small 4 wheel truck is run in from the rear and placed under the forward end of the frame, and a pair of mounted wheels placed under blocks of wood bearing up under the rear pedestal cap, placed back in position for this purpose. On these supporting wheels, the locomotive is lowered, run out on the transfer table, and spotted on the pit provided.

Tenders are handled on pits 20 to 26, and also on the extended ends of the through tracks 21 and 22. On these several tracks the tenders are placed by the transfer table in the same manner. The lighter repairs are handled on the pits adjoining the locomotive pits, and the heavier ones on the pits at the east end and on the north end of tracks 21 and 22, all these tracks adjoining the boiler and tank shop in the northeast corner of the building, the whole of the shop east of track 19 being occupied by the boiler and tank department. The east four sections of the central bay are the boiler erection floor, fig. 6, where the boilers are handled when requiring heavy repairs.

This department is well equipped for a shop of the size, and has even built boilers complete when required. Near the corner, butting up against the end wall, there is an oil operated furnace about 12 ft. square, of a size designed to handle standard boiler plates. To the left front of the furnace there is a 12 ft. air operated flanging clamp, and between it and the wall is located a large flanging plate. An open forge fire for flange work adjoins the oil furnace along the wall. This battery of flanging equipment is provided with a 22 ft. jib crane swinging from the first wall buttress. The open space in front of this group is the lay off floor.

Alongside the centre bay columns, and to the south of the lay off floor, there is a double punch and shear with a 40 in. throat gap. Each one of the pair is equipped with a 10 ft. jib pivotted centrally on the top

Fig. 3.—Central Bay of Machine Shop, Looking East.

Fig. 4.—Erecting Shop Bay, Looking East.

of the frame, for the handling of the stock while being worked. Powerful 12 ft. plate rolls, capable of handling the heaviest boiler plate, face the lay out floor on the west. The vertical movement of the upper roll is power operated through a 15 h.p. d.c. motor, and the rolling, through a 25 h.p. d.c. motor. Alongside is a 24 in. gap punch driven by a 15 h.p. d.c. motor, the plate for which is handled by an 8 ft. jib. To the rear of this machine and the rolls, and adjoining the through tender tracks, there is a tender storage rack for the convenient location of such tender parts as coiled springs, truck columns, etc.

Along the north wall from the east are 8 ft. hand rolls, a plate trimmer with 10 in. circular shears and a horizontal flange punch driven by a 15 h.p. d.c. motor and equipped with a 15 ft. jib. Adjoining, in a 15 h.p. group drive, there is a 4 spindle plate drill, a 3½ ft. fan for the flange fire, a double 18 in. emery, and a double 2½ in. staybolt threader, completing the equipment of the boiler and tank departments, with the exception of a small forge fire between pits 23 and 24 on the other side of the shop.

Fig. 5.—Rod Department and Tool Distributing Room.

Fig. 6.—Boiler and Tank Shop Floor.

The tool room for the local supply of air hammers, snaps, beading tools, and all tools required for boiler work, is located against the east wall, beside the big end door. The foreman's office adjoins.

Both locomotive and tender trucks are handled on the two longtitudinal tracks, fig. 7, just north of the line of columns separating the main and north bays. These truck tracks extend from the through track of 21 to the through track of 17, the tender trucks being handled from track 21 to the cross tracks, and the locomotive trucks from track 17. A 25 ft. section of the truck tracks in section 19 is elevated on 18 in. pedestals, for the more convenient approach of mechanics repairing it or dismounting the parts.

To the north of the truck repair tracks, along the wall, is the lagging department, with flat topped sheet working table, and a lagging rack adjoining.

As before mentioned, the driving wheels from the wheeling pit are run across into the main bay. From here, they take either one of two courses, depending on whether retiring or only returning is necessary. If tiring is necessitated, the wheels are run straight across into the north bay, where the several pairs of wheels are mounted in a row on trestles over the through tracks, and the worn out tires removed by heating with a band pipe in the conventional manner. In this position, new tires are mounted by the same means, the wheels then retracing their steps to the central bay, from which point the steps are the same as for wheels that only require returning.

The wheels are picked up by the central crane and placed in a row, fig. 8, in the direction of the shop length, on the driving wheel floor, which adjoins the through track immediately to the east. The first step is the removal of the driving boxes, and after cleaning, their disposition in the driving box department for renewal and repair. The wheels are then in turn placed in the 90 in. driving wheel lathe for the turning, from which on completion they are removed and placed on end on supports for the pouring of new babbitt thrust bearings, which are renewed on both ends of a pair, the babbitting department for all work being located close at hand to the east of the driving wheel lathes. They are then mounted in the 60 in. driving wheel lathe, where the journals and thrust bearings are trued down. This completed, the set of wheels is mounted in a row across the central bay against the through tender track of section 21, where planks are mounted on low trestles, as in fig. 8, under each journal, at a convenient height for the slipping on of the driving wheel brasses for fitting, these having at this stage arrived from the driving box department. On completion of the fitting, the boxes are mounted on the journals, and the finished wheels set to one side on the wheel floor for the rewheeling of the locomotive under the wheeling crane by a reversal of the former procedure.

Immediately to the west of the wheeling track there is a 300 ton hydraulic press for mounting or removing crank pins and axles when these operations are required. Behind this press is located a 90 in. boring mill, used for the most part on driving wheel work, boring and turning wheels and tires.

The driving box department is located on each side of the north door of the through driving wheel track. In this department, from west to east, there are an hydraulic press, 14 in. slotter with 6 ft. jib attached,

Fig. 7.—Locomotive and Tender Truck Department.

Fig. 8.—Driving Wheel Department.

7 ft. radial drill, 32 in. boring mill, vertical miller with 10 ft. jib and a 36 in. planer with 8 ft. jib. The first two are on the end of the side rod group drive, the drill, boring mill and vertical miller on a 15 h.p. group drive, and the planer on an individual 10 h.p. drive.

The driving boxes as removed from the wheels on the driving wheel floor, are there cleaned and then trucked to the hydraulic press, where the brasses are forced out. New brasses are machined on the 14 in. slotter to fit and then removed to the press for forcing into place. These two machines, it will be noticed, are adja-

cent to each other. The assembled box is then moved over to the 7 ft. radial drill, for the drilling of oil and plug holes, the plugs being here fitted. Passing on to the vertical miller, the brass is bored out to fit the journal, the box being then ready for the 3 ft. planer, where the sboe and wedge fits are planed. The boxes thus make a belt line, entering the west end of the department and working around to the east, and then back to the driving wheel department for mounting.

The rod department, fig. 5, is located directly to the west of the driving wheel department, and contains an hydraulic press, 14 in. slotter, 20 in. boring mill, 18 in. shaper, 18 in. emery, 18 in. double rod shaper, and a 24, 20 and an 18 in. engine lathe in the distribution shown in figs. 2 and 5. The wall group is on a group drive. With a passage in the centre of the bay through the department, there are three vise benches, two north and one south of the passage. Between these benches, parallel to the passage so that the ends are near the benches, the rods are mounted on low trestles in a convenient position for fitting.

The rods as they come initially from the wheeling crane pit, which it will be noted, is conveniently located to the rod department by means of the cross track, where they are removed from the locomotive, have the brasses removed under the hydraulic press, and then passed on for further fitting. The 20 in. boring mill is employed principally in boring brasses, and the 18 in. shaper in surfacing them. The 18 in. shaper along the row of columns is used in making shims, pads, etc. The other machine tool equipment is used for miscellaneous rod work.

The group of four benches in sections 12 and 13 of the north bay is for the millwrights and carpenters, where all the repairs to cabs, running boards and pilots are made.

Next adjoining this department, in section 11 and extending out into the centre bay, is the pipe fitters' department. This is equipped with two power pipe machines, two small open forges for copper pipe and other bent work, work benches fitted with ordinary and pipe vises, and a pipe rack at the west side, facing the central bay. For bending pipe, there is a lead lined block mounted on a pedestal in the floor.

About the centre of the north wall, in the background of fig. 5, are located the tool distributing and the petty stores rooms, over which are the offices of the shop officials as mentioned before, commanding a view of the whole shop. The petty stores room contains such minor stores as are in constant demand in the shop, and is well arranged with pockets on the rear and side walls, and in a central rack, providing for the accommodation of a wide range of stores. The tool distributing room will be described later, in connection with the tool room itself.

The air brake department, fig. 9, occupies the north wall in the next three sections. At the east end of the department are two racks for the accommodation of air brake fittings and inspirators, lubricators and parts, all of which are here repaired. In the main part of the air brake department (left foreground in fig. 9), there is a lye vat, steam heated, for the complete immersion of greasy compressors or their parts.

Parallel with the wall bench are four pedestals carrying a face plate, free to revolve in a vertical plane. To these face plates, compressors are secured, the revolving feature making all parts equally accessible to the mechanic. The bench to the south of these stands carries an air brake testing outfit, and at one end, a guage tester. The end of the air brake department adjoining the door is set apart for the repair of water pumps, for the most part gasoline, which are sent in from all parts of the system.

The piston and crosshead department, left background in fig. 9, occupies that portion of the shop in sections 6 to 9, alongside the row of columns. It contains a 30 in. engine lathe with 10 h.p. drive, operating steadily on piston rods; a 4 ft. planer for crossheads, but also planing slippers, balance plates, steam chest covers and similar work; and a 30 in. boring mill for piston heads and cylinder covers. Adjoining a column, there is a bench for fitting, and attached to the column there is a jig for the mounting of pistons and piston rods, and holding them securely together while the piston rod nut is being tightened on. The crosshead work is handled across the through track in section 18, where there is a 27 in. and a 40 in. planer and two 24 in. shapers. It will be noted that the piston and crosshead department is almost centrally opposite the erecting shop, where the pistons and crossheads are removed from the locomotives, as against the removal of the rods under the wheeling crane.

All of sections 4 and 5, in the north bay, parts, that are used in quantities, in batches are occupied by the motion department. Nearly all the machinery here is small, for most of the motion work is of a light nature. All the motion work is made or repaired here with the exception of the eccentric sheaves and straps, which are produced in the 32 in. boring mill in the driving box department, and the surface grinding on the 36 in. surface grinder to the east of the piston and crosshead department. From east to west on the wall, as in fig. 10, are the following machines:—4 spindle vertical staybolt drill, lathe centering machine, two 16 in. lathes, 18 in. lathe, 16 in. grinder and two 18 in. lathes, all on a 15 h.p. group drive. In the same department, along the line of columns, there is a double 18 in. shaper, 24 in. lathe and a radius link grinder attached to the centre bay side of a column. The centre of the department contains three vise benches, with a surface plate at the end of the centre one. Beyond the east bench is a rack for carrying such motion work parts as motion pins, valve glands, cups, springs, etc.

The manufacturing department occupies that portion of the north bay to the west of the through track in section 4, up to the last section which is partitioned off by a screen for the brass department. It is the practice in these shops to make standard and have them stocked for the general stores department, drawing from there for all parts of the system as well as for the local shop when required. It is in this department, called the manufacturing department, that all stock work is made up.

In the north west corner of the department, there are three vertical boring mills; the first, a 42 in., works steadily on piston and valve rings; the second, a 24 in., on motion work such as valve bushings, etc.; the third, a 24 in., on general stock work. Adjoining, there is a 4 spindle drill, used for the most part in drilling coupler pockets, arch bars and similar bulldozer forgings. Alongside this, there is a 3 spindle 2 in. bolt machine for rough stock bolts. These last two machines are close to the blacksmith shop door, from which the stock to be worked is received. These machines are on a 20 h.p. group drive. Along the brass room wall are two lathes, one 18 in., and the other 24 in., for general stock work.

To the north of the columns, there is a battery of four turret lathes for the stock production of bolts, studs, pins, hexagon head bolts, etc. This battery contains a 2 in., two 2¼ in., and a 5¾ in. machines. The latter is for use on larger stock such as wrist pins, crank pins, knuckle pins and brake hanger pins. To the south of the row of columns and in the same department are a 32 in. drill, double 18 in. emery wheels and a 6 spindle nut tapper, these together with the turrets being on a 35 h.p. group drive.

All the machine tools in the central bay, fig. 3, other than the ones especially excepted in the foregoing, are in what is usually termed the general department, where all work that cannot be well classified into various departments is handled. From the driving wheel department adjoining the tender shop west ward, there are the following machines in groups and singly: Grindstone, three 16 in. vertical

Fig. 9.—Air Brake Department; Piston Department on Left.

Fig. 10.—Part of Motion Work Department.

drills, three 16 in. lathes, a 24 in. vertical drill, and three 28 in. vertical drills, all on a 20 h.p. group drive; medium sized horizontal boring mill with 3¼ h.p. drive; two 6 ft. radial drills; 48 in. horizontal rod milling machine for side and main rods, keyways, and sometimes shoes and wedges; two 18 in. lathes, 18 in. emery, 30 in. slotter with 13 h.p. motor; 48 in. planer with 15 h.p. motor (has shoe rack to the rear of slotter with classified shelves with numbers and classes of locomotives marked thereon); 24 in. lathe, 18 in. lathe, and 16 in. lathe; coach wheel lathe; and 48 in. lathe.

The tender wheels are handled at the west end of the centre bay, to the west of the coach wheel lathe, where the tires are turned. An oil furnace, built up of fire brick, has been constructed at the wall for the heating of the tires in batches of six. Leading down the shop, from this furnace are a couple of elevated tracks at a level of about 2 ft. above the ground and about 4 ft. apart. The axles rest on these rails, with the ends projecting beyond the rail on each side, the heated tire being slipped over the supported wheel centres from each end. The open space each side of the wheel tracks provides wheel storage. The wheels to be turned enter from the end door and are mounted in the coach wheel lathe, turned and then run further on into the shop, where the crane picks them up and carries them to the tender department at the opposite end of the shop.

The brass room, fig. 11, is the screened off section at the west end of the north bay. Along the wall, there is a work bench, with two rows of machines paralleling the wall. The south machine of the west row is a 20 in. turret; the next two, 20 in. brass lathes, and the remaining six all 16 in. brass lathes. There is also a 16 in. emery beside the brass room door. These machines are all on a 10 h.p. motor group drive.

The tool room, fig. 12, J. A. Wright, Foreman, is located in a lean-to building, 44 by 31½ ft. wide, on the north side of the building near the centre. It is well equipped with a line of light machine tools, putting the shop in a position to handle a wide range of tools, both in the making and repairing. Between the tool distributing room and the tool room itself, there is an archway, about two-thirds of which has been built up with shelving, open from both sides for the storage of all sizes and shapes of lathe and planer tools. A large stock of all sizes and shapes of tools is here stored and classified according to size and shapes on the different shelves. Inside the entrance way and back of this series of shelves (left background in fig. 12) is located a no. 1 Sellers tool grinder, where an operator is constantly employed keeping the tools in shape. The shelves, being open on both sides, are equally accessible to the operator and tool room attendant. At the side of the tool grinder, there is a board of sample tools for the guidance of the operator.

Further along the west wall, there is a 3½ in. turret lathe, followed by a no. 2 B. & S. tool grinder with a 12 in. swing. It is used for grinding taps, reamers, special tools, and air motor and hammer parts. Back of these two machines are two tool lathes, a 12 in. and a 14 in., employed principally on such work as special taps and reamers. All these machines are on a 15 h.p. group drive through jack shafts attached to the ceiling.

Next to the machine shop wall is a small power hack saw, with a patent drill grinder alongside. On the opposite side of the room is a general service double grinder and buffer. Back of this is located a 14 in. shaper, and alongside a large vertical miller for heavy tool work, and a second miller of smaller size for small tool work.

The bench in the southeast corner is used for air motor and hammer repairs, and on a rack on the south wall is carried a full line of these parts. A similar rack carrying threading machine dies for all the different makes in use but one, adjoins this last rack. A full line of tool milling cutters is carried on a board attached to the east wall, close to the two millers.

The range of tool work undertaken is extensive, including not only the threading dies mentioned, but also special taps, standard taps for hurry-up jobs, special hobs, punches and dies, boiler tools, boiler snaps, drill, sockets, ratchets, jigs of all kinds, some motor and air hammer parts, and a wide range of special tools.

The tool-distributing room (background in fig. 5) is entered from the east side, with the delivery counter along the south side. Planer and lathe tools are kept in the rack to the rear, large and special reamers in shelves along the west wall, fine reamers and taps in drawers under the delivery counter. Air hose in rolls is stored on shelves in the door corner, and in the centre are kept the machine oil tanks with the waste boxes behind. Here are also stored the portable gas tanks and torches, the whole room being well arranged for the quick distribution of the tools, delivered on the usual check system.

The tube shop is housed in a building 75 by 45 ft., adjoining the machine shop to the north. In a lean to structure on the east of this building, the tube rattler is housed, the driving motor being situated in the divided off south end of the room, entered from the outside, freeing the motor from the injurious dust of the rattler. The tubes, as removed from the boilers on the erecting shop pits, are placed in trucks in the main bay of the machine shop, the whole truck being then picked up by the travelling crane and carried down the shop to the track that runs across the machine shop into the tube shop. The tubes are either stored on end in the racks on the east wall of the tube shop just inside the door of the shop, until required, or if the rattler is ready, they are pushed along on the truck and spotted opposite the rattler, into which they are dropped through a slit in the side of the wall about 6 ft. above the ground. After the necessary rattling, they are dropped out through a lower slit on the tube shop floor, from which position they are picked up and piled on trestles in the middle of the floor to the west of the through track. They are then heated in the oil furnace adjoining, and the heated bad end sawed off in the hot saw along the north wall, the end being flared in the same heat by an air operated press alongside. Each tube, on the completion of these two operations, is piled on trestles to the west of this last machine, the ends lying in the same direction as before.

From a pile of safe ends along the west wall, one is slipped into the flared end of the tube, and the two parts heated in the oil furnace adjoining, followed by welding together in the rotary swedging machine alongside. On the completion of this operation, the tubes are piled on trestles to the south of this point, at an angle to the southwest corner.

Here the safe ends are again heated in an oil furnace, and that end drawn down in an air operated machine, the tubes then passing on to the trestle pile to the east, the flared ends pointing in that direction. The opposite end is then heated in the fourth oil furnace, and the tube sawed off to length in the hot saw adjoining. The tubes thus completed are stacked on end in the vertical racks in the corner, ready for removal to the erecting shop. It will be noticed that the tubes follow a continuous forward path without a single retrograde movement.

Along the side of the rattler room, there is a track on which two flat cars are kept spotted. Between the wall and the cars, there is a platform at the car level, approached by a ramp from the tube shop door. One car is for the reception of ashes, etc., and the other for the sawed off bad ends, simplifying the removal of these waste products, as produced, to the ash pile and scrap bins, the shop being almost automatically kept free of all unnecessary encumbrances. On both sides of the through tube shop track, in the yard beyond, there are storage piles of new tubes.

A concrete pit in the southeast corner of the tube shop, from which it is railed

Fig. 11.—Brass Room Lathes.

Fig. 12.—Tool Room Arrangement.

off, contains a vacuum pump for taking care of the water returns from the heating system of the machine and adjacent shops, the hot water instead of discharging into the sewers, being pumped to the round-house nearby for boiler filling, an economical innovation. On a ledge in the same pit, there is a 4 x 4 x4 in. oil pump for handling the oil system of the locomotive shops. At present, there are a couple of tubular tanks to the north of the tube shop for the oil storage, but these are being replaced by two 10,000 gal. tanks to be located away from the building on concrete foundations. The oil from the tank cars is discharged into these tanks, draining from the latter to the pump. This in turn forces the oil to small storage tanks at various points in the buildings. One is located in the northwest corner of the machine shop, for the boiler plate furnace, another in the tube shop for the four furnaces there, and a third in the blacksmith shop for the furnaces in that department.

The oxy acetylene plant is also located in the tube shop, in a small room in the northwest corner. Acetylene is generated at the Fort Garry station for train lighting purposes, and to save a duplication of plants, 12 gas tanks are employed for the transportation of the gas in bulk from the station for shop use, the gas being delivered in pressure tanks 15 ins. in diameter by 4 ft. long at a pressure of about 150 lbs. Oxygen is generated in the room in a small heated retort containing potash and manganese, the oxygen passing through three cleansing barrels, the first and last of which contain water and the intermediate one caustic soda, before entering a gas tank 4 ft. in diameter by 6 ft. high. From this, the oxygen is drawn off into a 4¾ x 2¼ x 5 in. compressor, delivering the gas into gas tanks, of which there are six, at a pressure of 300 lbs. These several tanks with torches, etc., comprise the portable oxy acetylene welding outfit.

The electrical department is housed in a small building adjoining the northeast corner of the machine shop. The equipment is small, comprising principally a couple of winding machines for the repair of motors. All the electrical shop equipment is cared for in this department, necessary repair parts being also stored here in a small store room set aside for the purpose.

The principal part of the machine and erecting shop equipment was furnished by the following firms:—Jno. Bertram and Sons Co., Dundas, Ont.; Canada Machinery Corporation, Galt, Ont.; Geo. Richards and Co., Manchester, Eng.; Prentiss Tool and Supply Co., New York; F. E. Reed Co., Worcester, Mass.; Wm. Sellers and Co., Philadelphia, Pa.; Alf. Herbert, Ltd., Coventry, Eng.; Brown and Sharpe Co., Providence, R.I.; Pratt and Whitney Co., of Canada, Dundas, Ont.; Quincy, Manchester and Sargent Co., New York; W. P. Davis Machine Co., Rochester, N.Y.; R. K. Le Blond Machine Tool Co., Cincinnati, O.; Flather and Co., Nashua, N.H.; Westinghouse Air Brake Co., Pittsburgh, Pa.; Springfield Mfg. Co., Bridgeport, Conn.; C. Redman and Sons, Halifax, Eng.; Lodge and Shipley Machine Tool Co., Cincinnati, O.; Foote-Burt Co., Cleveland, O.; Diamond Machine Co., Providence, R.I.; Bullard Machine Tool Co., Bridgeport, Conn.; Niles-Bement-Pond Co., New York; Gisholt Machine Co., Madison, Wis.; Warner and Swasey Co., Cleveland, O.; Dreses Machine Tool Co., Cincinnati, O.; Stevens Co., Galt, Ont.; Jones and Lamson Machine Co., Springfield, Vt.; Acme Machinery Co., Cleveland, O.; H. G. Hammett, Troy, N.Y.; R. McDougall Co., Galt, Ont.; Loew Mfg. Co., Cleveland, O.; F. Pratt and Co., Halifax, Eng.; Baush Machine Tool Co., Springfield, Mass.; Sibley Machine Tool Co., South Bend, Ind.; Francis Hyde and Sons, Montreal.; and Whiting Foundry Supply Co., Chicago, Ill.

THE BLACKSMITH SHOP, fig. 13, J. Kiepler, Foreman, is a structure 144 by 100 ft., similar in design to the machine and erecting shop, with similar methods of lighting and heating, forming a 3 bay wing running north from the west end of the machine shop, with which it communicates through a swing door in the east bay, a standard gauge track passing from the machine shop into the blacksmith shop a few feet, with a through service track the length of the blacksmith shop, and extending about half way across the machine shop, for the movement of forgings to the latter shop for finishing The bays are each 33 ft. 4 ins. wide, the walls resting on 4 ft. 8 in. wide footings at a depth of 6 ft. The columns, built up of two 8 in. channels and two 10 x ¼ in. plates, are carried on 5 ft. square concrete footings at a similar depth. The roof is carried on 20 in. I beams, with a clear height at the sides of 20 ft. Each shop. A double connection for the steam hammer exhaust exists. Normally, the exhaust is direct to the sewer, but in winter, the other connection draws the exhaust steam off into the heating system, supplementing the supply from the reducing valve, effecting a considerable saving.

Along the east wall (left side of fig. 14), there is a row of nine 3½ ft. diameter and 26 ins. high open forges, each supplied with a small anvil and employed on small general smith work. Down the centre of the shop, there is also a double row of 11 similar open forges, equipped in the same manner and operating on the same class of work. Both the pressure and exhaust fans for all the open forges, driven by a 75 h.p. motor, are located in the upper story of a small room in the northeast corner of the shop. The pressure is obtained from a 3½ ft. centrifugal fan with a 15 in. delivery pipe running down under the ground, branches running along the rear of each row of forges with a 3 in. delivery pipe to each. Each forge has a cone hood with an 8 in. suction

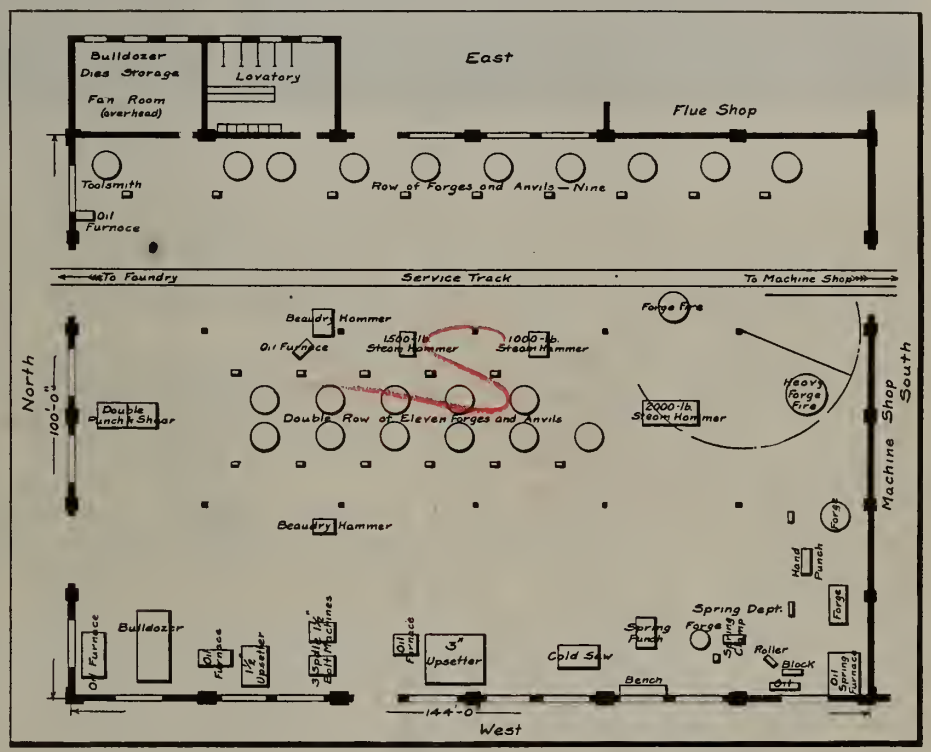


Fig. 13.—Interior Layout and Machine Distribution in Blacksmith Shop.

section has a 48 x 12 ft. skylight. The floor is of cinder.

The heaviest forging work is handled just inside the blacksmith shop, to the west of the machine shop door, shown in the background of fig. 14, an 18 ft. jib from the first column handling such heavy work as frames, etc., between a large open forge fire and a 2,000 lb. hammer. In the next section west, alongside the service track, there is another open forge fire to serve a 1,000 lb. steam hammer in the next section for lighter forgings. A 1,500 lb. hammer in the next section is used for general forge work. A steam pipe from an elbow at the heating system reducing valve in the roof of the southwest corner of the machine shop, connects with a receiver in the blacksmith shop, from which the steam hammer supply is drawn, the supply being steadier than if drawn directly from the main. Trouble from condensation in the pipes affecting the operation of the steam hammers is also reduced, a steam trap being attached to the lower end of the receiver, the drip being drawn off to the vacuum pump in the southwest corner of the tube pipe leading up to a common suction pipe over each row in the roof trusses, enlarging to a 4 ft. diameter on entering an 8 ft. exhaust fan in the fan room, the fan discharging through the roof. The shop is thus kept remarkably free from smoke. The forge coal is stored in bins paralleling the shop on the east side, approached from the shop through the door on the east side. The coal is unloaded from a track running alongside.

In the fan room corner of the shop, there is a small forge fire for the tool blacksmith, with a small oil furnace to one side for tool tempering.

To the east of the double row of forges, there is a no. 6 Beaudry hammer, provided with a 4 ft. wide oil furnace, used principally on general car work.

In the centre of the north end, a double punch and shear with a capacity for 6 x 2 in. stock, is used for general blacksmith stock work, principally on cutting up bolt stock, and cutting up bolts that are made double ended in the upsetting machine for convenience in handling.

Bulldozer work is handled in the north-

west corner, where there is located a 20 in. stroke bulldozer having a ram 6 ft. wide and 1 ft. deep. This has an oil furnace 9 ft. wide and 3 ft. deep, butting on the end wall. The numerous bulldozer forms are stored in the ground floor room of the fan building. Adjoining the bulldozer, there is a 1½ in. upsetting machine to the right in fig. 15 with an oil furnace similar to that for the bulldozer. This upsetter is employed steadily on bolt and nut work, principally for stock, and has a normal capacity of 6,000 ¾ in. bolts in a 9 hour day. Alongside of this, for convenience in the final handling of the bolts here produced, are two 3 spindle 1½ in. threading machines. Opposite this, there is located a no. 8 Beaudry hammer for general car work.

Heavy upsetting work is handled in the heavy upsetting machine to the south of the doorway opening, alongside of which there is an oil furnace of similar size to the last two. A wide range of dies has been made for this machine, some heavy and intricate forgings being produced in the ordinary course of work. The regular run of work includes large bolts, cotter bolts, eye bolts, grab irons, etc. Adjoining this machine is located a cold cutoff saw, 30 ins. diameter, for general work.

The balance of this part of the shop is given over to spring work. The equipment includes a special spring punch, cutting and punching spring leaves up to 6 x ½ in.; a hand-operated clamp for fitting on the spring buckle; a spring roller with air-operated clamping mechanism, shortly to be replaced by a machine that not only clamps down the upper roll by air, but will also turn the upper roll, passing the spring leaf through; a spring leaf surface block; a spring leaf oil bath; and a spring oil furnace in the corner. This equipment is shortly to be supplemented by a buckle press. Adjoining the spring furnace, there is a small open forge with anvil for general spring work. There is also a small hand punch. This department has a capacity on the average of ten 14 leaf springs of 5 x 7-16 in. stock per day.

The oil for this shop is stored in a tank located in a central skylight, from which it feeds by gravity to the several oil furnaces.

The present capacity of the blacksmith shop has become taxed to such an extent that a 4 section addition to the north of the building is being erected, increasing the shop length by 96 ft., all as shown by the dotted lines to the north in the plan, fig. 1.

The end wall has been knocked out to make the shop open throughout. The machine and forge arrangements will be altered by this addition, but the general disposition will be along the order of the plan as at present in use.

The equipment of the blacksmith shop was furnished by the following firms:—Jno. Bertram and Sons Co., Dundas, Ont.; Bell, Buffalo, N.Y.; Beaudry and Co., Boston, Mass.; Acme Machinery Co., Cleveland, O.; Clifton-Waddell, Johnstone, Scotland; Jno. Evans, Philadelphia, Pa.

THE FOUNDRY, A. Knight, Foreman, is located in a building 129¾ by 100 ft., directly to the north of the blacksmith shop, as shown in fig. 1, and resembles in general design both that shop and the machine shop, being of brick construction with three bays, the central bay being 39 ft. 6 ins. wide, and the two side ones each 28 ft. 8½ ins. wide, the roof trusses being supported by steel columns between the bays at 16 ft. intervals.

It has been designed with a view to the future, for the proportions are such that it will be amply large enough for the handling of locomotive and car repair work for some years to come.

Fig. 14.—East Side of Blacksmith Shop, Looking South.

Fig. 15.—West Side of Blacksmith Shop, Looking South.

convenience, the balance being permanently stored in the stores building.

Along the east wall, in the northeast corner of the building, are located the moulding machines for the stock production of parts required in large numbers. In the same row are three match plate moulding tables, where a large portion of the duplicate moulding work is handled. Another table to the south of the lavatory is employed on general work.

In the east bay, it will be noticed that there is an industrial track for the handling of flasks, sand, patterns, etc., connecting at the centre with a similar track down the west side of the centre bay, through a central cross track, with turntables at each end.

Occupying the two central sections of the west bay, the cupola is located in a large room, designed for the accommodation of a second cupola, which may possibly be installed at a future date. The present cupola is 46 ins. diameter, with a capacity of about 6 tons. The clear ground space in the cupola room provides ample space for the cupola room attendant in his work of lining the ladles and crucibles. The cupola tap is into the central bay, pouring on a line over the top of the service track along that wall. Ladles up to 4 tons capacity are in use, although the larger size castings

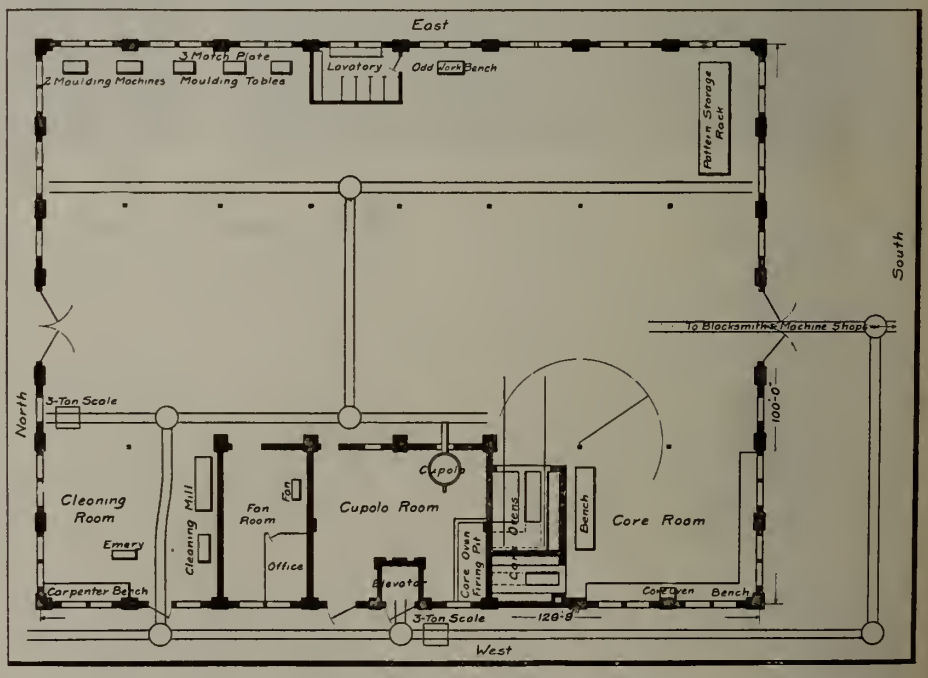


Fig. 16.—Interior Layout and Arrangement of Foundry.

The central and east bays form the large moulding floor, this space being practically clear except for the lavatory similar to the ones in the other shops, in the third section from the north on the east side, and a pattern storage rack filling the whole end section in the southeast corner of the building. In this rack, all patterns in more or less constant use are stored for the sake of

made here rarely require more than the ½ and 1½ ton sizes. While in many cases the industrial track would be found of great service, it has been found that under ordinary circumstances the 10 ton electric crane down the centre bay is more useful in the handling of the ladles to and from the moulds, more especially as all the heavy work is handled in the central bay, and the light or hand ladle work in the east bay. In consequence, the service track in the building has fallen in disuse.

An air-operated elevator to the cupola charging floor, opens to the outside in the west wall, and is served by a service track along that wall. Parallel with the service track, there is a standard gauge track, as may be noticed in fig. 1, on which the scrap and pig iron is brought in car lots and piled on the ground on the side opposite to the foundry, from which it is drawn as required, and either run on the elevator in the small service cars, or what is more generally done, on wheelbarrows. Scrap iron is used for the most part, with an addition of from 10% to 20% of pig, depending on the class of work for which the casting is being made.

A small room adjoining the cupola room to the north contains the cupola fan, and the foreman's office in the southwest corner. In the section to the south of the cupola room there are two core drying ovens, both fired from a pit in that corner of the cupola room. The larger one opens to the centre bay, and has a 7 ft. gauge car running out into that bay for the reception of the larger cores. It is served by a 15 ft. jib crane, swinging from an adjoining column. To the rear of this oven, opening to the south, is located the smaller oven, with shelves ranged along both sides for cores of smaller size.

The core room occupies the south two sections of the west bay, and is equipped with a vibratory sand sifter and a small core machine. The sides are lined with core benches, and behind the north bench there is a small core rack. For the baking of these small cores for bolt holes, etc., there is a small oven on the east wall. With the exception of this part of the foundry, which is paved with concrete, the floor is of the usual moulding sand formation.

The casting cleaning room is the northwest corner of the building, and contains a large and small tumbling mill, as well as benches for the chipping of the larger castings. There is also a double 18-in. emery wheel for cleaning room purposes. The west wall of this room is set aside for the foundry carpenters. A service track runs across this room, connecting at the ends through turntables with the inside and outside systems of trackage.

Coke and core and moulding sands are stored in a corrugated metal building, 100 by 30 ft., to the north of the foundry, as noted in fig. 1. This is divided into three rooms, 50, 25 and 25 ft. in length, holding respectively coke, core sand and moulding sand. These supplies are drawn off from the west side of the building.

A yard track approaches the central doors on the north of the building, and on this track, close to the building, a flat car is kept spotted, as at the tube shop door, for the loading of the slag and clinker directly on removal from the cupola and core oven

A service track leads from the south door of the building, a continuation of the service track through the blacksmith and machine shops. All castings are forwarded to the latter shop over this line. A cross track at the south end of the foundry, with turntables at each end, connects this through track with that along the west side of the building. This connection is of considerable value to the machine shop in facilitating the removal of cast iron scrap to the foundry pile. The smaller castings from the cleaning room are also brought along to the machine shop over this route instead of through the front door of the foundry.

A large proportion of the castings made up are for stock purposes, and are stored on the stores department platform. These stock castings are piled in the cleaning room until a sufficient quantity to fill a box car has accumulated, when a car is run along opposite the cleaning room door on the standard track, and when filled, it is removed by the yard engine to the stores platform, minimizing trucking.

The system of heating the foundry is similar to that in use in the machine shop, a series of seven 1½ in. coils of pipe passing along all four sides. The lighting is different, the flaming arc being used, suspended from the lower chord of the roof trusses.

The foundry equipment was supplied by the Whiting Foundry Equipment Co., Chicago, Ill. (To be continued.)

Grade Reduction on the Timiskaming and Northern Ontario Railway.

In the report of the T. & N.O.R. Commissioners, recently issued, one of the more important matters discussed is the proposal to reduce the gradients on the first section of the line, from North Bay to Liskeard, 112.6 miles. This is dealt with in detail by S. B. Clement, M. Can. Soc. C.E., Chief Engineer, and Superintendent of Maintenance. He points out that the line from North Bay to Liskeard was located as a colonization railway, and placed under construction before the National Transcontinental Ry. was projected. When the latter line was laid out, it was seen that the T. & N.O. Ry. would have to be extended to a junction with it, and handle a large amount of traffic to and from it. The extension of the T. & N.O. Ry. from Liskeard was therefore located on the same gradients and curvature as the N.T. Ry. The difference between the physical characteristics of the two sections of the line is strikingly shown in the following table:—

	North Bay to New Liskeard.	New Liskeard to Cochrane.
Distance	112.6 miles	140.0 miles
Ruling gradient—North bound	1.45 p.c.	0.5 p.c.
South bound	1.2 p.c.	0.4 p.c.
Maximum curvature	6°	4°
Curvature per mile	83°18'	27°56'
Tonnage rating (10 wheel class)—		
North	560 tons	1,460 tons
South	700 "	1,710 "
Maximum tonnage rating (new consolidation class)—		
North	1,070 tons	2,700
South	1,290 "	3,160 "

Surveys have been carried on at intervals since 1906 to see to what extent it is practicable to reduce the excessive gradients between North Bay and Liskeard. The shorter and lighter of these gradients can be reduced without changing the alignment, while the longer and heavier can only be eliminated by rebuilding on a new location, in some cases at a considerable distance from the present right of way. Wherever these diversions are necessary actual locations have been made and estimates of cost prepared.

The most striking feature of the profile of this section of the line is what is known as the Merrick Summit. The elevation of the North Bay yards at the junction with the C.P.R. is 652 ft. above sea level, and from Riddle north for about 25 miles the general elevation of the country is approximately 1,000 ft. above sea level. The intervening Merrick summit, with an elevation of 1,300 ft. above sea level, is the most serious obstacle to be overcome. In the original location, this summit was crossed by deflecting several miles to the east from North Bay, following the rugged shores of Four Mile creek and the North river to the summit. After an exhaustive examination of the country on both sides of the right of way, it was found that a lower grade from North Bay could be obtained by following Duchesnay creek and the summit could be crossed at an elevation of about 1,170 ft., or about 130 ft. lower than the present summit, connecting with the present line at mileage 35, just north of Riddle. If at all possible it is desirable that the ruling grades on the first division should not exceed those on the second division, but it is a physical impossibility to obtain a 0.5% grade north from North Bay. This diversion, North Bay to Riddle, has been located with maximum curvature of 4°, and with maximum grades of 0.8% northbound and 0.6% southbound, all compensated for curvature. The diversion gives the lowest grade that can be obtained from North Bay without swinging the line far to the west to the Sturgeon river valley. With this diversion as a key to the situation it will be unprofitable to attempt to lower the grades between Riddle and Liskeard below 0.8% nortbbound and 0.6% soutbbound.

Having adopted these ruling grades, every grade in excess of them, between North Bay and Liskeard, was carefully examined. It will not be necessary to reduce a number of the shorter of these grades as they may be operated as momentum grades. The reduction of the grade between Liskeard and Cobalt from 1% to 0.6% can only be accomplished by a diversion that would pass at a considerable distance from the present station grounds, at Haileybury and New Liskeard. For this reason, it is advisable, for the present, to overcome this grade by means of a helper engine service.

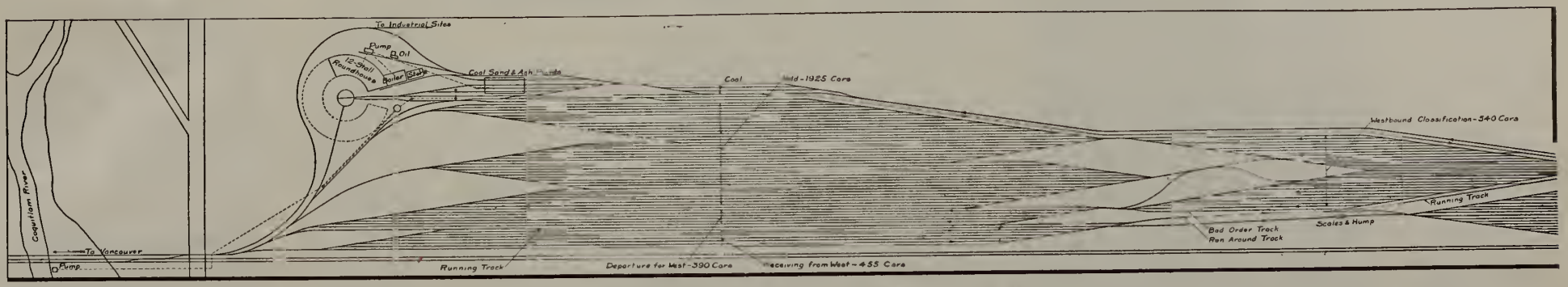
The following summary statements show the proposed method of reducing all grades between North Bay and Liskeard to a maximum of 0.8% northbound and 0.6% southbound:—

Location, mile to mile		Method of reducing grade.	Estimated Cost.
2.	35.	Diversion	$1,482,500
40.	41.2	Train filling	50,120
47.9	48.5	"	25,610
51.7	52.5	"	11,000
57.8	59.	"	39,100
60.4	61.8	"	33,280
62.5	63.3	"	9,200
66.7	73.2	Diversion	367,675
74.5	75.3	Train filling	16,225
90.	94.	Diversion	220,000
100.	100.5	Train filling	8,400
101.	112.	Helper engine service.	.....
		Total	$2,263,110

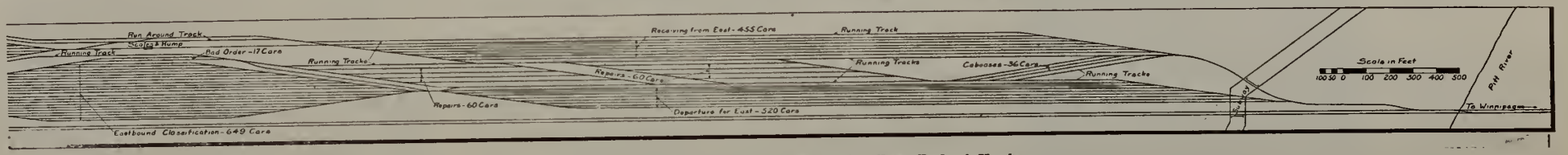
The total length of the North Bay-Riddle diversion will be 30 miles, replacing 33 miles of present line. The curvature on diversion averages 71°, and on the present line 93° per mile. The total rise and fall is as follows:—present main line—rise, 747 ft.; fall, 374; diversion—rise, 634 ft.; fall, 258.

Railway Bridges Over Navigable Waters.—The Board of Railway Commissioners has given notice in regard to applications for approval of bridge plans, that in all cases of bridge work over water in which there might be the slightest doubt as to it being navigable or not, railway companies must, in addition to the papers heretofore forwarded in support of their applications, furnish the Board with evidence sbowing that the question of the navigability of the water has been taken up with the Public Works Department and that, if the Department deems the waters to be navigable, the structure is satisfac-

Canadian Pacific Railway Terminal Yards at Coquitlam, B.C.



C.P.R. Terminal Yards at Coquitlam, B.C.—West End of Yards.



C.P.R. Terminal Yards at Coquitlam, B.C.—East End of Yards.

The C.P.R., as noted in previous issues of Canadian Railway and Marine World, has under construction at Coquitlam, B.C., a large terminal yard for the handling of freight originating in and directed towards Vancouver. It is of the double hump type, and has a total capacity in excess of 5,000 cars. The general layout of the yards is shown in the accompanying plan.

Coquitlam is to be made the big terminal point on the Pacific coast for the arrangement and distribution of the freight traffic in and out of Vancouver, from which it is distant about 18 miles on the main line. In consequence of the big demand which will undoubtedly be made on it immediately on completion from the constantly increasing traffic, the terminal had of necessity to be made of large proportions. Between the two approaches, the distance is something over two miles, a good estimate of the extent of the project.

The terminal yards may roughly be divided into eight different systems of trackage: Receiving from the east, departure for the east, repair yards, easthound classification, westbound classification, receiving from the west, departure for the west, and holding yards.

The main line along this section of the C.P.R. is double tracked. From the east, the westhound traffic is diverted to a siding just after crossing the Pitt river, which is having a heavy double track bridge constructed across it as a part of the terminal scheme. From a ladder track, the incoming traffic from the east is received into the northerly yard at the east end of the terminal, which contains seven tracks 2,900 ft. long, with a capacity of 455 cars.

From this receiving yard, the cars are drawn off through a similar ladder track to that on the other end to the westbound hump, which conforms to the American Railway Association's standard; the hump for traffic in the reverse direction is similar to it. Both humps have a run-around track for solid through trains that have not to be broken up for classification at the hump. The westbound classification yard, into which the cars descend from the hump, has a double ladder approach, and contains 27 tracks 1,000 ft. long, with a capacity of 540 cars.

The bulk of the traffic is westbound, and in consequence, a large storage capacity for Pacific coast freight is required. The westbound classification yard thus has two outlets, the one from the south into the westbound departure yard, and the other into the storage or holding yard. A track leading out at about the centre of the classification yard discharging ladder makes approach for all tracks to the south of that outlet equally open to the westbound departure and the holding yards.

The westbound departure tracks are nine in number, each 2,950 ft. long, with a capacity of 390 cars. The holding yard has 37 tracks, each about 2,200 ft. long, with the large holding capacity of 1,925 cars. To the latter yard, there are two entry tracks, with double ladders to each, and at the opposite end, there are also two departure tracks, one with a double ladder and the other with a single. These departure tracks converge to a siding on the main line, of sufficient length to hold 65 cars clear of switches, freeing the yard of trains ready to depart but awaiting orders.

The westbound traffic is received into a yard containing seven tracks, each 2,900 ft. long, like the reverse direction yard, with a capacity of 455 cars. From here, the trains are drawn off to the westbound hump, located directly south of the westbound classification yard, which is similar to the reverse direction hump.

The eastbound classification yard contains 20 tracks, with a capacity of 649 cars, the length of the yard being 2,300 ft. overall, approached at either end by a double ladder.

The eastbound departure track holds 520 cars on eight tracks, each 2,950 ft. long, both ends having a single ladder approach, leading off to the siding which runs on to the main line.

The repair track capacity of the terminal is for 120 cars in two yards, each yard containing four tracks, each 850 ft. long. These repair yards are located between the westbound receiving yard and the eastbound departure yard. These yards are approached by freight moving in either direction, for both of which they are equally convenient. In addition to these two repair yards, there is a bad order track adjoining each of the yards, to which the cars requiring repairs can be shunted awaiting removal to the repair yards.

Four tracks with a total capacity of 36 cars are run from the westerly end of the westbound receiving yard to the running track along the north side of the eastbound departure yard, for the reception of cabooses. These are removed from the trains as they arrive from the west, shunted to these tracks, and are in a position to be as easily shunted to the rear end of the eastbound departure yard, along the running track. No provision for cabooses is made at the west end of the terminal, as the traffic from that point into Vancouver does not require the use of a way car.

At the northwest corner of the terminal yards a 12 stall roundhouse is under construction, to be equipped with the usual divisional shop facilities. Provision is being made for the extension of the roundhouse to 48 stalls, when the demand arises. The coaling station and the ash and sand plants are situated north of the holding yard, directly east of the roundhouse, which is to be approached from the east. Coal cars for the coaling dock are accommodated on the four tracks to the east of the coaling dock.

Incoming locomotives from the east, after dropping their trains in the incoming yard,

come out at the west end of the yard, and proceed to the roundhouse along the northerly of the two through running tracks to the north of all the trackage. Similarly, locomotives to depart easterly, leave the roundhouse along the other track, coming down through the yards on a running track to the east end of the outbound yard, where the train is picked up.

The yard tracks throughout the body of the yard are 12 ft., centre to centre; the running and ladder tracks are 16 ft., centre to centre, from parallel tracks; the repair yard tracks are alternately 16 and 24 ft. centre to centre.

The plans for these yards were prepared in the office of J. G. Sullivan, Chief Engineer Western Lines, in the early part of this year.

A Talk to Ticket Agents.

By A. E. Duff, District Passenger Agent, Grand Trunk Railway, Toronto.

The following paper was read at the Canadian Ticket Agents Association's annual meeting at Ottawa recently:

As the majority of you are older both in years and ticket work than I am, I doubt if there is anything I can say in connection with passenger work that you do not already know. However, I will speak as if you were all ticket agents in my territory, on a few subjects that are constantly under my observation, viz.:—filing tariffs and circulars; displaying advertising matter, public time tables, etc.; newspaper advertising; through ticketing and exchange orders; ticketing children; soliciting travel.

THE FILING OF TARIFFS AND CIRculars in such a manner that they can be readily referred to is most important. It is annoying to a passenger whose time is limited, or who is leaving on a train due in a few minutes, to watch an agent look through several tariff binders or circular books for the fare, and this can be avoided if agents familiarize themselves with the various tariffs and circulars by checking them over frequently with the list sent out by the general passenger agent, so that when asked for a fare they will know at once what tariff it is in and where that tariff is.

J. A. Mackenzie, City Passenger and Ticket Agent, G.T.R., at Woodstock, Ont., has the best filing system I have seen, and I am sure those of you who have seen it will agree with me. I will not attempt to describe it any more than to say that the tariffs and circulars are placed in drawers in almost the same manner that correspondence is kept in a vertical filing cabinet, a separate pocket for each tariff and circular, with the name at the top so that it can be seen at a glance. I would suggest that any agent who is not satisfied with the system he is using, get particulars of this system from Mr. Mackenzie, who I am sure will be pleased to give it.

An agent who has spent some time looking for a fare, and then quotes as if he was not sure it was correct, does not inspire confidence, and I have known of cases where traffic has been lost on that account. Passengers contemplating a trip usually make a tour of the ticket offices for fares and information and the agent who can reply without hesitation generally secures the business.

A proper filing system also reduces the number of requests to the district or general passenger agent for fares and other conditions, and as these requests are usually sent by wire it will relieve the already over burdened wires.

DISPLAYING ADVERTISING MATTER, Public Time Tables, etc.—Posters advertising reduced fares for certain events should be displayed promptly on the authorized date; failure to do this may result in loss of revenue. Suppose the ticket offices of two competitive lines are adjacent, one displays a poster quoting reduced fares to a certain point and the other does not, is it not natural that passengers who intend to take advantage of the reduced fares will enter the office advertising them? These posters should be removed promptly after the last date that tickets are on sale. As far as possible such advertising matter should be placed in suitable frames, as the practice of hanging posters, etc., on walls or in windows is not attractive.

Public time tables should be placed in the frames provided for that purpose, in hotels and other public places, as soon as received. Time tables usually contain important changes in the schedule of trains. It is most desirable that the public be made aware of such changes as quickly as possible, and the most effective way of doing this is by displaying the time tables promptly. Agents who do not receive time tables concurrent with a change of time, should notify their district passenger agent immediately.

Steamship posters, giving sailing dates of the various steamships should be kept in the frames provided by the steamship companies, and not hung loosely. A poster out of date is as useless as a fifth wheel to a wagon.

NEWSPAPER ADVERTISING.—Advertisements appearing in the newspapers should be carefully checked to see that the fares, dates, time limits, etc., are correct Agents can render mutual assistance by suggesting advertisements that would be most suitable to their district. I have seen railways advertise their service to a certain point, when the trend of travel from the city in which the advertisement appeared, was to points in an opposite direction. This was no doubt caused by the individual who prepared it not being familiar with conditions in that district. All items appearing in the press, whether complimentary or otherwise to the railways, should be sent promptly to the district or general passenger agent with any remarks that seem pertinent.

THROUGH TICKETING AND EXchange Orders.—Unfortunately it is necessary to use exchange orders at small offices where the sale of foreign tickets is not large. These orders have to be exchanged en route, and are therefore the cause of more or less inconvenience to the passenger for several reasons, although I will only mention three, viz.:—

1. In some cases the passenger is obliged to leave the train during the time allowed for changing locomotives at some terminal point and rush to the ticket office to have his order exchanged; he is uneasy, fearful that the train will pull out without him. If he has a wife and family on board, they pass through the same state of anxiety.

2. If the order is to be exchanged at a large office, say, Toronto, even if there is ample time between trains, it is not unusual during the summer season to find a long line of tourists ahead with orders calling for round trip tickets to the Pacific coast that take some time to prepare and the result is a long delay.

3. If the order calls for a return ticket, it sometimes happens that the exchange clerk omits to return the portion reading from the station the order is exchanged at to starting point, and the error is not noticed until the passenger presents the ticket at his final destination to have his baggage checked on the return trip, with the result that baggage is checked only to the station where the order was exchanged, and on arrival there the passenger has to visit the exchange office in the hope of finding his ticket. If he is not successful he must purchase another ticket to his home, recheck his baggage and file application for refund.

Endeavor in all cases to ticket your passenger through to actual destination or nearest point thereto authorized in your tariff.

If you have not the required coupon ticket in stock, and time will permit, send an exchange order, or write to your district passenger agent, specifying the route desired and the proper coupon ticket will be furnished. Be careful in quoting through fares, but at the same time do not be fearful about making a mistake to the extent that you suggest ticketing to some intermediate common point and have the passenger repurchase, as there is the almost certainty that it will cost him more money, and there is the possibility, at least in some instances, of the company you represent getting a shorter haul than need be.

TICKETING CHILDREN.—I assume that every ticket agent here has been asked at some time or other by parents or guardian if their boy or girl can travel free. Always explain what the rules are regarding the transportation of children. Every time you persuade parents to purchase proper tickets for their children, you prevent the possibility of a dispute and unpleasantness on the train with the conductor, who has no option but to collect the proper fare. It is well to remember that two half fares are equal to one full fare.

SOLICITING TRAVEL.—Additional traffic can be stimulated by systematic solicitation. Practically every agent knows where business may be found, but very few I find have any particular system of soliciting. I would suggest that each agent prepare a list of the various labor bureaus, steamship agents, contractors, business houses, etc., in his vicinity, and make a practice of calling on them periodically, leaving a folder or two each time, keep a record of the date of each visit, and the business secured or expected, and I am sure that at the end of six months the results will surprise you.

In conclusion, I may say that helpful suggestions are always appreciated.

A RAILWAY OFFICIAL'S APPRECIATION OF RELIABLE INFORMATION.

J. O. Walsh, Superintendent, Motive Power and Operation, Anticosti Island Railway, writes:

"Enclosed please find postal note for $2, for two years' subscription for your very valuable publication. Canadian Railway and Marine World is an old friend and I wish to be sure of it for the next two years. No railway man in Canada knows better how reliable your publication is."

Appropriations sufficient to eliminate many grade crossings within the limits of greater New York are about to be asked for by the Public Service Commission. The total sum necessary to carry out this programme will be about $6,000,000, it is said, and the commission has made the first move by a preliminary request for $1,500,000 for 1913.

Railway Mechanical Methods and Devices.

Handling Tender Truck Repairs at C.P.R. Winnipeg Shops.

In these shops the department for the repair of locomotive trucks is well laid out for convenience in the handling of the work. Through the centre of the truck repair department there is a cross track, the full width of the light machine tool bay of the locomotive shop.

Paralleling this through track, with a track on each side, is a wider gauge track —about 8-ft. gauge—on which a small bridge crane operates, as shown in the accompanying illustration. The end legs of the bridge are composed of channel sections, set at an angle to each other, joining at the top, and braced halfway down and at the bottom, double flanged wheels at the outer ends of the bottom bracing supporting the structure, permitting it to be moved from one position to another. As will be noted in the foreground, the bridge can be clamped in position by the attachment, which consists of a couple of pieces of bar, clamped together by a single bolt. The cross member of the bridge is a flat bar section, as the only strain to which it is subject is one of tension.

From each end of the bridge a jib crane, with a radius of about 7 ft., has a free arc of movement of nearly a full circle. They are supported by heavy vertical rods secured in bearings at top and bottom of the side members of the bridge.

On each jib arm a block and chain is provided, by means of which any part of the truck may be removed at will to the floor alongside, or on to an awaiting truck. This relieves the overhead cranes, and is at the same time more convenient, making it possible for a double gang to operate without interference. It has the added advantage of being movable to the job, or to the point most convenient to it.

Small Bridge Crane for Truck Repairs.

Mounting Passenger Car Wheels in Lathe at Canadian Northern Railway Shops.

An attachment is in use at the C.N.R. Winnipeg shops for the easy mounting of passenger car wheels in the car wheel lathe. Attached to the front of the lathe there is a looped section of bar iron, hinged thereto, the upper face at the inner end being at the level of the lathe face cut-out, through which the axles roll into position in the lathe in the usual manner.

An old coach air brake cylinder is buried under the floor in front of the machine, the plunger extending through the floor. A hook at the upper end of the plunger makes a loose connection with the front of the hinged loop, so that the loop can be raised. The upper end of the stroke is so set that the upper surface of the loop is at the level of the lathe opening.

The coach wheel lathe is near one end of the shop, near the end door, through which the mounted wheels are rolled on a track into position, a few feet in front of the lathe. Here they are turned around a quarter turn on a small sunken floor jack, lowered, and then run forward until the axle strikes the loop. Turning on the air raises the outer end of the loop, making it only necessary to roll the wheels along on the axles into the lathe.

Wood Lathe Caliper Device.

A practice of leaving a portion of station water tanks beneath the spout pipe as a reservoir in which sediment in the water supply may settle and get drawn out without passing into the locomotive tank, is finding its way into favor.

Wood Lathe Caliper Device at Grand Trunk Railway London Shops.

A wood lathe in the carpenter shop of the G.T.R. car shops, at London, Ont., has a calipering attachment applied by W. H. Butler, the operator, which is shown in the accompanying illustration. In general, it resembles the calipering attachment to be found on all modern coach wheel lathes.

Attachment for Rapidly Mounting Wheels in Coach Wheel Lathe.

Back of the lathe spindle, there is a projecting lug of wood, extending to just beyond a line at right angles to the lathe centre. Across the face of this lug, there is a movable wooden member, carrying a hinged piece of thin sheet iron, as indicated in the operator's hand. For duplicate work in quantities, the operator turns down the first piece to the proper diameter, and then sets the movable piece up towards the job being turned, until the strip of iron when raised in a horizontal position will just scrape the wood when raised and lowered by the operator in the manner shown.

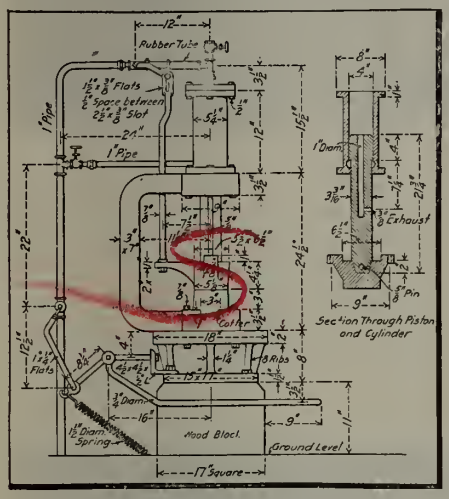
In operation, the operator, after placing the rough block to be turned down in the lathe, swings the caliper leg over so as to rest on the job, and after the several passes of the cutting tool along the rest, sufficient material will have been removed to let the leg drop, advising the operator automatically of the fact that the stock has been removed to the proper diameter. The finishing of the stock to the final shape on the face and corners is then a simple task. The job shown in the lathe is that of making small wooden handles such as are found on boiler water gauges. These are screwed on the end of an arbor screw, turned to diameter by the use of the caliper gauge, and then shaped.

Incidental to this method of turning up work, attention is drawn to the system of air draft. A suction funnel is located directly beneath the cutting tool, the horizontal section of the suction pipe being telescoped so as to be useful in all positions, for all diameters of work being turned. A suction pipe along the wall at the rear of the lathe connects to this pipe across the ways of the lathe. This rear pipe has a long opening in the front, a corresponding sleeve on the end of the cross pipe covers this opening, so that the suction connection may be adjusted to different positions along the lathe bed. The movement is now within about 6 or 7 ins., but could be extended to the full length of the lathe bed.

Air Hammer at Grand Trunk Pacfic Railway Shops.

The G.T.P.R. shops at Rivers, Man., operate under conditions peculiarly their own, for the motive power repairs of a system that already extends over upwards of 2,000 miles and is rapidly increasing in both mileage and volume of traffic, are all handled at this point, which has only been equipped as a divisional point, with only the small buildings to be found at such a point on a line that has no branch lines emanating from the divisional point. The equipment of the shop has of course been increased beyond that contemplated for the divisional shop, but at the same time, the equipment added has only been that absolutely necessary to carry on the work. In consequence, considerable ingenuity on the part of the different foremen has been necessitated to handle the motive power repairs with the machines at their disposal.

In the blacksmith shop, one of the most essential of all the tools found in the usual railway repair shop was missing, viz., a steam hammer. The foreman, S. Lewis, realized that one must be had, and not seeing one coming in the usual channel, set about making one, the hammer shown



Air Hammer Made of Scrap Material.

in the accompanying illustration being the result.

All the parts that enter into the construction are taken from the scrap pile, and represent old parts from locomotives. The frame of the hammer is an old locomotive drawbar, with the ends bent around parallel to each other; the base is an old locomotive buffer centre casting, with the drawbar bolted thereto and the whole standing on a wooden block; the cylinder at the top is the end of a locomotive axle, turned with flange and bored out parallel the full length. It will thus be seen that the major portion of the hammer parts are such as may be found on almost any shop scrap pile. The plunger rod is almost the full diameter of the cylinder, with a forged block at the lower end for the hammer head.

To the upper and lower ends of the cylinder, there are air connections, leading from a common air pipe up the rear of the machine, in which there is a valve operated by a treadle extending around the wood base for the convenience of the operator. Once the air is turned on by the pressing of this treadle, the hammer continues automatically, stopping on the release of the foot treadle.

The manner of the automatic operation is as follows: Through the centre of the plunger rod, there is a 1 in. hole, near the lower end of which a radial ⅜ in. hole communicates with the outside. A rod fastened to the rear of the hammer head, connects with an air valve in the pipe connection to the upper end of the cylinder, the upper end of the rod being slotted, for reasons to be explained. With the hammer in its lower position, the upper end valve is held closed. On pressing the foot treadle, the air enters the annular space around the bottom of the cylinder, the exposed surface being slightly more than sufficient to raise the dead weight of the hammer. On rising, the upper end air valve remains closed until the plunger has travelled the length of the slot, when the valve commences to open; and by the time the plunger is at the upper end of its stroke, the air is on full, forcing the hammer down smartly, adding impetus to the hammer above that given it by gravity. The downward plunge is against the force of the air acting under the hammer, but the latter is so slight as to be negligible.

As the hammer descends, the ⅜ in. opening in the side of the plunger rod becomes exposed below the bottom of the cylinder, the pressure relieving itself from the upper end of the plunger almost instantly by the escape through this hole. As the plunger still further descends the slotted rod at the rear closes the valve at the top. After striking, the operation repeats itself automatically.

The stroke of the hammer is 6½ ins., and the air pressure is normally 70 lbs. Any refinements in the intensity of the force at which the hammer descends may be simply regulated by the foot treadle. From the fact that the stroke is so short, it is not possible to work very heavy material, but it is a common practice to weld pieces up to 1½ in. diameter.

Birthdays of Transportation Men in December.

Many happy returns of the day to:—

E. T. Agate, M. Can. Soc. C.E., District Engineer, Canadian Northern Ontario Ry. Sudbury-Port Arthur Line, Sudbury, born at Pittsford, N.Y., Dec. 7, 1874.

E. Alexander, Assistant Secretary, C.P.R., Montreal, born in Yorkshire, Eng., Dec. 8, 1862.

J. H. Barber, Engineering Department, C.P.R., Montreal, born at Cobourg, Ont., Dec. 20, 1856.

H. E. Bissell, Right of Way and Claims Agent, Grand Trunk Pacific Ry., Winnipeg, born near Novan, Que., Dec. 31, 1867.

N. E. Brooks, Division Engineer, C.P.R., Calgary, Alta., born at Sherbrooke, Que., Dec. 25, 1866.

Harold Browning, steamship agent, etc., Windsor, Ont., born at Stamford, Lincolnshire, Eng., Dec. 2, 1864.

T. C. Burpee, Engineer of Maintenance of Way, Intercolonial Ry., Moncton, N.B., born at Sheffield, N.B., Dec. 11, 1852.

W. W. Butler, Vice President, Canadian Car and Foundry Co., Montreal, born at Danville, Ohio, Dec. 9, 1862.

M. M. Campbell, C.E., Building Inspector, G.T.R., Montreal, born at Bridgeton, N.B., Dec. 17, 1879.

J. A. Carroll, Road Foreman of Locomotives, District 1, Canadian Northern Ry., Rainy River Ont., born at Chilton, Wisc., Dec. 14, 1865.

A. H. Chave, Purchasing Agent and Assistant to First Vice President, Canadian Car and Foundry Co., Montreal, born at Williamsbridge, N.Y., Dec. 26, 1872.

J. E. Entwistle, acting Superintendent, District 2, Western division, Canadian Northern Ry., Saskatoon, Sask., born at Streetsville, Ont., Dec. 1, 1859.

H. H. Gildersleeve, Manager, Northern Navigation Co., Sarnia, Ont., born at Kingston, Ont., Dec. 15, 1865.

W. H. Gardiner, City Freight Agent, C.P.R., and District Freight Agent, Esquimalt and Nanaimo Ry., Victoria, B.C., born there Dec. 6, 1859.

A. S. Goodeve, member Board of Railway Commissioners for Canada, born at Guelph, Ont., Dec. 15, 1860.

A. J. Gorrie, ex-General Superintendent, Canadian Northern Quebec Ry., now Receiver, Quebec and Lake St. John Ry., Quebec, born at Raith, Kirkcaldy, Scotland, Dec. 10, 1868.

W. H. Grant, Manager of Construction, Mackenzie, Mann and Co., Ltd., Toronto, born at Acton, Ont., Dec. 8, 1858.

F. P. Gutelius, M. Can. Soc. C.E., ex-General Superintendent, Eastern Division, C.P.R., Montreal, born at Mifflinburg, Pa., Dec. 21, 1864.

D. B. Hanna, Third Vice President, Canadian Northern Ry., Toronto, born at Thornliebank, Scotland, Dec. 20, 1858.

S. P. Howard, ex-General Freight Agent, Eastern and Lake Superior Divisions, C.P.R., Montreal, born there, Dec. 30, 1865.

A. J. Isbester, Assistant District Engineer, Port Arthur district, Canadian Northern Ry., Port Arthur, Ont., born at Ottawa, Dec. 18, 1879.

R. Johnson, Locomotive Foreman, C.P.R., White River, Ont., born at Quebec, Que., Dec. 24, 1863.

B. B. Kelliher, Chief Engineer, Grand Trunk Pacific Ry., Winnipeg, born in Ireland, Dec. 26, 1862.

J. T. McGrath,, ex-Superintendent of Motive Power and Equipment, Chicago and Alton Rd., Bloomington, Ill., born at Toronto, Dec. 6, 1869.

A. T. McKean, City Freight Agent, C.P.R., Winnipeg, born at St. John, N.B., Dec. 18, 1886.

L. Macdonald, Division Freight Agent, G.T.R., Toronto, born at Montreal, Dec. 10, 1871.

J. Niblock, ex-Superintendent, C.P.R., Victoria, B.C., born in York county, Ont., Dec. 21, 1849.

A. Price, General Superintendent, Alberta Division, C.P.R., Calgary, born at Toronto, Dec. 6, 1861.

G. D. Robinson, Assistant Export and Import Freight Agent, C.P.R., Toronto, born at St. John, N.B., Dec. 7, 1877.

C. Schreiber, C.M.G., Consulting Engineer, Department of Railways and Canals, Ottawa, Ont., born at Bradwell, Essex, Eng., Dec. 14, 1831.

F. P. Smith, Secretary, Richelieu and Ontario Navigation Co., Montreal, born there, Dec. 23, 1873.

C. E. E. Ussher, Passenger Traffic Manager, C.P.R., Montreal, born at Niagara Falls, Ont., Dec. 29, 1857.

H. H. Vaughan, Assistant to Vice President, C.P.R., Montreal, born at Forest Hill, Essex, Eng., Dec. 26, 1868.

R. C. Vaughan, Assistant to Third Vice President, Canadian Northern Ry., Toronto, born there, Dec. 1, 1883.

W. Wood, Locomotive Foreman, C.P.R., Megantic, Que., born at Montreal, Dec. 6, 1863.

A Laundry Car has been introduced on the Russian government railways for the use of the Imperial troops. The car is 9 ft. 10½ ins. wide and 13¾ ft. high outside at centre from rail, and is built according to the Russian standard 5-ft. gauge. The equipment includes steam boiler, condensing tank, feed pump, injector, steam engine, cold and hot water tanks, soda cleansing medium, washing machine, draining box, centrifugal dryers, mangle, fans, ventilator, and disinfector, together with ironing board, with heaters at the finishing end, the central portion being used for drying and storing the linen.

Handling Wheels at Grand Trunk Railway Port Huron Car Shops.

A handy method of handling and storing mounted car wheels from the time they arrive to the time they are ready to depart, has been developed at the G.T.R. car shops, Port Huron, Mich., the idea held in mind throughout being to so place the wheels in their journey through the repair shop as to minimize as much as possible the shifting about required, and at the same time make the arrangement as simple in operation as compatible with the arrangement possible in the limited space that can be utilized.

The machine shop and coach shop are in the same building, the parts being in line with each other. Similarly situated, with an intervening passage way, is the freight car shop, parallel to the other two. Consequently, all communication between the freight and machine shops is across the intervening gap.

For transportation purposes between the two shops there is a single track overhead craneway, constructed of timber work, leading from within one shop to within the other, and supplied with an air hoist as shown in fig. 1. This hoist is constructed of a couple of old cylinders placed end for end, the cylinders being mounted horizontally, with the cable so mounted as to give a 2 to 1 movement, the cylinders being large enough to lift the largest trucks with ease under normal air conditions. Trucks and wheels are lifted bodily by this hoist and carried across to the shop required. To each of the uprights of the crane posts, there is an air connection from the shop, to which the hose from the hoist is attached for operation in any position along the travel. The hoist thus requires only a short hose. The crane girders serve a double purpose, being used for the carrying of the electric power wires across between the shops. The power house is located in the background to the left, in fig. 1.

Both old and new mounted wheels are stored on the platform shown in fig. 2, alongside the coach shop. The near track is for the storage of old and used up wheels, while the other is for newly mounted wheels which are ready to be taken away.

The sources from which old wheels are obtained is twofold. They are either dismounted from trucks in the freight shop, or they come in from the terminal points along the line, where renewal stores are maintained from which to fit up the trucks anew. When the wheels come from the freight car shop, they are brought across on the hoist just mentioned and deposited in the foreground in fig. 2, the two posts shown being two of the crane uprights. They are lowered on to the platform in the direction in which the wheels to the right in the immediate foreground are placed, and run up the incline on the interlocking tracks to the left. A great number of the mounted wheels come in from outside points as mentioned, generally on flat cars, and provision is made for the ready unloading on to this same track.

It will be noticed that the platform is at the level of the flooring of a car, as shown by the box car to the left. The far end of the platform drops off abruptly, like the edge of the platform alongside of the box car, and does not slope off as at this end. Two tracks on the ground, in line with those on the platform, lead up to the end of the platform, and from flat cars on these tracks the mounted wheels are unloaded by rolling across the gap between the end of the car and the platform on boards. The storage tracks are thus filled from either end.

From the storage on the near track they are drawn off as required to the machine shop for dismounting and remounting with new wheels. The door to the machine shop is directly to the right in fig. 2, and to bring the wheels down the slope and switch them around into the machine shop with very little labor, has been accomplished with the aid of a simple little device. Under ordinary conditions the wheels, if allowed to roll down the slope, gained considerable velocity, and when they reached the bottom they ran across the path into the machine shop, and came up hard against a brick wall of the air brake department immediately to the right (not shown in the illustration). The mounted wheels had then to be turned through a right angle and run into the shop. Allowing the wheels to run down the slope unattended like this had serious objections, as the brick wall suffered materially from the impact of the sharp edges of the wheels. Likewise, blocking the wheels down the slope had objections from the fact that too much labor was involved, as the wheels are so heavy as to require at least two to handle. This led to the use of the wrinkle mentioned, and which is shown swung out of position just beyond the right wheels of the batch in the immediate foreground in fig. 2.

This device, located in its proper position, is shown in fig 3. It consists of a small square sheet of boiler plate, to which is rivetted a piece of angle bent to a quarter

Fig. 1.—Air Hoist for Conveying Wheels between Shops.

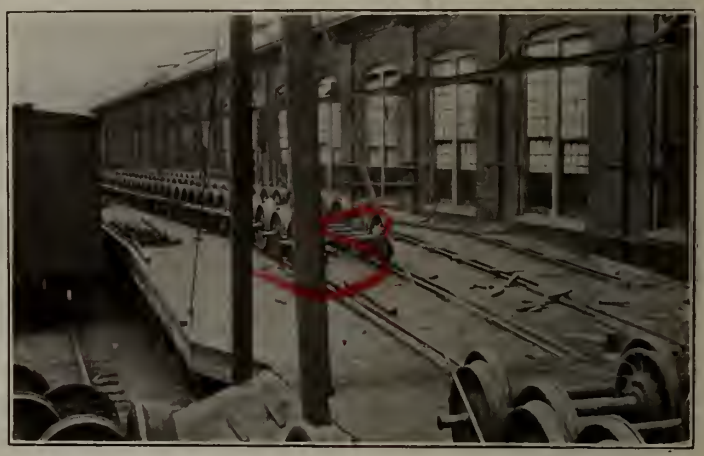


Fig. 2.—Storage Platform for Incoming and Outgoing Wheels.

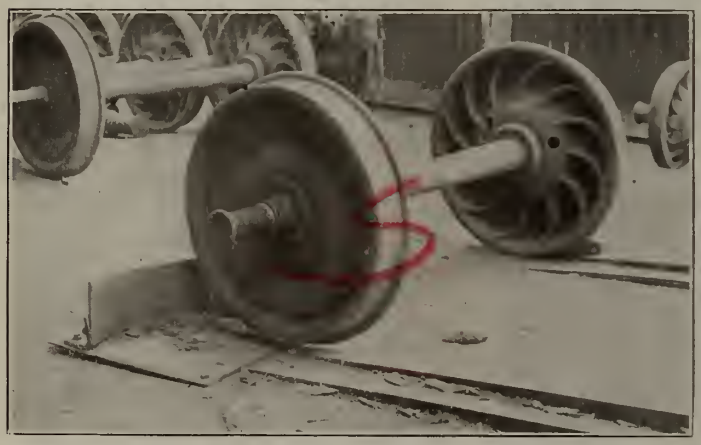


Fig. 3.—Device for Switching Wheels into Machine Shop.

Air Driven Saw for Cutting Babbit.

of a circle, with a piece of plate rivetted to the upturned leg of the angle, projecting to the height indicated. This turning plate, pinned at the near corner to the platform decking, can be swung back to the left out of the way, but when in operation it is swung to the right into the position shown, directly in line with the inner pair of tracks. The inner wheel of the pair allowed to descend the slope of the platform unattended, strikes this obstruction to its forward movement very forcibly, the inner wheel being stopped, the momentum carrying the outer wheel a quarter turn to the left, when the operator at the proper moment giving the inner wheel a push off, the remaining momentum is sufficient to carry the wheels on into the machine shop.

In the machine shop they undergo the usual course of dismounting in the hydraulic press, and, if necessary, the journals are turned down, and finally, new wheels are mounted. They are then brought out over the same path to the tracks along the wall in fig. 2. They can either be run up the slope on to these tracks, or else picked up by the small overhead travelling crane, and run along to be placed with the batch of the particular size to which they belong. The air hoist on this runway has a very short air connection, as it will be noticed that at short intervals along the wall there are air connections from an air main suspended from the wall.

The principal use for this travelling crane is in the picking out of a required wheel from the long line of wheels stored there, and carrying it to this end for transfer to the freight car to be introduced into a truck in that shop. Similarly, it is used for carrying the mounted wheel along to the far end of the platform, where the receiving flat cars are located.

The facilities for unloading and storing axles is also shown in this illustration, fig. 2. There is considerable clear space to the left of the storage tracks on the platform, on which axles are unloaded from cars on the track adjoining. They are also stored to the rear of the point from which this view was made, on the platform, as indicated in fig. 1, where they can also be unloaded from the same track to a lower level.

Babbit Saw at Grand Trunk Railway Stratford Shops.

A very handy saw for cutting up piston packing rings, and other babbit and composition articles, in use in the G.T.R. shops at Stratford, Ont., in the babbitting department, is shown on page 600.

In the centre of a small cast iron table, about 12 by 15 ins., there is a slot with a saw projecting through. This is driven from a small air motor on the left of the table, the motor being of the turbine type with blades on which the air impinges. To maintain the saw at a uniform speed and prevent fluctuations, there is an intervening flywheel. This saw is a most useful addition to any shop.

A saw of the same kind is in use in the pipe department for cutting off copper pipe and similar purposes.

The Bishop Construction Co., Montreal, has been placed in liquidation, and the Superior Court has appointed J. A. McDavis and D. C. Raymond as joint liquidators. The immediate cause of the order was judgment on a note for $688, but previous to this judgment for $15,000 had been given by default in other actions. The company had a contract on the Quebec and Saguenay Ry.

Stone Ballast From the Crusher to the Track.

The question of stone ballast is an extremely important one with the maintenance of way department of the principal railway. On railways where it can be procured, the ballast is either crushed by the railway or purchased from private parties. A thorough discussion of the kind of ballast, equipment for handling it, methods and amount necessary for making good track is considered timely, and your committee beg to submit the following:—

Rock ballast should be made from hard, tough, durable trap, flint, or limestone rock, or other hard stone, acceptable to the chief engineer or engineer of maintenance of way.

The stone should be broken to cubes, the maximum of which will pass through a 2½ in. ring and the minimum of which will not pass through a 1½ in. ring. The crushed stone should be free from screenings, dirt and rubbish.

Ballast can be handled in side dump cars with flat bottoms, or coal cars, but the Rodger ballast, Hart convertible cars, or any of similar type of ballast car on the market will secure very good results. Ballast after being unloaded should be handled with a spreader, the Rodger ballast plow giving very good results.

The track should be prepared for ballast by digging out all the old ballast down to the bottom of the ties, and rounded up to ½ in. above bottom of ties in centre. This will keep ties from running together until track is filled with stone. This should be levelled off at end of ties.

All decayed ties should be removed and replaced with new ones. Ties should be properly spaced and track put to gauge and all spikes driven down so that ties will be tight up to rail. Then crushed stone ballast should be unloaded to fill up between the ties in centre of track. This will help keep track in line and prevent ties from bunching. Eight or 12 ins. of stone ballast should be placed under ties if possible and a minimum depth of 4 ins. should be maintained.

In raising track on a 9 in. raise, the track can be put up in one lift if a large force of men can be secured. Ordinarily the track is put up in two lifts. In raising in one lift the foreman in charge will soon learn by practice how many rails a train of 15 or 20, fifty ton cars will raise to the required height. The number of rails are counted off and sufficient ballast is unloaded and ploughed out. Four men are started making places for jacks. One end of the sight board is placed on stake, and board leveled. Four jacks are used; two, one-half rail ahead of others, the first pair raising the track about half the required height. No tamping is required with these jacks, as the stone runs under the track by its own weight. The second pair of jacks raise the track to the required height. A force of 20 men should follow behind, whose particular work is to tamp and these should be followed by a foreman and eight men to keep the track in perfect line. The first half of the day should be given to raising the track, the balance of the day being devoted to tamping and lining.

Where two lifts are made, the ties should be tamped with shovels their entire length. After the second lift, the ties should be tamped with tamping picks or bars, the tamping extending from ends of ties to 12 ins. on inside of rail. Particular attention should be paid to tamping under the rail but the centre of the ties should not be tamped.

In dressing up single track with ballast, the ballast should be filled in at least within 1 in. of top of ties and should slope from ends of ties to edge of ballast shoulder. This shoulder should not be less than 4 ft. from gauge line of outside rail to the edge of shoulder.

Double track should be dressed in the same way, stone in centre ditch being level with stone in track. When the track is bonded for electric signals, it is very desirable that the stone be kept below base of rail. The track, after being raised, should be left from four to six days before dressing up.

In handling 600 to 1,000 yards of stone daily and giving track 9 to 12 ins. of raise, the force employed largely depends on the amount of traffic handled, and the views of the maintenance of way officials. A force of 40 to 50 men should be used in the work. A force organized as follows will give excellent results:—1 chief foreman. 1 assistant foreman to raise track. 1 assistant foreman to line track. 2 men flagging. 4 men digging out for jacks. 13 men on jacks, (4 digging holes, 8 on jacks, 1 with levelboard). 20 men tamping. 8 men lining. 1 water boy (or more if necessary).

In the discussion on the foregoing report a very general objection developed against the large sizes of stone ballast recommended, viz., from 1½ in. to 2½ ins., except that one member of the committee favored ½ in. to 1¾ in. It was decided to change the recommendation, giving a smaller maximum size and a very much smaller minimum size, viz., from ½ in. to 2 ins.

A MASTER CAR BUILDER'S OPINION.

John L. Hodgson, Master Car Builder, Western Division, Grand Trunk Ry., Port Huron, Mich., writes:—

"I am very glad indeed to be a subscriber to Canadian Railway and Marine World, for the information it contains is very interesting. I look forward each month to its receipt, and enjoy reading it."

Railway Route Maps Approved by Minister of Railways.

The Dominion Minister of Railways has approved of the following route maps:—

Alberta, Peace River and Eastern Ry., Oct. 15, from Cochrane, Alta., to Edmonton and Peace River, about 475 miles.

Canadian Northern Ontario Ry., Sept. 30, revisions on Sudbury-Port Arthur line, 30.9 miles.

Canadian Northern Quebec Ry., Sept. 30, Huberdeau westward 12 miles.

Sept. 30, Rawdon to St. Donat, 42 miles.

Canadian Northern Ry., Sept. 30, revision of Thunderhill branch, 53 miles.

Sept. 30, revision of Humboldt-Calgary line, 30.9 miles.

Sept. 30, Bienfait to Estevan, 9 miles.

Canadian Pacific Ry., Sept. 30, Bergen, Man., northeasterly, 9.92 miles.

Erie, London and Tillsonburg Ry., Sept. 30, from London to Aylmer, about 19 miles.

Grand Trunk Pacific Branch Lines Co., Oct. 15, extension of Moose Jaw northwest branch from Central Butte across the South Saskatchewan river, about 45 miles.

Manitoba and Northwestern Ry. (C.P.R.), Sept. 30, grade revisions between Minnedosa and Bredenbury, about 35 miles.

Montreal and Southern Counties Ry., Oct. 15, extension through Greenfield Park municipality, about 2¼ miles.

Toronto Eastern Ry., Sept. 30, Pickering westerly, about 12 miles.

Motor Car Under Test on Schomberg and Aurora Railway.

A short description of a motor car under test on the Schomberg and Aurora Ry., a division of the Toronto and York Radial Ry., operated by steam, appeared in Canadian Railway and Marine World for September. Since then, further information has been obtained.

The accompanying illustrations show the construction of the car. The truck is of a unique design, built up entirely of plate and structural shapes, a construction that is said to give the maximum strength for a given weight, lightening the construction materially. The wheel base is 120 ins., with 33 in. chilled cast wheels mounted on 4 in. axles. The journals operate in ball-bearing journal boxes, and are so arranged that the wheels and axles may readily be taken from the truck.

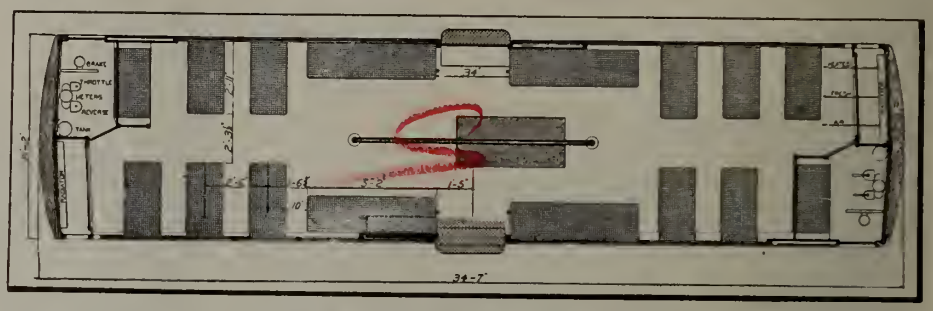
The motive power is a small gasoline engine, directly connected to a generator, the combined unit being supported from a frame supported from the truck on a spring suspension in such a manner that but little of the shock and impact of the truck is imparted to the motive power. The gasoline motor group contains a battery of four 4 cycle 5½ x 6½ in. cylinders, developing 36 h.p. at 600 r.p.m. This unit is directly connected to a 20 k.w. compound wound differential pole generator. This comprises the power station of the car. To each axle there is geared in the usual manner a 25 h.p. compound wound motor, provided with a heavy series winding. These motors have a direct flexible connection from the generator, dispensing with the resistances and controllers. The connection between the generator and motors is such that as soon as the engine is accelerated, the shunt fields of the motors are pre-energized before the armature circuits of the motors are closed, giving a cushioning effect to the motors without the use of resistance and at the same time providing against the operator's misuse. The control of the car is entirely through the engine speeding up the latter to increase the car speed, and cutting off gasoline for coasting, eliminating standby losses.

The underframing of the car is also of steel of the same general construction as that of the car truck. It has a four point support on the frame. Nests of semi-elliptical springs at each end provide the main support for the car body, giving to the latter an easy movement, while at the same time lighter semi-elliptical springs at the centre of each side frame steady the car and keep it level.

The general dimensions of the car body are 34 ft. 7 ins. over all length; 8 ft. 2 ins. and 7 ft. 9 ins., outside and inside widths; and total height above rail of 11 ft. 8 ins. The total weight is about 13 tons, with a seating capacity of 38, giving a small unit dead weight of car per passenger. Experience has demonstrated that it is possible to carry as many as 125.

The car is of the side entrance type, double ended with a symmetrical arrangement of the interior fittings. Inside the doors on each side are longitudinal seats, the balance being cross seats. The motorman's cabin is at the right hand side in the direction of operation. Here, the operation of the motors is controlled, cranking being performed electrically by means of storage batteries, which are also used for illumination. The interior of the car gives little evidence of the nature of the power utilized, only the tops of the engine cylinders projecting through the car floor into a narrow wooden cage about 8 ins. high, arched by a longitudinal hand rail at a convenient height.

The heat of the hot jacket water from the engine is utilized for the heating of the car. Filling the balance of the car ends not occupied by the motorman's cabin, there is a radiator similar in construction to that found on automobiles, through which air from the outside is drawn in and heated. A sliding curtain in the end regulates the amount of air to be drawn in, as determined by the weather conditions. In hot weather, provisions are made for deflecting the current of hot air, and discharging it outside.



Interior Arrangement of Gasoline Electric Car.

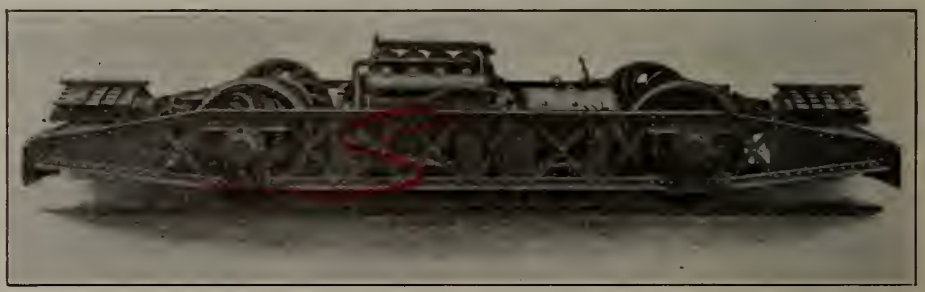
Gasoline Electric Car under Test on Schomberg and Aurora Ry.

The braking consists of a rack and pinion, the rack operating a vertical plunger in an oil cylinder, the oil from the latter being forced into the brake cylinders, one of which is mounted on each side of the car frame, the plungers bearing directly on the wheel.

The consumption of gasoline is said to be a gallon for from four to six miles of operation under normal conditions.

The car was under test from Oct. 3 until on into November, making two round trips per day between Schomberg and Aurora, a distance of 15 miles, or a daily running of 60 miles. All the passenger traffic was handled by this one car. Daily observations have shown the economy of operation claimed for it, the fuel and oil averaging about 4 cents a mile. While giving satisfactory service, it was considered that better operation could be obtained on lines with less steep gradients. On this line, the maximum is 4½%. The conclusions drawn were that the most satisfactory service could be produced on branch lines with grades not exceeding 2%, and for that service the car is well adapted.

In addition to the tests on the Schomberg and Aurora Ry., a trial trip under more satisfactory conditions was made as far north as Gamebridge on the Canadian Northern Ontario Ry., on which it was learned that, on the level, the car could produce a speed of from 40 to 42 miles per hour, and could generate as much as 32 k.w. from the 20 k.w. generator. On the run from Galt to Toronto over the Grand Trunk Ry., when being delivered for the test, the trip was said to have been made in 2 hours, with the speed running up as high as 44 miles an hour.



Truck of Gasoline Electric Car.

This car was built in York, Pa., and was imported by the Preston Car and Coach Co., which has bought the manufacturing rights for Canada. The builders are truck manufacturers, not car builders, and it is probable that the body will have to be considerably changed in future construction, to meet Canadian conditions.

On the conclusion of the test on the Schomber and Aurora Ry. and C.N.O. Ry. the car was taken back to Preston, Ont.

Traffic Orders by the Board of Railway Commissioners.

The dates given for orders are those on which the hearings took place, and not those on which the orders were issued:—

Pressed Brick Rates.

17781. Oct. 16. Re order 17552, Sept. 21, directing, inter alia, the G.T.R. to restore the proportion, viz., 88c. per ton, of the joint rate of $1.60 per ton charged on pressed brick from Bradford, Pa., to Windsor, Ont., within 45 days from date of order; and the application of the G.T.R. for a rehearing of the matter, and postponing the effective date of the order. It is ordered that the effective date of the order be postponed to such date as the Board, after a rehearing, shall determine.

Pulp Wood Rates to United States.

17826. Oct. 23.—Re application of International Paper Co. and others, under sec. 323 of the Railway Act, for an order disallowing tariffs of Canadian Pacific, Grand Trunk, Canadian Northern Quebec, and Temiscouata railway companies, increasing rate on pulpwood from the provinces of Ontario, Quebec and New Brunswick to eastern United States points, effective Sept. 1 and 2, and reinstating the present rates. Upon its being represented to the railway companies that the going into effect of the said tariffs on Sept. 1 would be prejudicial to Canadian shippers of pulpwood, who had entered into contracts based on the lower rate, the companies voluntarily extended the effective date of the said tariffs until Nov. 1, and upon the hearing of the application it is ordered that the said tariffs be suspended until Feb. 4, 1913.

Embargoes Against Traffic.

General Order 95. Nov. 2.—Re circular 87, calling upon railway companies to show cause why an order should not go prohibiting them from issuing an embargo against any traffic for a period longer than four days, without first giving the Board at least ten days' previous notice of intention to issue such embargo, and the reason why such embargo is to be issued: It is ordered that whenever a railway company, subject to the Board's jurisdiction, issues an embargo against any traffic, it shall, within 48 hours thereafter, file with the Board a copy of such embargo, with a statement of the conditions rendering such embargo necessary, the action required to remove such conditions, and the probable time such embargo will be continued. And when such embargo is withdrawn or cancelled, the company shall forthwith file with the Board a copy of such withdrawal or cancellation.

Riding on Locomotive Pilots.—The Board of Railway Commissioners has, from time to time, received returns of a number of accidents resulting in serious, and, sometimes fatal injuries to employes through riding on locomotive pilots, and has requested railway companies to issue instructions that this practice, except when switching in yards, must be discontinued under penalty of being disciplined.

The Death of A. Lichtenhein.

The news of the death of A. Lichtenhein, the Galena-Signal Oil Co.'s contracting agent for Canada, at his home, the Poplars, New Rochelle, N.Y., on Oct. 31, came as a sad shock to his large body of friends, particularly among railway officials, from one end of the Dominion to the other, for as stated in the last issue of Canadian Railway and Marine World, he was believed to be satisfactorily recovering.

On Oct. 13 he complained of a pain in his abdomen. The family doctor diagnosed it as appendicitis, and on the following day Dr. Brewer, chief surgeon of the Roosevelt hospital, New York, operated on him. A slight attack of peritonitis followed, but he recovered from that, and as the wound healed perfectly there appeared to be every hope that he would pull through. But thromboses developed in the veins of the right arm, accompanied by septic poisoning, probably caused by the gangrene thrown

P307 The Late A. Lichtenhein.

into the blood from the appendix before its removal, and in spite of everything that could be done by four physicians, two of whom stayed continuously in the house, he succumbed.

He was born in New York city, Jan. 15, 1855, being one of a family of 11 children. His father died when he was two years old. He graduated from the high school at 13, and started work as runner in a bank. Then he became bookkeeper for a furrier, and while at that met Wm. Illsley, who induced him to try selling paint for Illsley, Doubleday & Co. Shortly afterwards he formed a partnership with J. L. Mott and the late A. W. Mott, as Dreker & Co., oil merchants, and succeeded in getting considerable Canadian business, putting their lubricating oils on several of the railway lines. But in the hard times of 1893 they found it advisable to sell out to the Galena Oil Co., and he became its contracting agent for Canada. In 1897 he was sent to Great Britain to introduce the Galena oils, and after being there about two years, recrossed the Atlantic and again took charge of the Canadian business, as the sole contracting agent, and made a great success of it. He married in 1883 Miss Frank Rogers, daughter of A. J. Rogers, who survives him, together with a daughter and a son.

"Lich," as he was affectionately termed by a host of warm personal friends among railway officials and others, was a most lovable character, kindly, generous, hospitable, even tempered, and always good natured. His devotion to his family was intense, their photographs were always in evidence in his rooms at the Windsor hotel, in Montreal, where he had his business headquarters, or wherever he might be staying, and not even a shooting or fishing trip, fond as he was of those sports, could keep him long away from them. He had a keen sense of appreciation of the beautiful, displaying this perhaps most particularly in regard to flowers, and when at home at New Rochelle in the summer, spent most of his time in his garden. He was also very fond of outdoor life generally, and was an ardent golfer.

The Galena-Signal Oil Co. sent out the following intimation:—"With profound sorrow we announce the death of Mr. A. Lichtenhein, on Thursday, the thirty-first day of October, at his home in New Rochelle, N.Y. His loyal and efficient services with this company for a period of over seventeen years speak more eloquently than words of his worth. His memory will be ever living in the hearts of his associates and his many friends."

Victoria and Sidney Railway Company

This company, which operates on Vancouver Island, and is a subsidiary of the Great Northern Ry., had gross earnings for the year ended June 30 of $59,713.63; operating expenses, $50,972.50; net earnings, $8,786.13.

The Victoria Terminal Ry. and Ferry Co.'s gross earnings were $5,236.51; operating expenses, $3,072.69; net earnings, $2,163.82.

The following are the directors and officers of both companies for the current year:—President, A. H. MacNeill, Vancouver, B.C.; Vice-President, L. C. Gilman, Seattle, Wash.; Sec.-Treas., A. M. Thomas, Seattle; Superintendent, A. F. Van Sant, Victoria, B.C.; other director, F. V. Brown, Seattle.

The question of the settlement of financial differences between the company and the city of Victoria is still under discussion.

Press reports state that an arrangement is being made under which the Canadian Northern Pacific Ry. will acquire the line, together with running rights on the mainland from Port Guichon, the landing point of the car ferry, and Vancouver.

Dominion Railway Subsidy Agreements.

The Dominion government has entered into subsidy agreements with the following companies for the construction of railways:—

Great Northern Mining and Ry. Co.—Sept. 12, from Little river through Belle Marche, to Eastern harbor, N.S., 3 miles.

Algoma Central and Hudson Bay Ry.—Sept. 27, from Sault Ste. Marie to the C.P.R. between White river and Dalton station, Ont., 200 miles.

Quebec Central Ry.—Sept. 25, from 30 miles from St. George, St. Justine parish, to Ste. Sabine parish, Que., 1.34 miles.

The Ontario Railway and Municipal Board's offices have been removed to the legislative buildings, Queen's Park, Toronto, from the Manning Chambers, Queen street west.

Railway Development.

Projected Lines, Surveys, Construction, Betterments, Etc.

Alberta, Peace River and Eastern Ry.—The Minister of Railways has approved of route map for this railway from Cochrane, Alta., to Edmonton and Peace river, 475 miles.

We are officially advised that it is proposed to start construction work at once on the section of the line between Duffield, Alta., about 40 miles west of Edmonton on the Grand Trunk Pacific Ry., to Peace River Landing, a distance of about 25 miles, and a branch line into Edmonton. The location plans for this portion of the line are practically completed and will be submitted to the Board of Railway Commissioners for approval at an early date. Arrangements are being made for the necessary plant and supplies and for the placing of construction contracts. It is expected to have this section of the line completed within two years.

Following are the officers and directors:—President, Lord Farrer, London, Eng.; Vice President, H. Muskett King, London, Eng., and Montreal; other directors:—Lord Vivian, London, Eng.; Hon. G. G. Wilson, York, Eng.; J. M. Synge, London, Eng.; F. Houlder, London, Eng.; F. W. Thompson, London, Eng.; F. A. Cochius, Baarn, Holland; E. G. Rykert, Montreal; Secretary and Treasurer, B. Maxfield, Edmonton, Alta.; Chief Engineer, J. H. Williams, M.I.C.E., Edmonton, Alta. (Aug., pg. 411.)

Algoma Central and Hudson Bay Ry.—The Algoma Central Terminals Co. has been incorporated under the Dominion Companies' Act to acquire land, lay out terminals, provide station and other buildings, and carry on various businesses in connection therewith. The capital is fixed at $100,000, and the office is at Sault Ste. Marie, Ont. The provisional directors are connected with the Lake Superior Corporation's legal office. (Nov., pg. 557.)

Algoma Eastern Ry.—The Algoma Eastern Terminals Co. has been incorporated under the Dominion Companies' Act, for similar objects and with similar powers to the Algoma Central Terminals Co. The capital is also $100,000; the office is at Sault Ste. Marie, Ont., and the provisional directors are the same as the A.C.T. Co.

Application is being made to the Dominion Parliament to extend the time for the completion of the Sudbury-Little Current section of the line. (Nov., pg. 557.)

We are advised that a contract has been let to the Foundation Co., Montreal, for the sub-structure of a bridge from Goat island to Manitoulin island, at Little Current, Ont. The work will consist of four piers and two abutments carried down to rock. The maximum depth of water is about 28 ft. The piers will be constructed by the open caisson method.

All Red Line Ry.—Application is being made to the Dominion Parliament to incorporate a company with this title to build a railway from the eastern boundary of Quebec province to Winnipeg, and branch lines into Quebec city, Montreal, Ottawa, Fort William or Port Arthur. Bicknell, Bain, Strathy and Mackelcan, Toronto, are solicitors for applicants.

Alma and Jonquieres Ry.—The Quebec Legislature is being asked to incorporate a company with this title to build the following lines of railway:—from Hebertville on the Quebec and Lake St. John Ry. northerly to Lake St. John between Grande Discharge and Petite Discharge, Que., 20 miles; from St. Joseph d'Alma easterly to Jonquieres, 30 miles. Cannon and Parent, Quebec, are solicitors for applicants.

Athabaska Northern Ry.—Application is being made to the Dominion Parliament to declare the company's corporate powers to be in full force and to extend the time within which the line from Edmonton to Athabaska Landing, Alta., authorized to be built by the statutes of 1905 may be constructed. Smith, Markey, Skinner, Pugsley and Hyde, Montreal, are solicitors for applicants.

British Columbia and Alaska Ry.—Press reports from Fort George, B.C., Nov. 11, state that engineers have, after some months' work, completed the location of this projected railway to Summit lake, near there, and have suspended work for the season. (Jan., pg. 21.)

Cape Breton Coal, Iron and Ry. Co.—H. Mayhew, President, is reported as recently stating in Sydney, N.S., that the company expects shortly to start work on the extension of its railway to Mira, where shipping piers are to be built. The present line extends from the collieries at Broughton to a junction with the Sydney and Louisburg Ry.

Cariboo, Barkerville and Willow river Ry.—Application is being made to the Dominion parliament to extend the time for the construction of the line authorized to be built by chap. 64 of the statutes of 1911, and to authorize the building of the following additional lines: From Barkerville to the junction of the Clearwater and North Thompson rivers; from about 17 miles from the northerly terminus easterly to Bear river, about 20 miles.

Central Ry. of Canada.—Application is being made to the Dominion Parliament to confirm transfers and agreements made between the company and the following companies:—Ottawa River Ry., Central Counties Ry., Great Eastern Ry., Ottawa Valley Ry., Carrillon and Grenville Ry., and Ottawa River Navigation Co., and to amalgamate them with the C. Ry. of Canada; to extend the time for the building of the various lines authorized; to increase the company's bonding powers; to authorize the company to enter into agreements with other railway companies named, and to build the following additional lines:—from Laval county to Lake St. Mary, Argenteuil county, Que.; from the main line to St. Scholastique, Two Mountains county, Que.; through Hochelaga, Chambly, Verecheres and St. Hyacinthe counties to St. Rosche, on the Intercolonial Ry.; from the last named line through La Prairie and Napierville to the Intercolonial Ry. in the county of St. Johns; from Orillia to Goderich, Ont., connecting in Perth county with the line already authorized to be built to Port Stanley, Ont. (Nov., pg. 557.)

The Board of Railway Commissioners has approved location plans for the company's line in Montreal, mileage 0 to 5, on condition that the grade crossing at St. Michels road be eliminated.

Dominion Atlantic Ry.—In an interview at Montreal, Oct. 30, Sir Thos. Shaughnessy is reported to have said that all the bridges on the line are being renewed as fast as possible. The track will be relaid with heavier rails, and everything will be brought up to C.P.R. standards. He expects that the entire work will be completed within two years. He could make no statement as to the company's entrance into Halifax. At present the D.A. Ry. operates the Windsor branch of the Intercolonial Ry. under an agreement, thus securing an entrance to Halifax. (Nov., pg. 557.)

Dominion North Western Ry.—Application is being made to the Dominion parliament to incorporate a company with this title to build a railway from Regina, Sask., westward to Tuxford on the C.P.R., thence to Red Deer, Alta., with a branch through Battleford, Sask., to Fort McKay. M. J. O'Connor, Ottawa, is solicitor for applicants.

Edmonton, Dunvegan and British Columbia Ry.—Tracklaying is reported to have been started on the section of the line from Edmonton to Athabaska Landing, Alta, 120 miles. The rails for this section are about all delivered, and a contract for the last 100,000 ties required is reported let to Bell and McPhee. (Nov., pg. 557.)

Erie, London and Tillsonburg Ry.—The Minister of Railways has approved a route map of the section of this projected railway between London and Aylmer, Ont., 19 miles. (Nov., pg. 557.)

Esquimalt and Nanaimo Ry.—A contract is reported to have been let to Moore and Pethick, Victoria, for the grading of the Comox extension from the Big Qualicum river for 19.29 miles. This is the final contract on the extension from McBride Jct., along the east coast of Vancouver Island, to Courtenay in the Comox valley, 45 miles. Grading has been practically completed on 15 miles out of McBride Jct., and on 10 miles southerly from Courtenay. (Nov., pg. 557.)

Ha Ha Bay Ry.—See Roberval and Saguenay Ry. (Oct., pg. 501.)

Gananoque to Elgin, Ont.—The question of the construction of a railway from Gananoque to a junction with the Canadian Northern Ontario Ry. at Elgin, Ont., is under consideration, and a syndicate headed by J. C. Judd, Morton, Ont., has been formed to have surveys made.

Huron and Ontario Ry.—Application is being made to the Dominion Parliament to extend the time within which the company may build the lines authorized by the statutes of 1911, and previous acts referred to therein. T. H. Kilgore, Toronto, is Secretary. (June, 1911, pg. 555.)

Intercolonial Ry.—Speaking at Halifax, N.S., Oct. 30, the Minister of Railways is reported to have stated that it is the intention of the Dominion Government to build new railway and ocean terminals about two miles south of the present terminals. The new docks are to extend for a mile and a half from the lumber yard to Point Pleasant park, and will consist of six piers each 1,250 by 300 ft., with one bulkhead landing pier 2,000 ft. long. This pier will have on it the immigration buildings, and will be used for landing passengers from the ocean liners. The immigration buildings and a grain elevator will also be located on it. At the other docks there will be accommodation for 30 ocean going steamers. The new terminals will be approached by a double track line which will branch from the main line at the Three Mile House, extend southerly through the low divide between Bedford Basin and the northwest arm, finally reaching the terminals under the lower end of Young avenue. The streets in the residential part of the city will be carried over the line by bridges. A new union station will be erected at the end of Hollis street, just north of the docks. The plans also include the raising of the breakwater at the lighthouse so as to give quiet water inside.

The Minister of Railways is reported to have informed a Truro, N.S., deputation, Oct. 30, that arrangements had been made to have an engineer go to Stewiacke as soon as possible to run a trial survey for the suggested line from Truro to Deane, and make an estimate of the probable cost of construction, and of the possible traffic. (Nov., pg. 557.)

Kettle Valley Lines.—A contract is reported let to W. Bouthron, Grand Forks, B.C., for the erection of station and other buildings on the Penticton section.

The line is under construction out of Penticton through the Okanagan valley. The work in the vicinity of Naramorta is reported to be very heavy, as it includes an 1,800 ft. and a 200 ft. tunnel, a lot of rock cutting and a switchback. (Nov., pg. 558.)

The Dominion parliament is being asked to pass an act authorizing the company to enter into an agreement with the C.P.R.; extending the time for the construction of the lines authorized to be built, and giving power to build the following additional lines:—From near Summer's creek to various mining camps about 15 miles southwest to Princeton, B.C.; from Vernon southerly through Kelowna to near Penticton, B.C.; from the terminus of the branch authorized by sec. 2h, chap. 101 of the statutes of 1911 to the Otter summit about 30 miles south of Merritt, and from near Tulameen for about 50 miles up the Tulameen valley.

The Board of Railway Commissioners has authorized the opening for traffic of the portion of the line from Merritt, B.C., easterly for 29 miles.

The Spokane and British Columbia Ry., which is the section of these lines in the United States, proposes to build an extension to Spokane, Wash. It is reported that surveys are being made, and that construction will be started as soon as these are completed. The K.V. lines have recently come under the control of the C.P.R.

L'Avenir and Melbourne Ry.—Application is being made to the Quebec Legislature to amend the charter by changing its name and extending the time within which the line authorized to be built may be constructed. B. E. Reid, G. H. Bogie and J. Laferty are interested. Berque, Berque and Berque are solicitors for the company, and the additional applicants named. (June, pg. 300.)

Little Nation Ry.—The Quebec Legislature is being asked to extend the time within which the lines authorized to be built by the act of 1907, as amended by the act of 1910, may be constructed. (June, pg. 300.)

Michigan Central Rd.—Press reports state that it has been decided to proceed with the erection of a new machine shop and power house at St. Thomas, Ont., in the spring. (Oct., pg. 502.)

Montreal Manufacturer's Terminal.—Application is being made to the Dominion Government to incorporate a company with this title to lay out a terminal property on the St. Lawrence river, between Notre Dame street east and the river front, near Longue Pointe, Montreal. The company proposes to lay out the property on the lines of the Bush terminal at Brooklyn, N.Y.

North Ry.—A number of the engineers engaged on the survey of this projected railway from Montreal to the mouth of the Nottaway river on James Bay, have returned to Montreal, while E. A. Evans, M. Can. Soc. C.E., who represented the Quebec Government on the party which was surveying the bay end, returned to Quebec Oct. 25. It was expected to complete location plans for the line from the Nottaway river mouth to the crossing of the National Transcontinental Ry. at Bell river. The engineers are reported to have stated that only in a few instances will there be a maximum gradient of 0.25% eastbound, and that there are no difficulties in the way of construction. It is stated that contracts will be let for the building of this division by Jan. 1, and that the specifications will call for its completion by Oct. 1, 1914. The location of the route from Montreal to Bell river presents more difficulties, and it is not expected that the location surveys will be completed until the spring. The route from Bell river as far south as Grand Victoria has been located and it is reported that construction on this section will be started simultaneously with that north of Bell river. (Nov., pg. 558.)

Northern Territorial Ry.—It is reported that two engineering parties are in the field north of Edmonton, Alta., making preliminary surveys for this projected railway. H. G. N. Neville, who is Chief Engineer, is expected to return to Edmonton in the spring. (Aug., pg. 412.)

Pacific and Hudson Bay Ry.—Press reports state that J. M. Ralston has returned to Bella Coola, B.C., after having completed a preliminary survey of the projected line as far as Fort Dunvegan. The line decided upon is said to be from Bella Coola to Fort Fraser, where it will cross the Grand Trunk Pacific Ry., thence to Fort St. James, to Fort McLeod, through the Pine river pass and down the Pine river to Fort Dunvegan. In all, the route as surveyed covers some 480 miles. (Oct., pg. 502.)

Pacific Great Eastern Ry.—We have been officially advised that P. Welch has been awarded the contract for the building of this railway, and that he has started work at Lillooet, B.C. As a consequence he has resigned office as Vice President. His successor in that office has not yet been appointed. A. Kellett, the contractor's superintendent at Lillooet, is reported to be arranging for the letting of subcontracts on the line northwesterly.

The property of the Howe Sound and Northern Ry. was taken over by the P.G.E. Ry., Nov. 9. The purchase, we are officially advised, includes all the constructed line, about 12 miles, rolling stock, surveys for extensions, good will, and all assets of every description. The miscellaneous assets include 3,000 ft. of waterfront at the head of Howe sound, and the unsold portion, approximately one half of the townsite of Newport, belonging to the Howe Sound Development Co. The purchase of this line simplifies the construction of the P.G.E. Ry. between Vancouver and Lillooet. The route maps for this section of the line are being considered by the Provincial Minister of Railways. E. White has been placed in charge of the contractor's office at Vancouver, and will have charge of construction between that point and Lillooet. (Nov., pg. 558.)

The Pacific Great Eastern Development Co. has been incorporated under the British Columbia Companies' Act to develop lands and other resources along the route of the P.G.E. Ry. The capital is fixed at $250,000, and the provisional directors are:—T. Foley, P. Welch, J. W. Stewart and D. A. Tate.

Peace River Great Western Ry.—Edmonton, Alta., press reports state that the charter of this company has been acquired by French financial interests, and the Provincial Secretary is reported as stating that plans have been filed and that construction will be started in the spring. The line is projected from Edmonton northwesterly to the west end of Lesser Slave Lake, on to the Peace River Crossing, thence to Dunvegan. (Feb., 1911, pg. 113.)

Quebec Central Ry.—We are officially advised that the 1.34 miles of line from a point 30 miles from St. George to St. Sabine, for which a contract under the Dominion act granting subsidies in aid of certain railways was recently entered into, is an extension of the Chaudiere Valley-Cobans extension. The piece of line has been built, and has been in operation since Jan. 2, 1911. (June, pg. 301.)

Quebec Rapid Transit Ry.—The Dominion Parliament is being asked to incorporate a company with this title to build a railway from Quebec easterly to St. Gregorie de Montmorency, northwesterly to Lake St. Charles; southerly to Cap Rouge, and thence easterly to Quebec, being a belt line through the county of Quebec, with branch lines, and to operate vessels in connection therewith, the line to be operated by steam, electricity or any other power. A. Taschereau, Quebec, is solicitor for applicants.

Quebec, Portland and International Short Line Ry.—Application is being made to the Dominion parliament to incorporate a company with this title to build a railway from La Patrie, Que., to the International boundary line, thence along the valley of the North river to a junction with the Maine Central Rd., or the C.P.R. in Eaton township. Pringle, Thompson and Burgess, Ottawa, are solicitors for applicants.

Roberval and Saguenay Ry.—The Quebec legislature is being asked to pass an act changing the name to La Compagnie de Chemin de Fer Le Nord; authorizing the building of branches; authorizing the acquisition of the Ha Ha Bay Ry., charters, lines and property, together with power to extend this line from the Chicoutimi Pulp Co.'s mills to the confluence of the Riviere du Moulin with the Saguenay river; and fixing the amount of bonds to be issued. (May, pg. 240.)

Simcoe, Grey and Bruce Ry.—Application is being made to the Dominion parliament to extend the time within which this projected line may be built. B. Allen, Owen Sound, Ont., is Secretary. (June, pg. 302.)

Timiskaming and Northern Ontario Ry.—Track is reported to have been laid on the Elk lake branch to Jean Baptiste river, 12 miles. The bridge across the river has been completed and track is being laid on to the Montreal river, 10 miles. The bridge over this river is in course of erection, and it is expected to have it completed so that track can be laid into Elk Lake city by Dec. 31. (Nov., pg. 558.)

J. L. Englehart, Chairman of the Commission, is reported as stating that 20 miles of track have been laid on the Elk Lake branch, leaving 10 miles yet to be laid. The piers and cofferdam for the bridge over the Montreal river have been completed, and the steel work is being assembled.

The Ontario Government survey party returned to Cochrane, Nov. 5, after having completed the preliminary survey for the projected extension of the line to Hudson bay. The party, which was headed by W. R. Maher, has laid out a road to Moose Factory, at which point surveys have been made for a harbor by J. E. McMillan. The reports are being prepared for the government, but it is not expected that anything will be done in the way of construction for some time. (Nov., pg. 558.)

Western Dominion Ry.—A meeting of shareholders of the Alberta Pacific Ry. was held at Pincher Creek, Alta., Nov. 2, for the purpose of approving the sale of the company's property to the W.D. Ry. Co. The A.P. Ry. Co. was incorporated by the Alberta legislature, and the W.D. Ry. Co. has a Dominion charter and is controlled by the same interests. Recent Calgary press reports state that the W.D. Ry. Co. is a subsidiary of the Chicago, Milwaukee and St. Paul Rd. (Nov., pg. 559.)

Wetaskiwin, Yellowhead and Revelstoke Ry.—Application is being made to the Dominion parliament to incorporate a company with this title to build a railway from Wetaskiwin, Alta., westerly to the Saskatchewan river, thence following the Brazeau river valley to its headquarters, then along the Rocky river valley to the Yellowhead, thence westerly and southwesterly along the valleys of the Caure and Columbia rivers to Revelstoke, B.C. Loggie and Manley, Wetaskiwin, Alta., are solicitors for applicants.

Transportation Appointments Throughout Canada.

Allan Steamship Line.—H. F. BRADLEY, heretofore Assistant Passenger Manager, has been appointed Passenger Manager, vice G. H. Hannah, retired. Office, Montreal.

Bangor and Aroostook Rd.—ARTHUR HOLLAND has been elected President, vice F. W. Cram, resigned. Office, Bangor, Me. The office of General Assistant, formerly held by W. F. Cram, has been abolished.

Canadian Northern Ontario Ry.—Press reports state that W. A. BROWN, Superintendent Canadian Northern Ry. at Edmonton, Alta., is to be transferred to a similar position on the C.N.O.R. at Toronto. Up to Nov. 25 this had not been officially confirmed.

Canadian Northern Ry.—F. W. HARGRAVE, heretofore chief clerk to Purchasing Agent, has been appointed Assistant Purchasing Agent. Office, Winnipeg.

C. J. WILSON has been appointed Superintendent, district 3. Office, Winnipeg. Former district 3 is now designated as district 4 and remains under the jurisdiction of W. E. Roberts, Superintendent, Brandon, Man.

Canadian Northern Steamships, Ltd.—In consequence of the running aground of the s.s. Royal George near Quebec and the necessity of laying her off for repairs, considerable reductions have been made in the company's staff at various points. The position of General Agent at Montreal, heretofore held by J. H. HOSEASON, and that of Travelling Immigration Agent, heretofore held by J. F. SOUTHALL, have been abolished.

Canadian Pacific Ry.—H. C. GROUT, heretofore Superintendent, district 1, Atlantic division, Brownville Jct., Me., has been appointed Assistant General Superintendent, Atlantic division. Office, St. John, N.B.

N. R. DES BRISAY, Travelling Freight Agent for the maritime provinces, with headquarters at St. John, N.B., has resigned. No successor has yet been appointed.

H. FRAWLEY, heretofore Locomotive Foreman, Ottawa, Ont., has been appointed Locomotive Foreman, Farnham, Que., vice H. A. Amy, transferred to Schreiber, Ont.

C. HENDERSON, heretofore conductor, has been appointed Trainmaster, district 2, Atlantic division. Office, Aroostook junction, N.B.

H. IRWIN, M. Can. Soc. C.E., heretofore Right of Way and Lease Agent, has been appointed Consulting Right of Way and Lease Agent. Office, Montreal.

F. TAYLOR, M. Can. Soc. C.E., heretofore Division Engineer, Eastern division, has been appointed Right of Way and Lease Agent, vice H. Irwin. Office, Montreal.

E. J. BOSWELL, A.M. Can. Soc. C.E., has been appointed Assistant Right of Way and Lease Agent. Office, Montreal.

F. W. COOPER, A.M. Can. Soc. C.E., heretofore Assistant Engineer, has been appointed Division Engineer, Eastern division, vice F. Taylor. Office, Montreal.

S. B. McCONNELL, heretofore Assistant Division Engineer, has been appointed Assistant Engineer, vice F. W. Cooper. Office, Montreal.

T. BELL, heretofore chief clerk, Advertising Dept., has been appointed Assistant General Advertising Agent. Office, Montreal.

G. R. B. WATT has been appointed chief clerk, Advertising Dept., vice T. Bell.

J. WILKINSON, heretofore Locomotive Foreman, Hochelaga, Montreal, has been appointed Locomotive Foreman, Outremont, Montreal, vice R. H. McDonald, transferred.

R. H. McDONALD, heretofore Locomotive Foreman, Outremont, Montreal, has been appointed Locomotive Foreman, Ottawa, Ont., vice H. Frawley.

V. T. BROUGHTON has been appointed Resident Engineer at Chapleau, Ont., vice S. W. Shackell, resigned.

H. A. AMY, heretofore Locomotive Foreman, Farnham, Que., has been appointed Locomotive Foreman, Schrieber, Ont., vice J. F. Gildea, transferred.

R. ANDREWS, heretofore Agent, Sleeping, Dining and Parlor Cars and News Service, Calgary, has been appointed Assistant Superintendent same department. Office, Calgary, Alta.

J. H. McNEILL, heretofore Inspector, Sleeping, Dining and Parlor Cars and News Service, has been appointed Agent same department, Calgary, Alta., vice R. Andrews, promoted.

T. H. HORTON has been appointed Storekeeper, Crowsnest, B.C. This is a new position.

A. E. BENNETTS, heretofore Locomotive Foreman, Kamloops, B.C., has been appointed Locomotive Foreman, Eholt, B.C., vice A. W. Clark, transferred.

H. Irwin, M. Can. Soc. C.E., Consulting Right of Way and Lease Agent, C.P.R.

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T. KILPATRICK, Superintendent district 1, British Columbia division, Revelstoke, is reported to have resigned.

A. W. CLARK, heretofore Locomotive Foreman, Eholt, B.C., has been appointed Locomotive Foreman, Kamloops, B.C., vice A. E. Bennetts, transferred.

R. HOWARD, heretofore Yardmaster, Vancouver, has been appointed Trainmaster, in charge of train service, etc., on double track between Hammond and Ruby Creek. Headquarters, Agassiz, B.C.

Chicago, St. Paul, Minneapolis and Omaha Ry.—G. A. LEE, heretofore General Agent, Winnipeg, has been appointed Assistant General Passenger Agent, Minneapolis, Minn.

H. M. McGINNIS, heretofore Travelling Agent, Vancouver, has been appointed General Agent, Winnipeg, vice G. A. Lee, promoted.

Delaware and Hudson Co.—D. B. HORN has been appointed Assistant Manager Dining Service Department, the office of Superintendent of Dining Service having been abolished. Office, Albany, N.Y.

M. J. HAGADORN has been appointed Commissary Agent, vice D. B. Horn. Office, Plattsburg, N.Y.

Grand Trunk Pacific Ry.—R. J. DALLAS has been appointed Trainmaster, 1st, 2nd, 3rd districts and Yorkton Branch. Office, Melville, Sask.

Grand Trunk Ry.—A. E. ROSEVEAR, heretofore Assistant General Freight Agent, has been appointed Assistant to Vice President J. E. Dalrymple, in charge of freight and passenger traffic, with the title of Assistant to Vice President. Office, Montreal.

C. A. DUNHAM, heretofore Signal Engineer, Great Northern Ry., has been appointed Signal Engineer, G.T.R. Office, Montreal.

W. H. PATTON, heretofore Signal Engineer, Toronto, has been appointed Supervisor of Signals. Office, Toronto.

A press report states that J. B. GANT, heretofore Inspector of Bridges, Illinois Central Rd., has been appointed to a similar position with the G.T.R. at Montreal.

A. D. McCARTHY has been appointed Trainmaster, 4th district and Montreal Terminals. Headquarters, Montreal. The General Yardmaster and Freight Agent, Montreal Terminals, will report to Assistant Superintendent, as heretofore.

N. FOY, heretofore conductor, has been appointed station master, Bonaventure station, Montreal. He will have jurisdiction over all train, yard, enginemen and other employes.

W. R. GERMAIN has been appointed assistant station master, Bonaventure station, Montreal.

G. A. STOKES, heretofore General Yardmaster, Toronto, has been appointed Acting Terminal Superintendent, Toronto, vice W. H. Farrell, assigned to other duties.

R. MUIRHEAD, heretofore Assistant Yardmaster, Toronto Terminals, has been appointed General Yardmaster, succeeding G. A. Stokes, promoted. Office, Toronto.

W. C. SEALY, heretofore General Foreman, Toronto shops, has been appointed Assistant Master Mechanic, Middle and Southern divisions. Office, Toronto.

G. M. WILSON, heretofore in charge of installation of machinery for power house, central station, Ottawa, has been appointed General Foreman, Toronto shops, vice W. C. Sealy, promoted.

W. HALL, heretofore Rule Instructor, Sarnia, Ont., has been appointed Assistant Trainmaster, Hamilton, Ont., vice L. Harold, assigned to other duties.

W. LANG, heretofore Night Car Distributor, London, Ont., has been appointed Car Distributor, Stratford, Ont., vice J. E. Van Kuren.

H. A. WELCH has been appointed Night Car Distributor, London, Ont., vice W. Lang.

E. R. VREELAND has been appointed depot master, Brush street station, Detroit, Mich., vice A. J. Donohue, deceased.

Intercolonial Ry.—A. DUNN, heretofore trick dispatcher, Moncton, N.B., has been appointed Chief Dispatcher, Sydney, N.S., vice H. V. Musgrave, Acting Chief Dispatcher.

K. STEWART, heretofore trick dispatcher, New Glasgow, N.S., has been appointed Chief Dispatcher there.

W. B. MACKENZIE, M. Can. Soc. C.E., heretofore Chief Engineer, has been appointed Right of Way and Lease Agent. The position of Chief Engineer has been abolished.

R. COLCLOUGH, heretofore Assistant Superintendent, Halifax and St. John district, has been appointed Assistant to the General Superintendent. Office, Moncton, N.B.

H. B. FLEMING, heretofore Chief Dispatcher, Moncton, N.B., has been appointed

Assistant Superintendent, Halifax and St. John District. Office, Moncton, N.B.

W. E. BARNES, heretofore acting Master Mechanic, Moncton, N.B., has been appointed Master Mechanic there.

H. W. SHARP has been appointed acting Master Mechanic, Riviere du Loup, Que., vice T. Ryan, assigned to other duties.

Michigan Central Rd.—E. C. KEENAN has been appointed General Superintendent Telegraph. Office, Chicago, Ill.

Minneapolis, St. Paul and Sault Ste. Marie Ry.—R. KIRKWOOD has been appointed acting Auditor, vice R. Toombs, deceased. Office, Minneapolis, Minn.

National Transcontinental Ry.—W. B. Cronk, heretofore Superintendent of Transportation, Winnipeg, has been appointed General Superintendent. Office, Ottawa.

E. P. CRONK has been appointed Superintendent New Brunswick division, N.T.R. Office, Edmunston, N.B.

New York Central and Hudson River Rd.—J. P. DALY, heretofore General Freight and Passenger Agent, Ottawa and New York Ry., has been appointed chief clerk to Division Freight Agent, N.Y.C. & H.R.R., Buffalo, N.Y.

Ottawa and New York Ry.—G. H. CLARK, heretofore Division Freight Agent, New York Central and Hudson River Rd., Utica, N.Y., has been appointed General Freight and Passenger Agent, O. & N.Y.R., vice J. P. Daly.

W. L. GRENIER has been appointed Commercial Agent at Salt Lake, Utah, for the O. & N.Y.R., as well as other New York Central lines, vice K. O. Keyes, resigned.

Pacific Great Eastern Ry.—A press report states that A. H. SPERRY, heretofore Assistant General Freight and Passenger Agent, Spokane International Railway, has been appointed in charge of the Pacific Great Eastern, with office at Newport, B.C.

Pere Marquette Rd.—C. B. WILKIE, heretofore locomotive engineer, has been appointed Road Foreman of Engines, Canadian division. Office, Port Huron, Mich.

A press report states that W. K. Tasker, Superintendent Buffalo Division, has had his office removed from Port Huron, Mich., to St. Thomas, Ont.

W. H. ROURKE, heretofore Master Car Builder, has been appointed Chief Inspector Car Department. Office, Grand Rapids, Mich.

Sydney and Louisburg Ry.—D. H. McDOUGALL, heretofore Assistant General Manager, Dominion Coal Co., which owns the S. & L. Ry., has been appointed General Manager, vice M. J. Butler, resigned.

Wabash Rd.—G. C. KNICKERBOCKER, heretofore Travelling Freight Agent, Buffalo, N.Y., has been appointed Division Freight and Passenger Agent, Danville, Ills., vice W. A. Sprott, deceased.

R. A. BROWN, heretofore Contracting Freight Agent, Minneapolis, Minn., has been appointed Travelling Freight Agent, Buffalo, N.Y., vice G. C. Knickerbocker, promoted. He will report to J. J. Mossmann, General Agent, Buffalo.

Mainly About Transportation People.

SIR THOS. TAIT has taken an apartment in the Linton, at Montreal.

N. CURRY, President, Canadian Car and Foundry Co., has been appointed a Senator.

J. A. McKEE, President, Western Steamship Co., Toronto, died there suddenly Nov. 18.

G. M. BOSWORTH, Vice President, C.P.R., and Mrs. Bosworth, arrived in England early in November.

A. H. MORRILL, M. Am. Soc. C.E., has been appointed Engineer of Construction, Boston & Maine Rd.

E. H. FITZHUGH, President, Central Vermont Ry., denied, Nov. 17, press reports that he was about to resign.

H. J. FULLER, President, Canadian-Fairbanks-Morse Co., Ltd., has been elected a director of the National Trust Co.

W. M. RAMSAY, insurance broker, who died in Montreal Nov. 13, aged 78, was a director of the Montreal Warehousing Co.

C. A. GRISCOM, chairman of the board of directors of the International Mercantile Marine Co., died at Philadelphia, Pa., Nov. 10.

SAMUEL REA, heretofore Vice President, Pennsylvania Rd., has been elected President, vice J. McCrea, resigned on account of age.

SIR WM. C. VAN HORNE arrived in Winnipeg Nov. 11, visited his farm at Selkirk on the following day, and returned east Nov. 13.

W. E. STAVERT, formerly of the Bank of Montreal, has been elected President, Alaska Northern Ry., vice O. G. Labert, resigned.

D. McLEOD VINCE, D.C.L., K.C., Chairman of the New Brunswick Public Utilities Commission, died at Woodstock, N.B., Nov. 25, aged 64.

Miss Gladys Wainwright, daughter of W. WAINWRIGHT, Vice-President G.T.R. & G.T.P.R., is one of the season's debutantes in Montreal.

SIR WM. WHYTE has been elected President of the Winnipeg St. Andrew's Society, and occupied the chair at the annual meeting Nov. 14.

R. CROASDELL, Publicity Agent, Canadian Northern Ry., Toronto, is recovering from the effects of a recent serious operation.

Mrs. Holt, wife of T. G. HOLT, Executive Agent, Canadian Northern Ry., Vancouver, B.C., has returned home after a lengthened trip to Great Britain.

JAS. LEITCH, K.C., heretofore Chairman of the Ontario Railway and Municipal Board, has been appointed a Judge of the High Court of Ontario.

CAPT. MURRAY, of the C.P.R. steamship Empress of Britain, was presented with a silver service by the members of the victualling department Nov. 11.

P. H. HUME, civil engineer, who was associated with Mr. Connoly in the new wharf construction at St. John, N.B., died there, after a lengthened illness, Nov. 1.

Mrs. J. C. O'Donahoe, who died at Ottawa Nov. 12, was mother of J. V. O'DONAHOE, assistant to the General Manager, Richelieu and Ontario Navigation Co., Montreal.

T. E. DUNNE, formerly Intercolonial Ry. ticket agent at Pictou, N.S., and son of B. J. Dunne, Inspector of Police, Intercolonial Ry., died at Parkland, Alta., recently.

M. J. BUTLER, M. Can. Soc. C.E., formerly Deputy Minister of Railways and Canals, has resigned the general managership of the Dominion Steel Corporation at Sydney, N.S.

W. H. CUMMINGS, who has been in charge of the Grand Trunk Ry. exhibit at the Crystal Palace in England during the last two seasons, returned to Canada early in November.

D. McINTYRE, K.C., Kingston, Ont., has been appointed chairman of the Ontario Railway and Municipal Board in succession to Jas. Leitch, K.C., appointed a judge of the Ontario High Court.

MOTT SAWYER, formerly Superintendent, Bellingham Bay and British Columbia Rd., has been appointed Superintendent of Construction, Chicago, Milwaukee and Puget Sound, Ry., at Lewiston, Mont.

LORD STRATHCONA has been given the Royal Society of Arts medal for services in improving railway communication, in developing Canadian resources and commerce, and for services to the Empire in general.

P. CLARKE, Vice-President, Westholme Lumber Co., which carried out several contracts for what is now the Canadian North Eastern Ry., at Port Stewart, B.C., died at Seattle, Wash., Nov. 4, aged 47.

M. CAIN, for 55 years baggage agent at Newmarket, Ont., first with the old Northern Ry., and subsequently with its successor, the G.T.R., died there Nov. 16, aged 65. He retired from active service in 1908.

SIR EDWARD CLOUSTON, who died in Montreal, Nov. 23, was formerly President Montreal Rolling Mills and also a director of the Alberta Railway and Irrigation Co. and the Cumberland Railway and Coal Co.

The Winnipeg Free Press, of Oct. 30, says that thirty years ago, viz., Oct. 30, 1882, M. J. HANEY, M. Can. Soc. C.E., now of Toronto, resigned the superintendency of the C.P.R.'s Pembina and Rat Portage divisions.

The Montreal Star recalls the fact that on Nov. 1, 1882, SIR THOS. G. SHAUGHNESSY arrived in Montreal to take up the duties of the position of General Purchasing Agent of the C.P.R., of which he is now President.

C. A. BOWMAN, of the engineering staff of the Department of Railways and Canals, Ottawa, was presented with a gold watch by the staff, Nov. 7, prior to leaving for a trip to Great Britain, where he will spend the winter.

GEO. LEE, who has been General Agent for the Chicago Northwestern Rd. in Winnipeg for some time, was presented with a gold watch and chain, Oct. 29, on his removal to Minneapolis, Minn., to another position in the company's service.

JOHN HALSTEAD, Division Freight Agent, C.P.R., Calgary, Alta., was married at Edmonton, Oct. 30, to Miss M. E. Riley, daughter of the late T. Riley, of Hounsfield Lodge, Calgary. Mr. and Mrs. Halstead spent their honeymoon in California.

CAPT. M. IRONSIDES, a well known lake mariner, died in the marine hospital, Goderich, Nov. 10, from bloodpoisoning, resulting from one of his legs being squeezed in a winch cable while his vessel was passing through the Sault Ste. Marie canal recently.

J. GAULT KINGSMILL, son of the late Nichol Kingsmill, K.C., formerly Canadian Solicitor, Michigan Central Rd., was married in Toronto, Nov. 10, to Miss Beatrice Tate, daughter of the late R. F. Tate, M. Can. Soc. C.E., of Mackenzie, Mann & Co.'s staff.

W. ROBINSON, who has been Travelling Passenger Agent, Grand Trunk Ry., with headquarters at Pittsburg, Pa., since June 1, 1906, died there of pneumonia early in November and was buried at Niagara Falls. He was formerly in the Intercolonial Ry. service.

W. A. HARRIS, station agent for the Intercolonial Ry. and the Dominion Atlantic Ry. at Windsor Jct., N.S., died there Nov. 14. He had been in the employ of the Dominion Government railways for 40 years, for 32 of which he was agent at Windsor Jct.

THOMAS BELL, who has been appointed Assistant General Advertising Agent, Canadian Pacific Ry., has been in the company's service since 1895, when he started as office

boy. He will relieve the General Advertising Agent of much of the company's exhibition work.

R. T. WHEELER, M. Am. Soc. C.E., heretofore Engineer of Construction, New York, New Haven and Hartford Rd., and Boston and Maine Rd., and Chief Engineer of the Boston Terminal Co., Boston, Mass., has been appointed Chief Engineer, Maine Central Rd., at Portland, Me.

A. H. SPERRY, who resigned his position as Assistant General Freight and Passenger Agent, Spokane International Ry., recently to enter the Pacific and Great Eastern Ry.'s service in British Columbia, was entertained at a farewell dinner by railway men in Spokane, Wash.

The death, on Nov. 8, of REUBEN WELLS, for many years Superintendent of the Rogers Locomotive Works, at Paterson, N.J.; removes another one of the group of men who had most to do with the development of American locomotive engineering during the '80's and '90's. He was 83 years old.

PAUL SEUROT, M. Can. Soc. C.E., M. Am. Soc. C.E., chief engineer in Montreal for Jacobs and Davies, Inc., consulting engineers, New York and London, Eng., has been awarded a Telford premium of the Institution of Civil Engineers of Great Britain for a paper published in its proceedings for 1911-1912.

W. McILROY was presented with a purse of gold and a gold locket by the members of the Peterboro Club, and a gold watch fob by the members of the Belmont Club, on his recent transfer from the position of C.P.R. town ticket agent at Peterboro, Ont., to that of C.P.R. city ticket agent at Hamilton, Ont.

C. B. CONGER, Treasurer, and one of the founders of the Travelling Engineers' Association, and its first President, having presided over the convention at Chicago in 1893; at Denver, Col., in 1894; at Pittsburgh, Pa., in 1895; at Minneapolis, Minn., in 1896, and Chicago in 1897, died on October 29, aged 65.

R. W. SHEPHERD, for 35 years manager of the Ottawa River Navigation Co., died suddenly in the Queen's Hotel, Montreal, Nov. 8. He entered the company's employ on leaving school, and succeeded his father as manager, from which position he retired about three years ago. H. Shepherd, a railway contractor in Alberta, is a son.

W. D. TRUMP, formerly General Superintendent, Pere Marquette Rd., has been appointed Manager, Detroit Terminal Rd., at Detroit, Mich. The Detroit Terminal is owned by the Grand Trunk, Michigan Central and Lake Shore and Michigan Southern lines. It was previously operated jointly, but is now under separate management.

P. LYALL, President of P. Lyall and Sons, Limited, Montreal, died in that city Nov. 14, aged 70. His firm built a number of office buildings, hotels, etc., for the C.P.R., the sheds for the Montreal Harbor Board, this latter involving the expenditure of about $5,000,000, and the Fort Garry station, Winnipeg, for the Canadian Northern Ry.

J. M. MAVER, who has been appointed Contracting Agent, Northern Pacific Ry., Montreal, was born in Toronto, Aug. 9, 1884. His railway service includes eight years with G.T.R. in freight claims, division freight and General Freight Agent's offices in Montreal, and two years soliciting freight agent, Canadian Interlake Line, Montreal.

BARON FURNESS, better known as Sir Christopher Furness, who died in London, Eng., Nov. 11, was head of Furness, Withy and Co., owners of the Furness line of steamships trading to Maritime province ports, and managers of the Manchester Liners, trading to Montreal, and was honorary President of the Richelieu and Ontario Navigation Co.

WALTER LINDLEY, who died at Hove, Eng., Oct. 22, aged 79, was intimately connected with Canada for many years as Secretary of the old Great Western Ry., and as predecessor of H. H. Norman in the Secretaryship of the G.T.R. Co. in London. Afterwards he was for many years on the directorate of the English Association of American Bond and Shareholders.

W. CORBETT, Travelling Passenger Agent, C.P.R., was on the special troop train which had a head on collision with the Toronto-Detroit express at Streetsville Jct., Ont., Oct. 28. He was on the platform between the baggage car and the first passenger car in which so many casualties occurred, and was thrown against the baggage car and pinned down, but was rescued with very slight injuries.

J. P. DALY, General Freight and Passenger Agent, Ottawa and New York Ry.

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Frank W. Cooper, A.M. Can. Soc. C.E., Division Engineer, Eastern Division, Canadian Pacific Railway.

and New York and Ottawa Ry., was presented with a silver salver by the office staff, a gold signet ring by the station agents, and gold ring, locket and chain by the locomotive engineers and trainmen on the company's lines, Nov. 1, on the occasion of his transfer to Buffalo, N.Y., to another position in the New York Central and Hudson River Rd. Co.'s service.

D. M. McINTYRE, K.C., for the past 15 years city solicitor of Kingston, Ont., who has been appointed Chairman Ontario Railway and Municipal Board, was born at Kingston about 55 years ago. He was at one time an alderman of that city and mayor in 1892 and 1893. He was Vice President of the Ontario Municipal Association in 1905-6. He was an unsuccessful candidate on two occasions for the House of Commons and also on two occasions for the Ontario Legislature.

W. E. BELCHER, C.P.R. travelling grain inspector, Winnipeg, was found dead in bed in an hotel at Weyburn, Sask., which town he was visiting on business, Nov. 8. He went west as agent for the C.P.R. at Portage la Prairie in 1880, but returned to Toronto in 1889, as freight agent for the Northern Pacific Ry., and was afterwards in that company's service in Detroit. He was father of F. P. Belcher, vessel agent, Winnipeg, and formerly connected with the Northern Navigation Co.

G. R. B. WATT, who has been appointed chief clerk, General Advertising Agent's office, Canadian Pacific Ry., Montreal, was at one time in the Highland Ry. Co.'s service at Nairn and Inverness, Scotland. He came to Canada in 1901, since when he has been consecutively, 1901 to 1905, billing clerk, freight office, C.P.R., Ottawa; 1905 to 1907, in city passenger office, Ottawa; 1907 to November, 1912, in General Advertising Agent's office, Montreal, in charge of compilation of public time tables. Entire service with C.P.R.

EDWARD MOHUN, M. Can. Soc. C.E., who died in Victoria, B.C., Oct. 23, aged 74, had resided in British Columbia since 1863. Among other works on which he was engaged were the surveys for the Wellington and Departure Bay Ry. on Vancouver island; divisional engineer on surveys for the Dominion Government projected railway routes through the Eagle and Yellowhead passes in 1871-72. From 1873 he has been principally engaged in private practise, and in 1898 entered the Provincial Government service.

J. E. PINAULT, who has been appointed Superintendent Canada and Gulf Terminal Ry., St. Flavie, Que., was born at Rimouski, Que., June 24, 1884, and was educated at Rimouski College, St. Joseph, N.B., and Chatham, Ont. He entered transportation service Dec. 1, 1900, since when he has been consecutively, Dec. 1, 1900, to Jan. 21, 1902, in track department, Intercolonial Ry.; Jan. 22, 1902, to Sept. 26, 1904, in mechanical department I.R.C.; Sept. 27, 1904, to Oct. 9, 1912, in operating department, I.R.C.; Oct. 10, 1912, appointed Superintendent Canada and Gulf Terminal Ry.

E. PENNINGTON, President, Minneapolis, St. Paul and Sault Ste. Marie Ry., is stated to be the heir to the title and estates of Baron Muncaster. There is an Irish barony created in 1783 and a United Kingdom barony of Muncaster, created in 1898. This latter title will become extinct on the death of the present holder, whose family name is Josselyn Francis Pennington. E. Pennington is reported as stating that he knows all about the matter, that his niece has visited Lord Muncaster, and that there is no doubt that he is the heir.

THE HON. FRANK COCHRANE, Minister of Railways and Canals; Sir Thos. G. Shaughnessy, President, C.P.R.; Sir Wm. Mackenzie, President, Canadian Northern Ry.; Sir Donald Mann, Vice-President, Canadian Northern Ry.; E. J. Chamberlin, President, G.T.R. and G.T.P.R.; D. McNicoll, Vice President, C.P.R., and W. Wainwright, Vice-President, G.T.R. and G.T.P.R., have been appointed honorary colonels under the provisions of the Dominion Militia Act. They will serve on an advisory transportation committee of the Militia Department.

A. E. ROSEVEAR, who has been appointed Assistant to the Vice President, Grand Trunk Ry. (traffic department), entered G.T.R. service in 1879, since when he has been consecutively: 1880 to 1885, clerk, General Superintendent's office, Montreal; 1885 to 1890, stenographer to General Manager; 1890 to 1892, accountant, G.T.R., West Shore Fast Freight Line, Chicago, Ill., and Detroit, Mich.; 1892 to 1898, accountant Reading Despatch Line, Detroit, Mich.; Oct. 1, 1898, to April, 1908, Freight Claims Agent, Montreal; April, 1908, to Oct., 1912, Assistant General Freight Agent, Montreal. Entire service with G.T.R.

That the Lemieux act, providing for the nomination of a board of conciliation to inquire into disputes between employer and employe is constitutional, and that consequently a board named to look into certain differences between the Montreal St. Ry. and a few of its employes was regularly and legally appointed, is the tenor of a judgment given in Montreal recently by Justice Lafontaine in a case which has been occupying the attention of the Superior Court off and on for the past two years. The appointment of the board was attacked by the company on the ground that the act, in virtue of which the Minister of Labor appointed the board, was unconstitutional.

G. M. WILSON, who has been appointed General Foreman Shops, G.T.R., Toronto, was born in Belfast, Ireland, Oct. 5, 1867. He was employed as a machinist on the construction of the G.T.R. St. Clair tunnel in 1889 and 1890, and was then employed by the Jenks Shipbuilding Co., Port Huron, Mich., for a short time. He entered G.T.R. service Nov. 11, 1890, as machinist at Fort Gratiot, Mich., and has since been expert machinist and machine shop foreman. He laid out and supervised the installation of the entire machinery equipment of the G.T.R.'s main shops at Battle Creek, Mich., and just prior to his present appointment supervised the installation of the power plant at the union station and at the Chateau Laurier, Ottawa.

F. W. COOPER, who has been appointed Division Engineer, Eastern Division, C.P.R., Montreal, was born at London, Ont., Feb. 16, 1880, and was educated at the London Collegiate Institute and the School of Applied Science, McGill University, Montreal. He entered railway service in 1901, since when he has been consecutively, 1901 to 1903, on preliminary location, construction and office work with the Algoma Central and Hudson Bay Ry., Sault Ste. Marie, Ont.; 1903 to 1904, transitman C.P.R., London, Ont.; Jan., 1904, to Oct., 1905, Assistant Resident Engineer C.P.R., Toronto; Oct., 1905, to Feb. 1908, Resident Engineer, C.P.R., London. Ont.; Feb., 1908, to Dec., 1909, Resident Engineer, C.P.R., Toronto, Ont.; Dec., 1909, to Nov., 1911, Resident Engineer, C.P.R., London, Ont.; Nov., 1911, to March, 1912, Resident Engineer, C.P.R., Montreal; March, 1912, to Nov., 1912, Assistant Engineer, Maintenance of Way Department, C.P.R., Montreal.

C. A. DUNHAM, who has been appointed Signal Engineer, Grand Trunk Ry., was born in Hamilton, Ont., Oct. 20, 1866. He was educated in Ontario public schools, at night schools in Chicago, and by correspondence courses in engineering. He entered railway service in 1894, since when he has been consecutively:—1884 to April, 1886, helper, mechanical department, Chicago, Burlington and Quincy Rd., Chicago, Ill.; April, 1886, to 1887, in bridge department, New York, Chicago and St. Louis Rd.; in 1887 for three months with U.S. Rolling Stock Co., Hegewisch, Ill.; Sept., 1887, to Jan., 1890, with Grant Bros., railway contractors; Jan., 1890, to Sept., 1892, locomotive fireman and brakeman, Chicago, Burlington and Quincy Rd.; Sept., 1892, to March, 1896, with Union Switch and Signal Co., and National Switch and Signal Co.; March, 1896, to 1899, Inspector of Signals, Illinois Central Rd.; 1899 to June, 1905, Signal Engineer, Illinois Central Rd.; June, 1905, to Nov., 1912, Signal Engineer, Great Northern Ry.

HENRY IRWIN, B.A., M. Can. Soc. C. E., L.C.E., D.L.S., Q.L.S., who has been appointed Consulting Right of Way and Lease Agent C.P.R., Montreal, was born at Newgrove, county Down, Ireland, Oct. 27, 1847. He was educated at private schools until 1863, at the Royal school, Dungannon from 1863 to 1866, and from 1866 to 1871 at Trinity College, Dublin, where he graduated in arts and in civil engineering, being second in his class and obtaining honors in two divisions. His subsequent career follows:—1872 to 1874, assistant to county engineer of Antrim; 1874 to 1887 with J. Nielle, Q.L.S., Montreal, rising from chairman to principal assistant and manager; 1886, became a Dominion Land Surveyor and Quebec Land Surveyor; 1887 to Feb.1, 1904, Assistant Engineer and Provincial Land Surveyor, Canadian Pacific Ry.; Feb. 1, 1904, to Oct. 31, 1912, Right of Way and Lease Agent. In 1890 he won the Pennsylvania University's prize of $400 for essay on construction and maintenance of macadamized roads in an open competition.

Motor Service, Limited, is being organized, according to press reports, in Montreal, with a capital of $500,000, to make a specialty of handling freight in the city by motor truck. D. McDonald, formerly General Manager, Montreal Tramways Co., and M. J. Kennedy, formerly General Freight Agent, Montreal Tramways Co., are said to be interested in the new company.

Railway Manager Wanted for New Zealand—Applications are invited for the position of General Manager of the New Zealand Government Railways. Salary £3,000 a year; term of appointment five years; passage of appointed candidate and family paid. Candidates must be well versed in operating a railway system in all its branches, particularly in passenger and goods traffic. Further particulars and forms of application may be obtained from the High Commissioner for New Zealand, 13 Victoria street, London, S.W., Eng.

Protection for Car Repairers.—The Board of Railway Commissioners has issued a circular stating that its attention has been called to several accidents which have recently taken place wherein car repairers have met with serious injury while working on repair tracks, and that all railway companies subject to the Board's jurisdiction will at the sittings to be held in Ottawa on Dec. 3 be called upon to speak to the question of providing more efficient protection to car repairers working on repair tracks. The companies are asked to be prepared with suggestions and for a general discussion of the question.

National Transcontinental Ry. Operation.—The portion of the eastern section from Moncton to Edmunston, N.B., which has been completed, not having been applied for by the Grand Trunk Pacific Ry., for operating purposes, the N.T.R. Commission started a service on it Nov. 20. Trains leave Moncton Mondays, Wednesdays and Fridays at 7 a.m., arriving at Edmunston at 7 p.m. The return trips are made on Tuesdays, Thursdays and Saturdays leaving Edmunston at 7 a.m., and arriving at Moncton at 7 p.m. W. B. Cronk, heretofore Superintendent of Transportation at Winnipeg, has been appointed General Superintendent in charge of operation, with office at Ottawa. E. P. Cronk has been appointed Superintendent at Edmunston.

Securing of Trucks to Car Bodies. The Board of Railway Commissioners has issued a circular stating that its officers are of the opinion that the number of persons killed and injured in accidents due to derailments, head on and rear end collisions, would be very much reduced, if the trucks of the cars were so attached to the body that the body could not leave the truck in case of such accidents. The Board asks railway companies to give the matter serious consideration, so that, when it is spoken to at an early sitting, a decision can be arrived at.

It is rumored that the Grand Trunk Ry. is contemplating such an installation on the branch between Galt and Elmira, Ont., for which purpose the tests on the Schomberg and Aurora Ry. prove that the car is well adapted

Premiums for Maintenance of Way.—The Pennsylvania Rd. made its annual award recently of $5,400 in premiums for the maintenance of sections of roadbed in the best condition during the past year. To insure the premiums being awarded upon accurate data, a committee of maintenance of way officers went over the line every month during the year in a car attached to one of the regular high speed trains. This special committee was composed of the Chief Engineer of Maintenance of Way as Chairman, the Engineer of Maintenance of Way, the Assistant to the General Manager, and the superintendents of the Manhattan and Central divisions. The first premium was $1,200, of which $800 went to the supervisor and $400 to the assistant supervisor having the best line and surface between New York and Pittsburgh and Philadelphia and Washington. The other prizes were four premiums of $800 each, $600 for the supervisor and $200 for the assistant, for the best line and surface on a main line superintendent's division between New York and Pittsburgh and Philadelphia and Washington. A special improvement premium of $1,000, $700 to the supervisor and $300 to the assistant, was given for the greatest improvement made in line and surface on the main line between New York and Pittsburgh and Philadelphia and Washington.

The shippers' section of the Saskatoon, Sask., board of trade has decided to appoint a traffic officer.

The Minneapolis, St. Paul & Sault Ste. Marie Ry. is said to have ordered 65,000 tons of steel rails.

The Canadian Northern Telegraph Co. has opened offices at Decker, Grays, and Grosse Isle, Man., and at Macrorie and St. Gregor, Sask.

The C.P.R. freight traffic department moved into its new quarters at the enlarged Windsor street station, Montreal, Nov. 9.

G. Marconi, inventor of wireless telegraphy, has lost an eye as the result of a motor accident, and it is stated that the sight of the other is also threatened.

The new combined land rates for wireless telegraph messages which were decided upon during the national wireless conference in June, are to be put in effect in Canada by the C.P.R. Telegraphs and the G.N.W. Telegraph Co., Dec 1.

Moncton press despatches state that the divisional system of accounting has been adopted on the Intercolonial Ry., and that the officials in charge are:—Truro, N.S., — Hallisey; New Glasgow, N.S., E. B. Hagarty; Campbellton, N.B., F. J. King; Levis, Que., — Belanger.

The total delay by troubles in electrical apparatus last year on the 33 electric locomotives operating in the New York terminal district of the Pennsylvania Rd. amounted to only 13 minutes. The total mileage run of these locomotives was 900,000, including a mileage of 56,000 for a single one of them.

The International Brotherhood of Railway Maintenance of Way Employes has decided to hold its bi annual convention in Winnipeg, in Nov., 1914. The officers for the current year include:—H. Irwin, Portage la Prairie, Man., Vice President; W. H. Noysie, Toronto, and G. Seal, Portage la Prairie, members of the executive committee.

Railway Rolling Stock Notes.

The Dominion Coal Co. has ordered 50 fifteen ton wood hopper cars from the Canadian Car & Foundry Co.

The Quebec Oriental Ry. has ordered a snow plow from the Canadian Car and Foundry Co.

The Grand Trunk Pacific Ry. has ordered 10 second class cars from the Canadian Car and Foundry Co.

The Grand Trunk Pacific Ry. has received 3 consolidation locomotives from the Canadian Locomotive Co.

The Canadian Northern Ry. has ordered 650 box cars, 60,000 capacity, from the Canadian Car and Foundry Co.

The Crossen Car Co., between Oct. 13 and Nov. 13, delivered 60 box cars, 60,000 lbs. capacity, to the Canadian Northern Ry.

The Intercolonial Ry. has ordered the following rolling stock:—100 wooden box cars, 60,000 lbs. capacity, from Nova Scotia Car Works; 1 snow plow from Wendell and McDuffie.

The G.T.R. has received the following additions to rolling stock:—62 refrigerator cars, 456 box cars, from Canadian Car and Foundry Co.; 5 box cars, 153 automobile cars, from Western Steel Car and Foundry Co.

The Kootenay and Alberta Ry. has bought a locomotive and a second hand passenger and baggage car from the C.P.R. This is the only rolling stock it will require, as the coal cars for the traffic from the mines will be furnished by the C.P.R.

The British Columbia Electric Ry. has ordered from the Hart-Otis Car Co. six all steel Otis type cars, similar to those supplied last year, the approximate dimensions over all being:—Length, 28 ft.; height, 8 ft. 4½ ins.; capacity, 750 cu. ft.

The C.P.R., between Oct. 14 and Nov. 14, ordered the following rolling stock—2 colonist cars, 1 second class car, 4 freight refrigerator cars, 14 stock cars, 8 vans and 66 flat cars, to be built at its Angus shops, Montreal; 13 dining cars from the Pullman Co.

The C.P.R., between Oct. 14 and Nov. 14, received the following rolling stock—1 P1 locomotive, 7 W3 locomotives, 2 D4 locomotives, 8 baggage and express cars, 3 first class cars, 2 suburban cars, 44 vans, 39 flat cars, 659 box cars, from its Angus shops, Montreal; 472 box cars, from Canadian Car and Foundry Co.; 28 N3 locomotives from Montreal Locomotive Works; 25 D10 locomotives from American Locomotive Co.; 657 box cars from Standard Steel Car Co.; 930 box cars from Western Steel Car and Foundry Co.

The Canadian Car and Foundry Co. made the following deliveries between Oct. 15 and Nov. 15:—Canadian Northern Ry., 6 first class cars, 67 thirty ton box cars. Canadian Pacific Ry., 312 steel frame 40 ton box cars without woodwork, 725 steel frame 40 ton box cars complete. Grand Trunk Ry., 419 thirty ton steel underframe box cars, 70 thirty ton refrigerator cars. International Ry. of New Brunswick, 20 logging cars. Timiskaming and Northern Ontario Ry., 4 steel underframe cars. Canadian Steel Foundries, 6 core oven cars. Montreal Tramways Co., 3 steel electric car bodies.

The Minneapolis, St. Paul and Sault St. Marie Ry. is said to have ordered 10 mikado freight locomotives from the American Locomotive Co. They will be equipped with superheaters.

The Duluth, South Shore and Atlantic has ordered 400 ore cars from the American Car and Foundry Co.

Stoppage of Grand Trunk Construction in New England

It was officially announced by G.T.R. officials in Montreal, Nov. 10, that work on the extensions of the Central Vermont Ry. into Boston, Mass., and to Providence, R.I., which are being built by the Southern New England Ry., have been temporarily suspended, owing to the unsettled condition of the British money market. The contractors on the line being built from Palmer, Mass., southeasterly to Providence, on which about $1,500,000 has already been spent, ceased work on Nov. 10, and about 2,300 men were thrown out of employment. It was expected to have had this extension completed by the end of 1913, and the extension into Boston completed in the following year.

Press reports from Boston state that negotiations are in progress with the New York, New Haven and Hartford Rd. for such rights as will enable the G.T.R. and Central Vermont Ry. to reach Boston and Providence over that company's lines. Vice President Bryans, of the N.Y., N.H. and H. Rd., is reported as stating that an agreement has been reached for the joint use of the C.V.R. tracks between Windsor and White River Jct., Vt., and that the Boston and Maine Rd., a subsidiary of the N.Y., N.H. and H. Rd., had withdrawn its petition for the building of a line from Claremont to Lebanon, N.H., paralleling the C.V.R. He further stated that no other agreement had been made, although negotiations for a general traffic agreement had been going on all summer. These negotiations, President Mellen is reported as stating, if completed, would give the G.T.R. and its subsidiary, the C.V.R., access to all N.Y., N.H. and H. Rd. points, and the latter line access to the C.V.R. and G.T.R. lines.

An official statement was made by E. J. Chamberlin, President, G.T.R., Nov. 13, to the effect that there is no change in the C.V.R. policy relative to the New England connections. The negotiations as to traffic arrangements have not progressed far enough to determine whether such arrangements can be made as would be satisfactory to all parties interested. Should any arrangements be finally agreed to they will be such as will fully protect the interests of all friends of the G.T.R. in New England. It was subsequently stated that a tentative agreement had been made for such a traffic agreement, and that it was to run for 25 years.

The press reports state also that the agreement provides that the extensions to Providence and Boston are to be stopped and eventually abandoned. The attention of the United States Attorney General has been called to the matter, and it is stated that proceedings may be taken to prevent any such agreement being entered into on the ground that it would be a restraint of trade. The official notifications that such an enquiry would be held were served Nov. 19, and the investigation will take place at Washington.

It was further reported in Boston, Nov. 12, that the stoppage of work was brought about without any consultation with C.V.R. officials, and that as a result the resignation of E. H. Fitzhugh, President, might be expected. Subsequently Mr. Fitzhugh stated that there was no foundation for this statement.

A bill has been filed with the clerk of the Legislature of the State of Massachusetts providing for the purchase by the Commonwealth of the Boston and Maine Rd. lines.

Telephone Train Dispatching on the Grand Trunk Pacific Railway.

We are officially advised that the G.T.P.R. is erecting wires for telephone service on the following divisions:—

	Miles.
Lake Superior Division—	
Fort William to Superior Jct.	200
Prairie Division—	
Winnipeg to Melville	285
Melville to Regina	100
Mountain Division—	
Edmonton to Tete Jaune	310
Prince Rupert to Hazelton	180
Alberta coal branch	65
	1,140

Of the above 555 miles is in operation and the additional 585 miles is expected to be complete and available for service by Jan. 1. The apparatus adopted as standard is the Northern Electric 102B selector set and the swinging type transmitter arm, manufactured by the Northern Electric & Mfg. Co., Montreal.

On the Lake Superior division, Fort William to Graham, Ont., the dispatcher will be located at Graham. Fourteen stations will be equipped to start with, and all trains will be supplied with portable train sets and line poles.

A complete telephone service, operated by ordinary telephone methods and instruments, has been installed on the following branch lines:

	Miles.
Melville-Canora	55
Regina-Boundary	85
Regina-Moose Jaw	40
Young-Prince Albert	75
Oban-Battleford	50
Tofield-Calgary	175
	480

A. B. Smith, Manager of Telegraphs, G.T.P.R., is in charge of the work.

Mechanical Conventions at Atlantic City.—The American Railway Master Mechanics' Association will meet at Atlantic City, N.J., June 11 to 13 next, and the Master Car Builders' Association will meet there June 16 to 18.

SEALED TENDERS addressed to the undersigned and marked on the envelope "Tender for Cape Croker Timber," will be received until noon on Thursday, the 5th day of December next, for four hundred thousand feet of timber comprising Maple, Beech, Elm, Basswood, Ash, and Hemlock, being about 50 per cent. Maple, 20 per cent. Basswood, 12 per cent. Beech, 10 per cent. Elm and 8 per cent. Ash and Hemlock, which the Indians of Cape Croker are to take out during the ensuing winter and deliver on the shore of Lake Huron at convenient points for shipment.

Tenderers should state the prices they will pay for the different kinds of timber per M. feet, B. M., over and above Crown dues, as stated hereunder.

An accepted cheque on any Canadian Chartered Bank for $4000.00, made payable to the order of the undersigned, should accompany each tender, which in the event of failure to carry out the undertaking will be forfeited to the Department.

The highest or any tender will not necessarily be accepted and cheques sent by unsuccessful tenderers will be returned.

Reasonable advances should be made to the Indians as the work progresses, if required, and sworn returns of measurement must be made by an Ontario licensed culler.

Any further information desired can be obtained on application to Mr. A. J. Duncan, Indian Agent, Cape Croker, or to the undersigned.

The Crown dues payable to the Department on this timber are as follows:—
Maple and Elm.....$4.00 per M. ft. B.M.
Beech and Basswood....$3.00 per M. ft., B.M.
Hemlock $1.00 and Ash...$2.00 per M. ft., B.M.

The unauthorized publication of this advertisement will not be paid for.

J. D. McLEAN,
Asst. Deputy and Secretary.
Department of Indian Affairs.
—31451. Ottawa, November 18, 1912.

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NOTICE TO ADVERTISERS.

ADVERTISING RATES furnished on application.

ADVERTISING COPY must reach the publishers by the 10th of the month preceding the date of publication, if proof is required, or by the 15th if proof is not required.

TORONTO, CANADA, DECEMBER, 1912

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Relations of Railway Employes to Public.

George Bury, Vice President and General Manager, Western Lines, C.P.R., has issued the following circular to employes:—

The manager of a baseball club at the height of his career conceived the idea of securing a team made up of players from other clubs who had made the highest individual average in their respective positions. He secured them at great cost. As a playing organization it was a failure, from an absence of team work, each player looking solely to his own average. It takes good team work to produce results on a railway as it does in a ball club. Good team work is necessary if we are to hold our present traffic and attract an increasing volume to the road. We can only do so by efficiency and by satisfying the shipping and travelling public.

If there is one unfortunate habit that men in railway service lapse into, it is that of dismissing responsibility by feeling that it belongs to someone else. We cannot obtain results by minimizing the importance of complaints and dismissing them by simply relegating them to some other branch of the service or placing the responsibility on some junior and letting it end there. Everyone connected with our service is expected to use his best efforts in the harmonious working of the system, and co-operate with those surrounding him, considering himself part of the machinery of our organization and endeavoring to increase its effectiveness every way in his power.

Agents, ticket clerks, conductors, baggagemen, checkers, passenger trainmen, and all others whose duties bring them into close touch with the public, by painstaking and uniform courtesy cannot fail to create a favorable impression. Due to the wonderful growth of our country, a large percentage of the people on our trains are unused to travel, having come from foreign lands to seek home in the west, frequently with small means. Little attentions paid to these people and others will come back in many ways. A kind word and a little extra attention will soon establish a lasting impression.

In most places the company's agent is its sole representative in the town where he is located. The estimate put upon the agent by his fellow citizens is the measure of the company's standing in that district. Agents and those who represent the company in various capacities should strive to be a part of the community in which they live, on good terms with their fellow townsmen and sharing the feelings of those with whom they are doing business, making representations which will enable us to meet the wishes of the public, on whom the company's success depends.

Try not to keep people waiting who have business to transact. Make them feel they are welcome and that their business is your concern.

Every employe has certain responsibilities and a sphere of usefulness, and we should all work with the one end in view of making our service such that we will hold and attract patrons.

Railway Finance, Meetings, Etc.

Alberta Railway and Irrigation Co.—Following are the directors and officers elected for the current year:—President, Sir Thos. G. Shaughnessy; Vice-President, G. Bury; other directors, A. R. Creelman, D. McNicoll, L. G. Ogden; Secretary, H. C. Oswald.

Chicago Great Western Rd.—E. J. Chamberlin, President, G.T.R., is reported as stating that the company has not even thought of acquiring the C.G.W. Rd., which recent press reports stated had been purchased in order that a connection might be made between the G.T.R. at Chicago and the G.T. Pacific Ry.

Dominion Atlantic Ry.—Approximate passenger earnings for October, $48,006.03; freight earnings, $77,774.97; total earnings, $125,781, against $169,600 total earnings for October, 1911.

Edmonton, Dunvegan and British Columbia Ry.—A prospectus was issued by Lloyds Bank, Ltd., in London, Eng., recently, offering at 94½ £700,000, the mortgage debenture stock of the E.D. & B.C. R. Co., the principal and interest being unconditionally guaranteed by the province of Alberta, the stock being part of an issue of $7,000,000 authorized to be made, which represents a bonded indebtedness at the rate of $20,000 a mile.

Grand Trunk Pacific Branch Lines Co.—There has been deposited with the Secretary of State at Ottawa a trust deed made between the G.T.P.B.L. Co., the National Trust Co., and the Province of Alberta securing an issue of 4% sterling bonds guaranteed by the province.

Grand Trunk Ry.—Application is being made to the Dominion Parliament for authority to issue a further amount of £200,000 of G.T. consolidated debenture stock.

Blair & Co., New York, are offering $3,360,000 4½% equipment notes, series B, dated Nov. 1, 1912, due semi-annually beginning May 1, 1913. These notes are issued in part payment for 100 locomotives, 2,000 box cars and 50 tank cars.

Great Northern Ry.—The report for the year ended June 30 shows net earnings of $28,535,271, against $23,657,241 in 1911. There was a balance available for dividends of $21,654,255, equal to 10.31% earned on the capital stock, as compared with 8.34% earned last year.

Pere Marquette Rd.—An appeal is being made against the recent decision of the United States district court authorizing the issue of $3,500,000 of receivers' certificates.

Temiscouata Ry.—The annual meeting of shareholders and registered bondholders was held at Quebec recently. The accounts and General Manager's report for year ended June 30 were submitted. The net earnings showed an increase over the preceding year and operating expenses a decrease. After meeting fixed charges, interest and redemption fund for prior lien bonds, a dividend was declared on the consolidated mortgage income bonds and an appropriation provided for betterments to the property.

Following are the directors and officers for the current year:—President, J. H. Walsh; Vice-President, E. O. Grundy; other directors, A. H. Cook, K.C.; F. Murphy, K.C.; A. Laurie and W. N. Campbell; Secretary and General Manager, G. G. Grundy.

Railway Lands Patented.—Letters patent were issued during September covering railway lands in Manitoba, Saskatchewan, Alberta, British Columbia and Yukon for the following number of acres:

Calgary and Edmonton Ry. Co.	1,121.00
Canadian Northern Ry. Co.	3,129.25
Canadian Pacific Ry. Co., grants	133.20
Qu'Appelle, Long Lake and Saskatchewan Rd. and Steamboat Co.	3,048.91
	7,432.36

Norton Griffiths Dredging Co., Ltd., has been incorporated under the Dominion Companies Act, with $1,250,000 capital, and office at Montreal, to carry out general dredging and contracting work in Canadian rivers and harbors, and to develop waterway systems. The chief work which the company will undertake for the present is in connection with the large development works in Courtenay bay, St. John, N.B.

Grand Trunk Railway's Semi-Annual Meeting.

The semi annual meeting was held in London, Eng., Oct. 24, when the report for the half year ended June 30 was presented as follows:—The following summary shows a comparison of the half year's revenue account with that of the half year ended June 30, 1911:—

1911.		1912.		
£3,561,182	Gross Receipts	£3,834,328	1	9
2,628,205	Working expenses, being at the rate of 72.85%, as compared with 73.81% in 1911	2,793,285	19	0
932,977	Net traffic receipts	1,041,042	2	9
Cr. 22,431	Balance of income from rentals, outside operations, and car mileage	Dr. 33,504	9	5
995,408	Total net revenue	1,007,537	13	4
16,013	Amount received from International Bridge Co	16,012	16	7
6,507	Interest on bonds Central Vermont Ry	6,506	14	3
62,510	Interest on securities of controlled lines and on St. Clair tunnel bonds acquired by issue of G. T. 4% debenture stock	70,775	16	9
51,937	Balance of general interest account	51,232	2	7
£1,092,375	Net revenue receipts	£1,152,065	3	6

Following are the net revenue charges for the half-year, compared with the corresponding period:

1911.		1912.		
£ 77,603	Rents, leased lines	£ 77,603	0	9
539,850	fnterest on debenture stocks and bonds of the company	571,641	16	0
30,481	fnterest on debenture stock and bonds of lines consolidated with the G.T. Co.	9,230	2	10
41,758	Canada Atlantic Ry. deficiency	52,805	7	3
39,686	Detroit, Grand Haven and Milwaukee Ry. deficiency	50,680	7	8
£ 729,378		£761,960	14	6
362,997	Leaving a surplus of	390,104	9	0
£1,092,375		£1,152,065	3	6

Adding the balance of £6,830 18s. 7d. at credit of net revenue account on Dec. 31, 1911, to the above surplus for the past half year, the total amount available for dividend is £396,935 7s. 7d., from which the directors recommend the payment of the following dividends, viz.:—

Half-year on 4% guarantced stock	£239,775	18	1
Half-year on first preference stock	85,420	15	0
Half-year on second preference stock	63,210	0	4
	£388,406	13	5

leaving a balance of £8,528 14s. 2d. to be carried forward to next half year's account.

Following is a comparison of receipts for the half years eneded June 30, 1912 and 1911:—

Description of Receipts	1912	1911	Increase
	£	£	£
Passengers	1,035,756	944,570	91,186
Mails and express	162,249	156,656	5,593
Freight and live stock	2,496,200	2,347,954	148,246
Other receipts	140,123	112,002	28,121
	3,834,328	3,561,182	273,146
Passengers carried	5,530,072	5,170,916	359,156
Average fare per passenger	44·95d.	43·84d.	1·11d.
Tons freight and live stock	9,388,829	9,050,269	338,560
Average rate per ton	63·81d.	62·26d.	1·55d.
Tons carried one mile	1,779,753,535	1,655,756,984	123,996,551
Earnings per train-mile	89·75d.	82·33d.	7·42d.

The average rate per ton per mile on the entire freight business was 0.68 of a cent, compared with 0.69 of a cent in the corresponding half year.

The working expenses, excluding taxes, were £2,748,575, or 71.68% of the gross receipts, compared with £2,580,641, or 72.47%; an increase in amount, but a decrease in the proportion to the gross receipts of 0.79%.

Following is a comparison of revenue expenditure, including taxes, for the half years ended June 30, 1912 and 1911:—

	1912	1911	Increase	Decrease
	£	£	£	£
Maintenance of way and structures	347,450	395,713		48,263
Maintenance of equipment	605,637	600,415	5,222	
Traffic expenses	118,049	114,947	3,102	
Conducting transportation	1,508,289	1,373,042	195,247	
General Expenses	109,149	96,524	12,625	
Taxes	44,711	47,546		2,853
Total	£2,793,285	£2,628,205	£165,080	
Percentage of gross receipts	72·85	73·81		0·96
Expenditure per train-mile	65·38d.	60·76d.	4·62d.	

The train mileage compares with that for the half year ended June 30, 1911, as follows:—

	1912	1911	Increase	Decrease
Passenger	4,395,917	4,233,413	162,504	
Freight	5,601,582	5,870,692		269,110
Mixed trains	255,907	276,901		20,994
Total	10,253,405	10,381,006		127,600

The gross receipts for the half year show an increase of £273,146, or 7.67%; the working expenses, including taxes, an increase of £165,080, or 6.28%; and the train mileage a decrease of 127,600, or 1.23%.

The total charges to capital account for the half year were £998,582 15s. 7d. Of this £216,438 7s. 2d. was for the acquisition of Ottawa Terminal Ry. first mortgage bonds, £94,912 8s. 1d. for the acquisition of Lachine, Jacques Cartier and Maisonneuve Ry. bonds, and £80,970 17s. 1d. for discount and commission on 4% debenture stock and 4% guaranteed stock sold during the half year.

The expenditure on capital account in respect of new works, new rolling stock and land purchased was as follows:—

	£	s.	d.
New works	85,934	4	0
New rolling stock	651	7	5
Land purchased	519,675	11	10
	£606,261	3	3

No additions to rolling stock at the expense of capital were made during the half year. Three engines were sold; 7 Pacific type passenger engines, 5 first class cars, 5 baggage cars, and 1 snowplough were built in the company's shops, and 20 switch engines, 44 first class cars, 23 baggage cars, and 74 steel underframe box cars were purchased on revenue account.

CANADA ATLANTIC RAILWAY.

The following are the results of the half year's working of the Canada Atlantic Ry. compared with corresponding period of 1911:—

1911.		1912.
£205,069	Gross receipts	£222,441
188,098	Working expenses	208,671
16,971	Net traffic receipts	13,770
7,025	Balance of income from rentals, outside operations and car mileage	Dr. 821
£ 23,996	Total net revenue	£ 12,949

The interest charges for the half year were £65,754, against £65,753, so that there was a net revenue deficiency of £52,805, compared with £41,757 in 1911. The number of passengers carried was against 833,704 in 1911, an increase, of and the passenger receipts, including mails and express receipts, were £46,267, against £44,185, an increase of 4.71%. The quantity of freight moved was 876,250 tons, against 833,704 in 1911, an increase, or 5.10%; the receipts from freight traffie were £156,948, against £144,928, an increase of 8.29%.

GRAND TRUNK WESTERN RAILWAY.

Following are the results of the half year's working compared with corresponding period of 1911:—

1911.		1912.
£ 661,759	Gross receipts	£ 661,834
549,482	Working expenses	547,993
112,277	Net traffic receipts	113,841
Dr. 53,263	Balance of income from rentals, outside operations and car mileage	Dr. 50,319
£ 59,014	Total net revenue	£ 63,522

The net revenue charges for the half year were £92,187, so that there was a net revenue deficiency for the half year of £28,665, and deducting therefrom the credit balance at Dec. 31, 1911, of £12,521, there remains a net revenue debit of £16,144 at June 30, which amount is carried forward to the current year. The number of passengers carried was 986,012, against 995,116, a decrease of 0.91%; and the passenger train receipts, including mails and express, were £214,306, against £202,176, an increase of 6%. The quantity of freight moved was 1,823,508 tons, against 1,941,374, a decrease of 6.07%, and the receipts from this traffic were £429,610, against £444,898 in 1911, a decrease of 3.44%.

DETROIT, GRAND HAVEN AND MILWAUKEE RAILWAY.

Following are the results of the half year's working of the Detroit, Grand Haven and Milwaukee Ry., compared with corresponding period of 1911:—

1911.		1912.
£ 205,050	Gross receipts	£ 214,957
189,230	Working expenses	206,723
15,820	Net traffic receipts	8,234
Dr. 18,524	Balance of income from rentals, outside operations, and car mileage	Dr. 21,933
Dr. £2,704	Total net revenue	Dr. £13,699

The net revenue charges for the half year were £36,981, against the same amount in 1911, so that there was a net revenue deficiency of £50,680, as compared with £39,685 for the corresponding period of 1911. The number of passengers carried was 383,248, against 373,757, an increase of 2.54%; and the passenger receipts, including mails and express, were £59,502, against £55,511, an increase of 7.19%. The quantity of freight moved was 1,201,323 tons, against 1,192,105 in 1911, an increase of 0.77%; and the receipts from freight traffic were £134,525, against £129,825 in 1911, an increase of 3.62%.

GRAND TRUNK PACIFIC RAILWAY.

As was expected at the date of the last report, the line has been laid to Tete Jaune Cache, 60 miles west of the summit in the Yellowhead pass, on the western slope of the Rocky mountains, and 1,100 miles west of Winnipeg. It is hoped that grading will be completed to the second crossing of the Fraser river, a further distance of 120 miles, before the end of the year. From Prince Rupert, on the Pacific coast, the line has been laid eastward as far as South Hazel-

ton, 180 miles, and it is expected to complete the line to the Bulkley summit, 275 miles from Prince Rupert, next spring. There is still a deficiency of labor on all work under construction.

RECEIPTS

	1912. £	s.	d.
Freight	2,594,612	19	8
Less—			
Cartage, &c.	57,206	5	1
International bridge tolls	17,333	19	11
St. Clair tunnel tolls	23,872	10	0
	98,412	15	0
	2,496,200	4	8
Passenger	1,043,608	2	6
Less—			
International bridge tolls	1,021	15	4
St. Clair tunnel tolls	6,830	11	0
	7,852	6	4
	1,035,755	16	2
Mail and Express	162,248	17	9
Other revenue from transportation	92,123	9	9
Revenue from operations other than transportation	47,999	13	5
	3,834,328	1	9

EXPENDITURE

	£	s	d.
Maintenance of way and structures, 9·6%	347,450	2	6
Maintenance of equipment, 15·79%	605,637	8	9
Traffic expenses, 3·08%	118,049	4	11
Conducting transportation 40·90%	1,568,289	0	3
General expenses, 2·85%	109,148	17	0
Total operating expenses, 71·68%	2,748,574	13	5
Taxes, 1·17%	44,711	5	7
72·85%	2,793,285	19	0
Cr. Net income from rentals	Cr. 76,647	6	6
	2,716,638	12	6
Dr. Dining car service balance	Cr. 32	3	9
	2,716,606	8	9
Dr. Hire of equipment balance	Dr. 110,183	19	8
	2,826,790	8	5
Balance to net income account	1,007,537	13	4
	3,834,328	1	9

REPORTS OF OFFICIALS.

The Chief Engineer, H. R. Safford, reports that the expenditure for maintenance of the property was $234,822.33 less than for the corresponding period in 1911.

The Superintendent of Motive Power, W. D. Robb, reports expenditure, mileage, etc., as follows:—

Half-year ended	Total Expenditure	Train Milcage	Rate of Expense per Mile		
			Train	Engine	Car
			Cents	Cents	Cents
June, 1912	$5,403,368	$10,253,406	52.70	38.61	3.28
June, 1911	4,894,198	10,132,184	48.30	36.99	3.04

An increase in expenditure of $509,170, or 10.40%, compared with an increase in train mileage of 121,222, or 1.20%.

	Passenger Trains	Freight Trains	Mixed Trains
Average number of cars moved per train	4·8	25·3	6·8
And for corresponding period	4·7	24·6	6·9

During the half year 3 engines were sold, and 3 scrapped, leaving at the end of the half year 2 old light capacity engines set aside to be scrapped. Seven Pacific type passenger engines were constructed at the company's works, Montreal, and 20 switch engines were purchased and put into service during the half year. The actual stock at June 30 was 992 engines, against the official figure of 803.

The comparative cost of repairs per train, engine and car mile is given at the head of the next column.

A. W. Smithers, Chairman of the Board, who presided at the meeting, paid a warm tribute to the late C. M. Hays, and showed how the property had improved under his management. He referred to his visit to Canada during the past summer, to the excellent crop results, and to the want of labor for construction on the G.T.P.R. He

Cost per Mile	Repairs and Renewals of Locomotives		All repairing charges, including shop machinery, tools, marine equipment, &c.	
	1912	1911	1912	1911
	Cents	Cents	Cents	Cents
Train	12·24	11·48	14·08	13·11
Engine	8·97	8·79	10·32	10·04
Car	0·76	0·72	0·88	0·83

The Superintendent Car Department, J. Coleman, reports expenditure, mileage, etc., as follows:

Half-year ended	Total cost of repairs and renewals	Total miles run by cars			Cost per mile	
		Passenger	Freight	Total	Car	Train
					Cents	Cents
June, 1912	$1,542,086	21,615,333	143,083,546	164,698,879	0·936	15·05
June, 1911	1,632,423	20,447,399	140,523,639	160,971,038	1·014	16·11

hoped on Jan. 1 next to commence the weekly publication of earnings on the prairie sections of the G.T.P.R. and on the Lake Superior branch, and he hoped that the earnings would show up in quite a satisfactory manner.

In referring to the changes consequent on Mr. Hays' death, Mr. Smithers said:—I visited Canada in May last to make new arrangements, and was fortunate in inducing Mr. Chamberlin to become his successor. Mr. Chamberlin had been Vice President and General Manager of the G.T. Pacific Ry. since 1908. He has had a life long experience in railway work, especially construction, and is well acquainted with the G.T. system. He recommended the appointment of Mr. Donaldson as his successor as Vice President and General Manager of the G.T. Pacific. Mr. Donaldson has been in charge of the Ottawa division of the G.T.R. for some years, with headquarters at Ottawa, and is now in charge of the G.T. Pacific, with headquarters at Winnipeg. Mr. Kelley is now Mr. Chamberlin's right hand man on the G.T. system as Vice President in charge of transportation, maintenance and construction. He was Chief Engineer of the company until last year, and I have every confidence that Mr. Chamberlin will find in him a valuable assistant. When all these arrangements were being made I received valuable assistance from Vice President Wainwright, who has served the company faithfully for 50 years, and who at my request acted as President in the interim caused by Mr. Hays' death, and I have great pleasure in thus acknowledging to you, and thanking him for his long and faithful service.

The American Railway Association's executive committee has appointed a commission to investigate and punish cases of misuse of freight cars which was provided for in per diem rule 19, adopted at the meeting in New York last May. This commission may impose fines at its discretion, the minimum being $2 for each wrongful diversion; the intent of the rule being, evidently, that the commission shall make examples of persistent misuse by one road of the cars of another.

The Cumberland Ry. and Coal Co. has been ordered by the Board of Railway Commissioners to equip its cars with automatic couplers and air brakes within 18 months.

Canadian Northern Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those for 1911-12, from July 1, 1912:—

	Gross Earnings	Expenses	Net Earnings	Increase
July	$1,829,700	$1,335,100	$494,600	$133,000
Aug.	1,745,800	1,375,000	370,800	56,100
Sept.	1,671,500	1,248,000	423,500	4,100
	$5,247,000	$3,958,100	$1,288,900	$193,200
Incr.	$ 774,100	$ 580,900	$193,200	.....

Approximate earnings for Oct., $2,351,200, against $2,028,900 for Oct., 1911.

The mileage in operation during Sept. was 4,297, against 3,716 in Sept., 1911.

Canadian Pacific Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases or decreases, compared with those for 1911-12, from July 1, 1912:—

	Gross Earnings	Expenses	Net Earnings	Increase
July	$12,052,398.58	$7,604,221.68	$4,448,176.90	$745,148.57
Aug.	12,251,715.87	7,533,790.21	4,717,925.66	642,354.65
Sept.	11,579,733.98	7,329,430.13	4,250,303.85	332,857.05
	$35,883,848.43	22,467,442.02	$13,416,405.41	$1,720,306.27
Inc.	5,751,040.9	4,030,680.63	1,720,359.27	.....

Approximate earnings for Oct., $12,960,000, against $11,113,000 for Oct., 1911.

Grand Trunk Railway Earnings, Etc.

The following figures show the earnings and expenses of the G.T.R., C.A.R., G.T. Western Ry. and D.G.H. & M.R. for Sept., as compared with those for Sept., 1911:—

Grand Trunk Railway.

	1912.	1911.
Earnings	$3,706,800	$3,458,600
Expenses	2,607,600	2,476,200
Net earnings	$1,099,200	$ 982,400

Canada Atlantic Railway.

	1912.	1911.
Earnings	$ 217,900	$ 184,400
Expenses	202,700	156,700
Net earnings	$ 15,200	$ 27,700

Grand Trunk Western Railway.

	1912.	1911.
Earnings	$ 613,000	$ 560,000
Expenses	478,300	431,600
Net earnings	$ 134,700	$ 128,400

Detroit, Grand Haven and Milwaukee Railway.

	1912.	1911.
Earnings	$ 221,600	$ 206,500
Expenses	211,400	149,500
Net earnings	$ 10,200	$ 57,000

Approximate earnings for Oct., $4,901,954, and for week ended Nov. 7, $1,061,984, against $4,468,718 and $956,818 for same periods, 1911.

TRAFFIC RECEIPTS OF THE SYSTEM.

Aggregate from July 1 to October 31:—

	1912	1911	Increase
G.T.R.	$15,133,376	13,793,485	1,339,891
C.A.R.	855,466	757,544	97,922
G.T.W.R.	2,426,762	2,265,116	161,646
D.G.H. & M.R.	853,914	799,003	54,911
Totals	19,269,518	17,615,148	1,654,370

Key Harbor Coal and Ore Shipments. The Canadian Ontario Ry. has started to take in coal at Key Harbor, Georgian bay, which is 220 miles north of Toronto, at the end of a six mile branch from the Toronto-Sudbury line. Only about 10,000 tons will be taken in this season, but it will undoubtedly become a large coal handling point in the near future. At present the coal is taken direct from vessel to cars by means of locomotive cranes, and is being stored adjacent to the main line at Key Jct., six miles from the harbor. With the development of the harbor, no doubt coal storage will be arranged for there. The steamboat Kirby, which arrived Nov. 1, was the first coal carrier to reach the harbor. The ore dock adjoins the coal dock and the Kirby took back to Cleveland a load of Moose mountain iron ore. It is expected that the carrying of coal up and ore down will develop into a large trade and make a most economical operation.

Orders by the Board of Railway Commissioners.

Beginning with June, 1904, Canadian Railway and Marine World has published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed our paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates given of orders, immediately following the numbers, are those on which the orders took place, and not those on which the orders were issued. In many cases orders are not issued for a considerable time after the dates assigned to them.

17786. Sept. 17.—Defining express delivery limits in Halifax, N.S.

17787. Oct. 18.—Authorizing G.T.P. Branch Lines Co. to carry traffic over its Alberta coal branch from Bickerdike, Alta., mileage 0 to 36.6.

17788. Oct. 17.—Ordering Atlantic, Quebec and Western Ry. to build crossings, culverts and drains where required along its line.

17789. Oct. 18.—Approving Niagara, St. Catharines and Toronto Ry. location in St. Catharines, Ont., from Welland avenue, just south of G.T.R., to Welland canal crossing, mileage 0 to 0.75.

17790. Oct. 18.—Authorizing C.N. Ontario Ry. to build across Bartlett, Osler, Dufferin, Hamburg and St. Clair avenues, overhead, and Geary and Salem avenues, Toronto, by overhead structure and diversion.

17791. Oct. 18.—Authorizing G. T. P. Branch Lines Co. to build spur for Monarch Lumber Co., Regina, Sask.

17792. Oct. 19.—Amending order 17738, Oct. 8, by substituting Davidson for Davies.

17793. Oct. 18.—Authorizing Campbellford, Lake Ontario and Western Ry. (C. P.R.) to build across road allowance at mileage 41.45, Camden tp., Ont.

17794, 17795. Oct. 18.—Authorizing C.N. Ontario Ry. to build overhead across Weston road, Toronto, and across Montgomery road, Etobicoke tp., Ont.

17796. Oct. 18.—Approving Campbellford, Lake Ontario and Western Ry. (C. P.R.) plan of undercrossing at mileage 169.48, Pickering tp., Ont.

17797. Oct. 17.—Approving Vancouver, Victoria and Eastern Ry. (G.N.R.) plan showing additional land required for accommodation of slopes and bridges over Sumas river, B.C.

17798. Oct. 19.—Approving C.N. Ontario Ry. location through unsurveyed territory in Thunder Bay district, mileage 398 to 413 from Sudbury Jct.

17799. Oct. 19.—Approving G.T. Pacific Ry. station and site at Tete Jaune Cache, B.C.

17800. Oct. 17.—Approving James Bay and Eastern Ry. location of station grounds at Pointe Bleue, Que.

17801. Oct. 18.—Authorizing Niagara, St. Catharines and Toronto Ry. to cross G.T.R. on Welland avenue, St. Catharines, Ont.

17802. Oct. 12.—Authorizing Canadian Northern Ry. to build bridge across Atikokan river at mileage 139.9.

17803. Oct. 18.—Approving C.N. Ontario Ry. revised location through Nelson tp., up east side of Flamboro tp., mileage 31.54 to 37.50 from Toronto.

17804. Oct. 19.—Authorizing C.P.R. to build spur for Robertson Gravel Co., Waxford tp., Que.

17805. Oct. 16.—Authorizing C.P.R. to move station on lot 2, con. 5, to lot 2, con. 3, at Ingersoll Jct., Ont.

17806. Oct. 18.—Ordering G.T.R. to build farm crossing for J. E. Rosger, lot 7, con. 10, Ellice tp., Ont.

17807. Oct. 11.—Authorizing Canadian Northern Ry. to build bridge across Kashabowie river, on main line east, mileage 80.7.

17808. Oct. 19.—Ordering C.P.R. to fence its right of way at Duck Cove, N.B., on south side of D. R. Jack's west line to 100 feet east of Mrs. De Soyres' gate.

17809. Oct. 19.—Authorizing C.P.R. to build extension to Guelph Stove Works siding, Guelph, Ont.

17810. Oct. 21.—Approving Canadian Northern Ry. location through Estevan, Sask., mileage 8.02 to 8.98.

17811. Oct. 21.—Authorizing C.N. Ontario Ry. to build across concession road between cons. 10 and 11, Chisholm tp., station 47.53.

17812. Oct. 22.—Authorizing C.P.R. to operate trains, without their first being brought to a stop, over westbound second track where same crosses C.N.R., Birds Hill branch, mileage 119.18, near Woods, Man.

17813. Oct. 19.—Approving White Pass and Yukon Route, joint passenger tariff of tolls, supplement 1 to C.R.C. 6.

17814. Oct. 21.—Ordering C.N. Ontario Ry. to build farm crossing for G. Boyce, Nepean tp., Ont.

17815. Oct. 22.—Appointing Commissioner McLean to examine, under oath, any witness resident or at present in Canada, produced to give evidence material to complaint of Blind River Board of Trade and London Rolling Mill Co., alleging that G.T.R. and C.P.R. unjustly discriminate against Blind River, Ont., on shipments of bar iron.

17816. Oct. 21.—Authorizing C.N. Ontario Ry. to build across six highways in Chisholm tp.

17817. Oct. 22.—Authorizing, temporarily, G.T.P. Branch Lines Co. to carry traffic over its Oban-Battleford branch, mileage 0 to 48.5.

17818. Oct. 21.—Authorizing C.P.R. to take, for construction of team yard, certain lands in civic Delorimier ward, Montreal.

17819. Oct. 22.—Authorizing C.P.R. to cross at grade Pelham avenue, West Toronto, Ont.

17820. Oct. 22.—Approving Canadian Northern Ry. location through tps. 35-38, rgs. 8-14, w. 2 m., Sask., mileage 93.85 to 135.52.

17821. Oct. 21.—Approving location Vancouver, Victoria and Eastern Ry. double track between mileposts 146.841 and 153.619.

17822. Oct. 21.—Authorizing C.P.R. to take, for constructing team delivery yard, lands fronting on Mance street and Esplanade avenue, in Laurier ward, Montreal.

17823. Oct. 22.—Authorizing Campbellford, Lake Ontario and Western Ry. (C. P.R.) to build across six highways, mileage 161.13 to 164.42.

17824. Oct. 21.—Approving C.N. Ontario Ry. location through Hochelaga county, Que., mileage 55.23 to 59.42.

17825. Oct. 22.—Authorizing C.P.R. to build spur for Paquette and Gauthier at St. Martin Jct., Que.

17826. Oct. 23.—Suspending, until Feb. 4, 1913, tariffs of C.P.R., G.T.R., C.N. Quebec and Temiscouata railways, increasing rate on shipments of pulpwood.

17827. Oct. 24.—Authorizing G.T. Pacific Ry. to build branch from mileage 788.21 from Winnipeg, to Humberstone coal mine; and rescinding order 16654, May 29.

17828, 17829. Oct. 22.—Authorizing G.T.R. to build sidings at Ridgeway, and for MacDonald Thresher Co., Stratford, Ont.

17830. Oct. 22.—Authorizing G.T. Pacific Branch Lines Co. to build its Biggar-Calgary branch across highway between sec. 23, tp. 31, r. 1, w. 4 m., mileage 104.06, Saskatoon district, Sask.

17831. Oct. 23.—Authorizing G.T. Pacific Ry. to carry freight traffic on its Tofield-Calgary branch between Trochu, mileage 121.4, and Beiseker, mileage 162.6.

17832. Oct. 23.—Authorizing C.P.R. to open for traffic its second track from mileage 42.46, at Highlands, to mileage 43.91, at south switch, Que.

17833. Oct. 23.—Authorizing C.P.R. to build spur for Canadian Fairbanks-Morse Co., Winnipeg.

17834. Oct. 23.—Approving location C. N. Ontario Ry. station grounds at Callander.

17835. Oct. 23.—Authorizing C. N. Ontario Ry. to build across public road between cons A and B, Westmeath tp.

17836-17837. Oct. 23, 22.—Authorizing G. T. R. to build sidings and spurs for Shortreed Lumber Co., Kearney, Ont., and Canadian Rumley Co., Toronto.

17838. Oct. 23.—Authorizing G. T. Pacific Branch Lines Co. to build its Prince Albert branch across highway between secs. 6 and 7, tp. 46, r. 26, w. 2 m., mileage 91.8, Saskatoon district, Sask.

17839. Oct. 23.—Authorizing G.T. Pacific Branch Lines Co. to build its Calgary-Boundary branch over Diamond Coal Co.'s spur in n.e. ¼ sec. 21, tp. 9, r. 22, w. 4 m., overhead.

17840. Oct. 14.—Authorizing city of Vancouver, B.C., to build Hastings, Pender, Keefer and Harris streets across Vancouver, Victoria and Eastern Ry. overhead.

17841. Oct. 1.—Approving revised location C. N. Ontario Ry. through unsurveyed territory, Algoma district, mileage 280.5 to 290.6.

17842. Oct. 23.—Relieving C.P.R. from providing further protection at Main street crossing, Chesterville, Ont.

17843. Oct. 24—Authorizing C.P.R. to build across 12 highways in Manitoba and Saskatchewan, mileage 31.27 to 65.3.

17844. Oct. 24.—Authorizing Campbellford, Lake Ontario and Western Ry. (C. P. R.) to build bridge across highway at mileage 95.25, Brighton tp., Ont.

17845. Oct. 24.—Authorizing Campbellford, Lake Ontario and Western Ry. (C. P. R.) to build bridge across road between lots 28 and 29, con. 2, Whitby tp., Ont., mileage 164.42.

17846. Oct. 23.—Approving plan of structural work of Canadian Northern Ry. bridge over C.P.R. secondary canal B, in sec. 9, tp. 25, r. 26, w. 4 m., Alberta.

17847. Oct. 24.—Extending, until July 1, 1913, time within which C.P.R. may operate its Manitou Lake branch from its Pheasant Hills branch, in sec. 6, tp. 40, r. 1, w. 3. m., to sec. 32, tp. 43, r. 21, w. 3 m., mileage 0 to 27.3, between Wilkie and Cutknife, Sask.

17848. Oct. 23.—Requiring Esquimalt and Nanaimo Ry. to appoint permanent agent at Cowichan, B.C.

17849. Oct. 24.—Authorizing C.P.R. to construct third track, south of its present tracks, across Jacques-Cartier Union Ry. Co., on lot cadastral no. 908, Lachine parish, Que.

17850. Oct. 24.—Authorizing G. T. P. Branch Lines Co., temporarily, to carry traffic over its Biggar-Calgary branch from Biggar to no. 1 siding, 7.1 miles.

17851. Oct. 24.—Authorizing C.P.R. to build spur for John Irwin Co., Calgary, Alta.

17852. Oct. 25.—Authorizing C.P.R. to carry freight, temporarily, on its Lacombe easterly branch, from Coronation to Consort, Alta., 32 miles.

17853. Oct. 24.—Authorizing C.P.R. to build spur for Canadian Milk Products, near Belmont station, Ont.

17854. Oct. 25.—Authorizing C.P.R. to cross, for construction purposes only, G. T. R., Toronto Ry. tracks, and John street, Toronto, crossings when in operation to be protected by watchmen.

17855. Oct. 25.—Authorizing C.P.R. to build subway at east end of Coquitlam yard, B.C.

17856. Oct. 25.—Authorizing Campbellford, Lake Ontario and Western Ry. (C. P. R.) to build bridge over road in Camden tp., Ont.

17857. Oct. 25.—Authorizing G.T.R. to build siding for J. Johnson in Vespra tp., Ont.

17858. Oct. 24.—Authorizing G. T. P. Branch Lines Co. to operate trains, without being brought to a stop, over C.P.R. Pheasant Hills branch, in n.e. ¼ sec. 36, tp. 36, r. 16, w. 3 m., Saskatoon district, Sask.

17859. Oct. 22.—Approving location C. N. Ontario Ry. station grounds at Twin Elm, Nepean tp., Ont.

17860. Oct. 24.—Authorizing town of Pointe aux Trembles, Que., to extend Desnoyers avenue across C. N. Quebec Ry.

17861. Oct. 28.—Directing G. T. Pacific Ry. to build farm crossing for J. McArthur, of Pasqua, Sask.

17862. Oct. 19.—Authorizing C. N. Ontario Ry. to build across Sault au Recollet road, Montreal, overhead.

17863. Oct. 26.—Authorizing C.P.R. to build spur for St. Lawrence Bridge Co., crossing main spur and connecting with G.T.R. spur in Lachine parish, Que.

17864, 17865. Oct. 26.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build bridge across highway at mileage 141.27, Clarke tp., and across Marmora street, Trenton, Ont.

17866. Oct. 19.—Refusing application of residents in and around Tete Jaune Cache, B.C., for order directing G. T. Pacific Ry. to build station between mileposts 49 and 50.

17867. Oct. 30.—Refusing application of residents of Erickson, B.C., for order directing C.P.R. to remove loading platform to another location.

17868. Oct. 30.—Authorizing C. P. R., temporarily, to build spur for Anthes Foundry Co., Winnipeg.

17869. Oct. 24.—Directing C. P. R. to build spur from main line east of Neebing avenue, Fort William, Ont., to 100 feet south of C.N.R., passing under C.N.R. by subway; and directing C.N.R. to raise its railway at least 13 feet, so as to carry it over Neebing avenue, and the proposed branch line; and construct temporary structure across Neebing avenue; and rescinding orders 17281 and 17740, Aug. 13 and Oct. 11.

17870. Oct. 25.—Directing Cumberland Ry. and Coal Co. to equip its cars with automatic couplers and air brakes, within 12 months from date.

Electric Railway Department.

Montreal Tramways Company's Track Construction and Methods of Cost Keeping.

By J. D. Evans, Chief Engineer and Superintendent of Construction.

The city of Montreal is situated on an island about 32 miles long and 10 miles wide, surrounded by the St. Lawrence river on the southerly and easterly side, and the Riviere des Prairies on the northerly and westerly side, and consists for the most part of plateau, except for Mount Royal, which rises to a height of 750 ft. above the river.

The city nearly surrounds the mountain, which, of course, makes some of the streets have steep grades, the maximum being about 11%. The average grade for the longest hill, which is 4,100 ft., is 6.2%, and the average grade for the shortest hill is about 10.6%. Our tracks cover the entire island fairly well, but as the streets for the most part are narrow and so laid that none of them can be classified as arterial streets, we have to contend with some difficult problems in construction, because the car routes are so laid out that it is impossible to divert traffic on most of them during the reconstruction period, which feature alone increases the costs.

The Montreal Tramways Co. controls the following companies:—

Montreal Street Railway	148.01	miles track
Montreal Park & Island Ry.	53.36	" "
Public Service Corporation	6.12	" "
Montreal Terminal Railway	28.42	" "
Total mileage	235.91	" "

Of the above 172.52 miles is laid on city streets or highways, 39.86 miles on private right of way, 55.14 of single track, and 78.62 miles of double track. The total of siding and car barn tracks is 23.53 miles.

Of the track mileage on city streets or highways, viz., 172.52 miles, about four miles of single track and 40 miles double track is laid on paved streets, in other words 84 miles of single track, or 44 miles of city paved streets, have tracks on them.

The subsoil in the streets of Montreal is for the most part blue clay, and for this reason we have decided to construct a concrete slab under our tracks, with ties spaced 2 ft. centres, separated from the slab with 1 in. sand cushion. After the rails have been laid and the track brought to proper surface and alignment the ties are entirely concreted in, this concrete serving as a foundation to the pavement. The pavement is either of scoria block, granite block, or granitoid.

Those who have seen the track allowance on the streets on which the cars run may have gone away with the impression that the construction of the tracks is not of the best, but as the city does all the paving construction the company is not responsible for this item, and when the fact is added to this that foundation under the concrete is in many cases composed of rubbish or a bed of an old creek, composed of quicksand or clay, the holding of the track with modern heavy cars passing over it causes the paving to break up rapidly.

Our rail sections are as follows:—

80 lb. A.S.C.E. tee, made in Sydney, N.S.

87-425 Lorain section girder guard, Dick Kerr, 57A.

87-399 Lorain section tee, H. J. Skelton and Co.

87-399 H. J. Skelton and Co.

96-357 Lorain "Trilby" section.

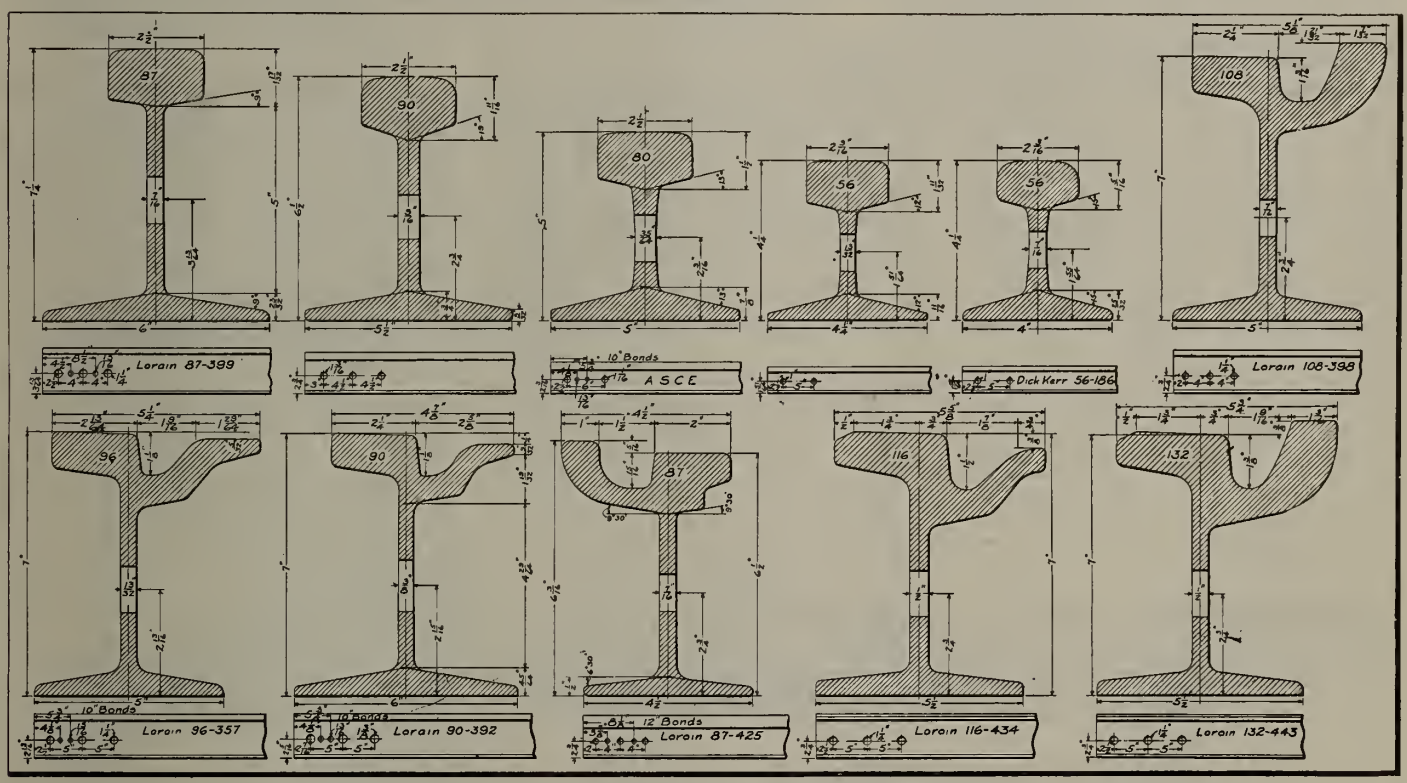
108-398 Lorain girder guard, Dick Kerr, 96C.

116-434 Lorain lip rail, Dick Kerr, section 142.

132-443 Lorain guard rail, Dick Kerr, section 141.

We have within the last year standardized on three rail sections, viz., for suburban work 80 lbs. A.S.C.E. 5 in. T, 87 lbs. T rail, 7¼ ins., where we are permitted by the city franchises to use same on paved streets, and where we are obliged to use girder rail we use 116 lbs.

Where guard rail is used we use the 108 lbs. G.G., which fishes with the 96 lbs. girder rail, and 116 lbs. girder rail which fishes with the 132 lbs. girder guard. Plan 99 I-L-A shows our rail sections used at present.



Rail Sections, Montreal Tramways Co.

The rail plate which we have adopted as our standard is the continuous joint 6 hole, as per plan 121 I-C.

The 116 lb. girder and 132 lb. girder guard rail sections that we adopted this year we are not perfectly satisfied with, because we consider that the back is not bevelled off enough, and we much prefer the 7 in. girder rail sections which have been recommended recently by the American Electric Railway Association's committee of way matters.

As we are great believers in a more flexible foundation for all track construction we have adopted the concrete slab construction which is shown in plan 171 I-B, and have abandoned the concrete stringer con-

struction and the use of steel ties, composed of 4 by 6 in. angles and 10 in. channels, for the following reasons:—

It affords too rigid a construction and causes the rail to become cupped at the joints, and in case of intersections they pound out much more quickly than on a more flexible foundation.

Where concrete stringer and steel ties were used our experience has shown that the rail could not be renewed and still use the steel tie, because the holes in the tie, through which the bolts pass to fasten the rail, become rusted out, or if they do not become rusted any loosening of the tie in the concrete will loosen the grip of the concrete on the head of the bolt, the result being that it is impossible to remove the nut, therefore the bolts have to be cut off and others could not be used without excavating under the tie.

Almost invariably where the rails were placed directly on a concrete stringer with or without steel ties, but with tie rods, this type of construction has proved insufficient to withstand the constant vibration and pounding of cars over it, for in time it causes the cement to disintegrate or crack, thus allowing water to go into these cracks and the action of frost damaging the concrete to such an extent that the rails gradually begin to work their way down into same, in many cases as deep as 1½ ins., particularly so at the joints. In cases where we have used the concrete stringer construction at intersections we in many cases embedded inverted scrap rails so that the special work would rest on them without using any ties, and fastened to the inverted rail with special bolts. This type of construction has proved to give too rigid a foundation, which lessens the life of the special work, and the inverted rails cracked the concrete, with the same result as above.

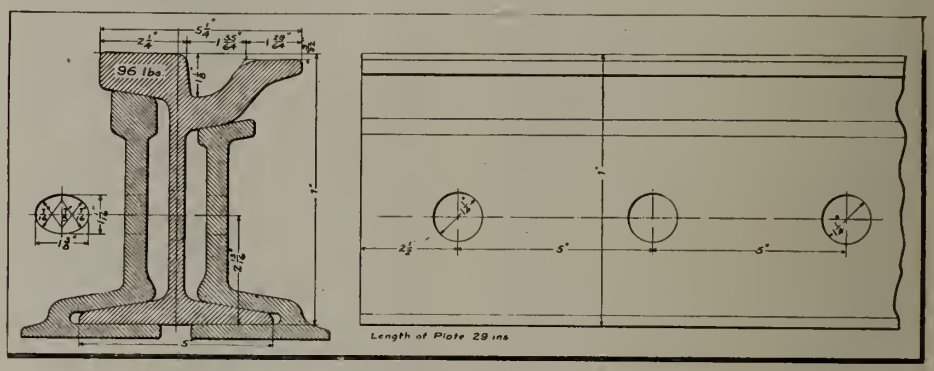
We suppose that our procedure in handling construction work is similar to other large electric railway systems, but nevertheless we will endeavor to outline the methods used by us.

Our engineering and construction departments are under the direct charge of one head, the Chief Engineer and Superintendent of Construction, who reports direct to the General Manager. The engineering department is under the control of the Assistant Chief Engineer, and the construction department under the control of the Assistant Superintendent of Construction, who in turn report to the Chief Engineer and Superintendent of Construction. We find that it is better to have these two departments under one head, inasmuch as the engineering department plans and inspects the work thoroughly carried out by the construction department. You will see from this feature that both departments are dependent one upon the other to such a degree that more perfect harmony and better team work results than would be the case if they were separated and the head of each department reporting direct to the General Manager. We do not know but that some other companies are organized in the same way, and our only idea for mentioning it is because we know of many railways where the engineering and construction departments are two entirely separated departments. The accompanying chart shows the present organization of the engineering and construction departments.

The engineering department decides on what work is to be recommended and gets up the detail estimates (except in emergency repairs, which are handled by the construction department without any estimate as to the work to be done and specifications to be followed) which are approved by the Chief Engineer as per form 100.

This estimate is then summarized on form 193 and sent to the Comptroller, who in turn has a special form 66, which is sent to the General Manager for authorization. After receiving the General Manager's approval the Comptroller then sends on work order authorizing the work on form 251. This comes to the Chief Engineer, who signs same and sends it to the Assistant Superintendent of Construction with any special instructions he cares to issue, which are usually confined to the date when the work is to be started, or any special methods that are to be adopted during construction. As soon as any work has been authorized the engineering department gets out full detail specifications, copies of which are given to the Chief Inspector, who delegates an inspector to look after the particular job, a copy also being sent to the Assistant Superintendent of Construction, who in turn hands it to the roadmaster for the guidance of himself and foreman in charge of the work.

The general instructions that we give to our inspectors we think should be mentioned in this paper. They are as follows:—



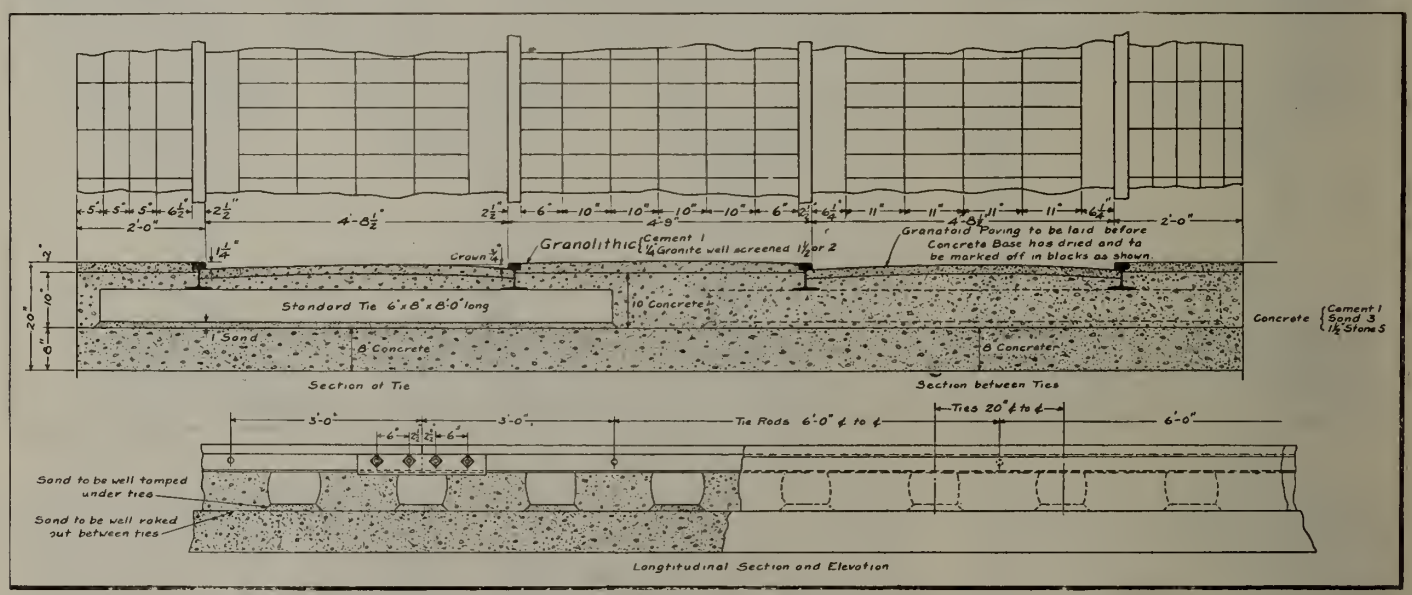
Continuous Joints in 96 lbs. Girder Rails, Montreal Tramways Co.

INSTRUCTIONS TO INSPECTORS.

1. FOREWORD. Careful inspection is a vital factor in securing safe and enduring work. No matter how well the engineer may design, this work will come to naught unless his design is accurately carried out by careful and skillful workmanship, with good materials, and it is the duty of the inspector to see that this is done. However, the inspector should bear in mind that it must be his object to help, and not to hinder, the work in progress.

In the following pages all work will be classified under separate headings, as given on form I-D 337.

2. REMOVING PAVING. Paving must be removed as specified, and care must be taken to see that blocks are piled in such a manner that they will not interfere with any other branch of the work.



Granitoid Paving With 80 lbs. A.S.C.E. Rails, Montreal Tramways Co.

3. EXCAVATING CONCRETE. Concrete is to be excavated under three headings, which are to be specified and classed accordingly:—

(a) Picking:—As a rule, concrete will be excavated by picking, and in the first instance this will be found where, if either of the other classifications are to be followed or not, if the concrete is of medium thickness or is inclined to be soft, picking will be followed.

(b) Hammer breaking should be followed where the picking has loosened up a large block or where the concrete is unsupported by material underneath.

(c) Wedging is to be used where the block of concrete is exceptionally thick and starting of the wedge has been made by picking to be used

for breaking concrete into large blocks, such as can be lifted by the crane or broken by the hammer; also, in cold weather wedging will be found the better way to excavate the concrete.

4. EXCAVATING MACADAM. Care must be taken to see that the points and elevations as given by the company's engineers are followed exactly and report the foreman in charge of work if he allows his men to cart the earth in shovels in any distance beyond which it may be cast by the shovels, but if the distance is too long to be cast by the shovels, wheelbarrows are to be used.

5. REMOVING TRACK. Track to be removed as specified and all old rails, plates, switches, ties and other material to be carefully piled and marked

(a) Blue for all material that is considered can be used again with economy and which would be classed as seconds, and

(b) Red, material which cannot be used again and which is to be classed as scrap. In all cases when possible where tie rods and bolts can be saved it will be necessary to see that the foreman does not allow his men in cutting off the nut to injure the bolt or tie rod; this is done so that tie rods and bolts can be used over again by the application of a new nut and having thread cleaned. All material to be taken away to stores yard and report made of same to office, and receipt to be taken from storekeeper. The different grades of material are to be piled separately in the yard, that is, seconds to be kept separate from scrap, tie rods and bolts to be delivered to the blacksmith's shop to fix up threads and have nuts put on.

6. LAYING TRACK. All track is to be laid on ties 2 ft. centres, standard gauge 4 ft. 8½ ins., and standard devil strip to be 4 ft. 9 ins., unless otherwise specified. Joints must be suspended joints, that is, tie under each end of joint. If a gully or manhole will not permit the proper spacing of ties the stringers must be placed parallel with rail. Specifications as given by the engineering department must be followed absolutely and any deviation from same at once reported. All ties must be well spiked with four spikes, and in the inside of radius of rails of curves to be double spiked. Joints must be well hammered up to place and bolts installed. Care must be taken to see that bolts are not overstrained, and lock nuts must be used on all bolts. Tie rods must be installed on all rails above the 5 in. or 80 lbs. rail, 4 ft. centres and nut both inside and outside of web must be well tightened up and the track placed accurately to gauge.

7. CHANGING INTERSECTION. Inspectors must see that points given by the engineer are followed and special ties laid as shown on plan. No intersection will be laid without special ties except under the order of the engineer. Special heavy National lock nuts will be used on all intersections, and care must be taken to see that all bolts are of sufficient length to have at least the full length of the bolt in the nut. At all ends of intersections the high lip on the G.G. rail, which stands above the level of the head of the rail, must be cut down on an angle to meet the level of the rail; this cut should extend not less than 9 ins. on the angle.

8. CONCRETING. Storage of cement. The requisites for the proper storage of cement are protection from dampness and excessive heat. All cement must be piled on raised platforms or planks or ties and covered with tarpaulins. Supplies of cement as well as other material must be piled as close to the work as possible, though traffic must not be impeded whatever in doing so.

Inspection of sand. Sand composed of round grains makes quite as strong mortar as does sand composed of angular or sharp grains, but if composed of a mixture of fine and coarse grains would be better, but between a coarse and a fine sand of one size of grain the coarse sand is better to use. All sand must be clean and sharp as possible.

Inspection of stone. Stone should be the size specified and free from dust or loam.

Distribution of stock piles. In slab work stock piles should be so distributed that each pile supplies enough material for a section of slab reaching half way to the next adjacent stock pile, and they should not contain more or less material, otherwise a surplus remains to be cleaned up or a deficiency to be supplied by borrowing from another pile. A little care will ensure the proper distribution and more money is saved by not rehandling surplus or borrowed material. The inspector should confer with the foreman on the quantity of material thus to be piled and advise him.

Proportioning. The duty of the inspector is to make certain that the specified proportions are accurately and uniformly adhered to; the inspector should bear in mind that while splitting hairs is not warranted, slipshod and careless methods are not to be tolerated.

Mixing. See that the mixing operations are conducted according to a regular system, that is, to see that the proper mixture of sand, cement and stone is adhered to, and before any work is done, to see that regular quantities are understood by the foreman in charge of the work. This permits the inspector to check the work and tends to produce uniformity of product and decreases the necessity of constant inspection for and correction of faults in the mixture. Mixing should be carried out as close to the work as possible.

Preparation of foundation. Foundation must be levelled off and compacted and must be thoroughly wetted down before any concrete is placed on it, as a dry foundation draws moisture from the concrete.

Wheeling. It is important that in wheeling concrete across tracks, boards or runways must be laid so that rails are not an obstruction to the passage of the barrows, as the added cost more than counterbalances the time lost in lifting wheelbarrows over obstructions, etc.

Placing. Wet concrete requires very little tamping or spreading, but care must be taken to see that it is well tamped under rails and ties and that the surface is brought up to the required grade and smoothed and evened, that expansion joints are to be left where ordered. Care must be taken not to have longer distance than 60 ft. in length of slab. At close of work at night all work must be brought to a finish at the end of a slab.

Wetting down. In hot weather concrete must be wet down once or twice each day for at least a week after it has been placed, in order to allow the inside concrete proper time to set and stop checking and cracking by uneven setting.

9. BALLAST. Unloading ballast. When ballast is to be spread out over a space of comparatively small area it is preferable to dump the cars using wings to spread ballast, but when material must be spread out to 200 to 300 ft., as in placing final material under ties, it is cheaper to drop car doors by pulling out cottor pin at end of levers and unload by hand the quantity required.

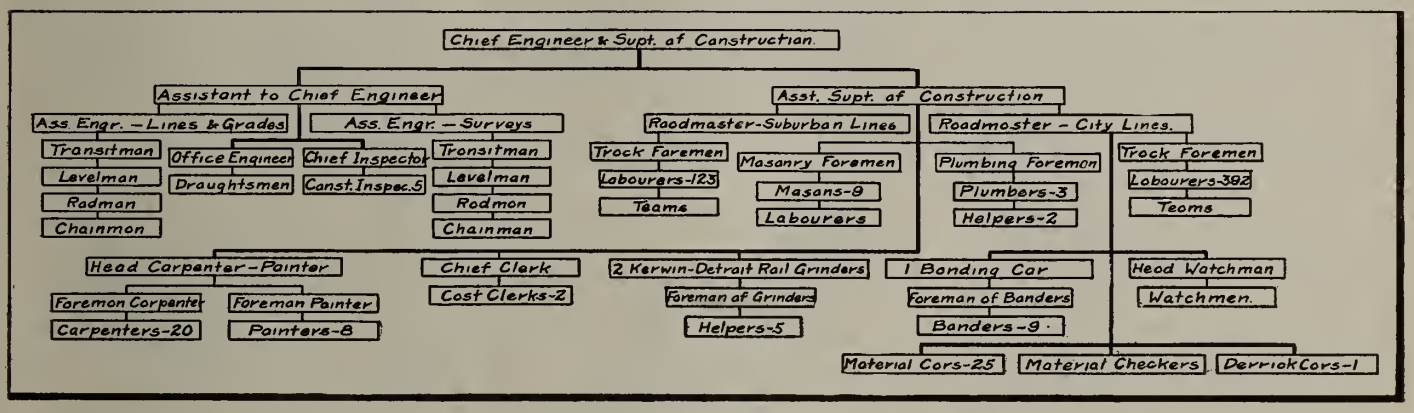
Ballasting. Specifications must be strictly adhered to in regard to depth of fill and size of stone, and all ballast must be well tamped and rammed under the ties, especially under the rail and for one foot each side of the rail.

10. BACKFILLING. Specifications must be followed in this regard, where the backfilling consists of material from street or new macadam, it must be well rolled, and in the case of new macadam good sand must be used for blinding same.

11. PAVING. If old blocks are to be relaid they must be well cleaned and scraped, and after rails have been plastered with a mixture of sand and cement they must be laid as specified; care must be taken that paving is laid as uniformly as possible, and that no hollows or irregularities are left in the surface.

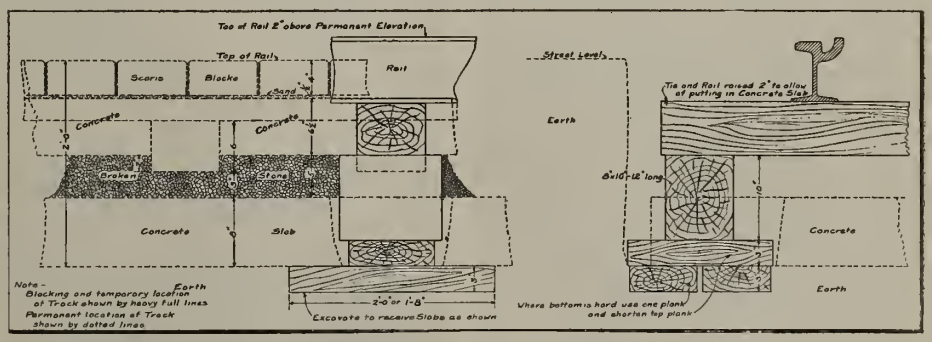
12. REMOVING EXCAVATED MATERIAL. Inspectors must see that excavated material is shovelled direct into cars and not carried in shovels. Dump cars should be used wherever obtainable, and loads on cars be distributed as evenly as possible.

13. BONDING. All bonds to have brazed terminals, and all cable connections down centre of track must be brazed to each rail, 8½ in., 12 in., and brazed cable bonds will be used as specified, and any deviation from this rule must be reported at once.



Organization Chart, Engineering and Construction Departments, Montreal Tramways Co.

After the specifications as to how the work is to be carried on are issued the engineering department gets up the details for all the material required for the job on form 192, which is sent to the Purchasing Agent as well as to the Assistant Superintendent of Construction. The Purchasing Agent sends his copy to the Chief Storekeeper, as his authority for issuing the material shown thereunder, but only upon requisitions from the construction department per form 15. It is the duty of the inspectors to see that the material received on the job is properly checked and reported to the Assistant Superintendent of Construction, also to see that old material is returned to the stores department for proper credit. In case the stores department order form 192 does not show the quantity of material required for the job, on account of some unforeseen change, it is immediately reported to the engineering department, which in turn makes out a supplementary statement and sends to the Purchasing Agent for him to instruct the storekeeper. This is done only after the original authorized estimate has been extended by the proper authorization from the Comptroller,



Blocking for Installing Concrete Slab for Intersection Work, Montreal Tramways Co.

through the General Manager.

As soon as the work begins daily reports are sent to the construction department on form I-D 337, which are signed by the inspector, checker and foreman. This report must sbow the quantity of work done under each classification and the unit cost of same. It also shows the material received and sent away.

The daily reports are posted on form 999 by the cost clerk, whose duty it is to check the daily unit cost for each class of work, and to compute the total unit cost to date as the reports come in, also to enter up the material used on form B-6357.

The Chief Engineer and Superintendent of Construction is given a daily statement showing the comparative cost of labor on form B-5447 for all construction jobs under way. We consider this report very necessary, because the unit costs to date are shown, and if they are running higher than the estimate unit costs an investigation is immediately made and the cause remedied, if possible. Besides the unit cost report we are using a report showing the total cost to date. This report should be used in conjunction with the unit cost report, as it is quite often the case that the unit costs are running under the estimated unit costs, but the quantities are overrunning the estimated quantities, which will make the actual total cost exceed the estimated total cost.

A very good way to reduce the cost of a given job is, where you have a piece of double track to reconstruct, to have one foreman do one side, and after this is completed to change the foreman and gangs for constructing the other side. In one case where we did this the foreman who started the work was removed when it was time to do the other side, and the foreman who came to do the second track under the same specification reduced the total cost 12%. Of course the second foreman knew that he was being judged by the work of the first foreman, and he naturally tried to win out by beating the other man's labor cost. You can readily see that this brings about a healthy condition of affairs which is to the advantage of the company. We do not feel that this would be good practice for the best results in obtaining first class work, unless there is an inspector looking after the quality of the work.

Besides the unit daily reports, form I-D 337, we require the inspectors reporting to the engineering department to make out a daily diary of all work done, forces employed, etc., as well as to describe any accidents or anything unusual which might happen. These reports make interesting reading and help to keep the Chief Engineer and the entire office staff up to date as regards the details of construction, which is very important if one is to superintend by being entirely conversant with all the facts, and not to superintend in name only.

Watchmen's reports are kept on form 132 B.

Weekly record of tools is kept on form 171.

Accidents are reported on form 274.

We are of the opinion that we are getting the right kind of data as to cost keeping by the shortest methods, and one thing we are sure of, and that is, that we know what is going on at all times, which we feel would be impossible if we did not have the present system in force. We make it our aim to have a logical reason for doing everything and we are not afraid to say that we make mistakes, but we try not to make the same mistake in the same way the second time. We consider that by having the general instructions to inspectors carried out that it will continually aid in the reduction of the unit costs.

The unit costs of our work are affected by traffic conditions:—

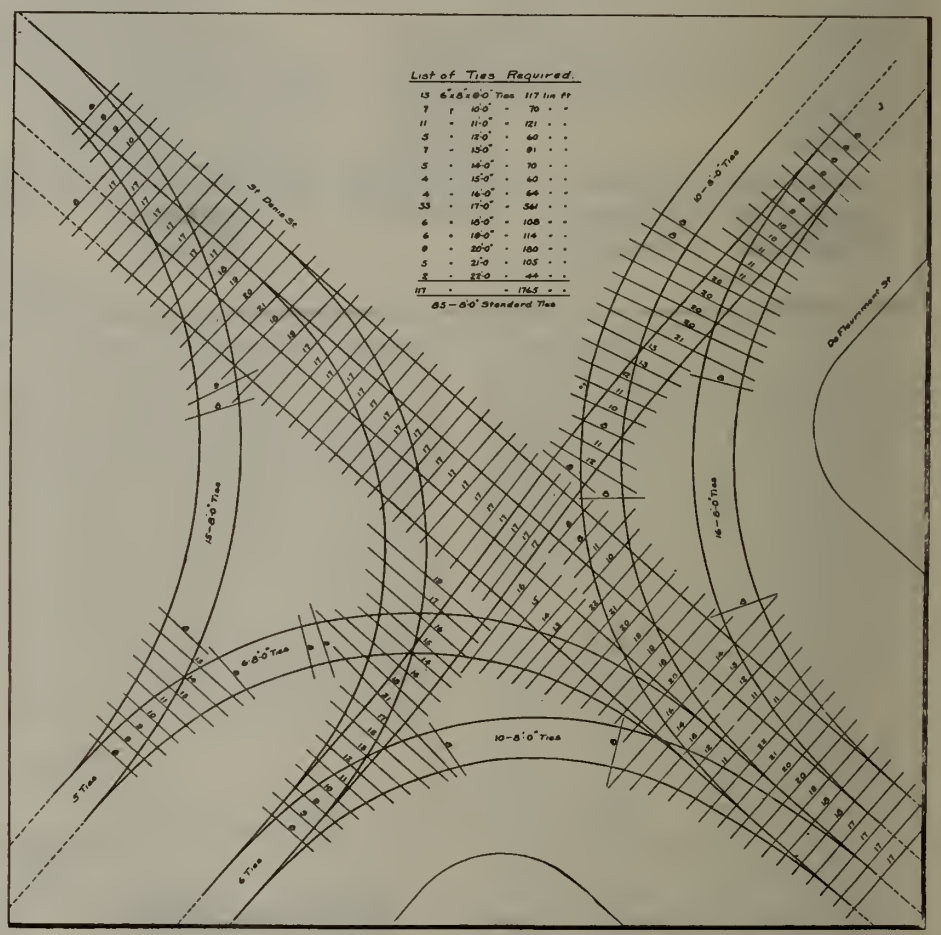
1. Keeping cars running.
2. Keeping streets open for vehicular traffic.

It is very seldom that we can have the full use of any street and the tracks for reconstruction purposes. We will now cite below some of our unit costs.

1. TRACK RENEWALS.

Of seven jobs the unit costs averaged, with traffic running, as follows:—These jobs estimated to cost a total of $88,000.

Taking up paving—17½c. per sq. yd.
Excavation of concrete—$2.02 per cu. yd.
Excavation of macadam—60c. per cu. yd.
Removing track—11c. per lin. ft. This includes entire work of taking up track and transporting material back to store yard.
Tracklaying—18c. per lin. ft. This includes taking material from store yards, and laying track completely, spiked and bolted.
Ballasting—88c. per cu. yd. This includes the delivering of the ballast and the surfacing, lining and tamping of track.



Typical Intersection, Montreal Tramways Co., Showing Layout of Ties.

Concreting—$1.59 per cu. yd. This includes the labor cost of laying the concrete slab as well as the concrete foundation for the pavement.

Paving—Scoria blocks, 39c. per sq. yd. This includes labor, laying and grouting.

Backfilling—46c. per cu. yd. Including tamping or rolling.

Removing excavated material—61c. per cu. yd. This includes labor and transporting material to dump.

The bonding unit costs on the above joba are as follows:—

Stringing cable—2c. per cu. ft. Includes transportation of material from the atores department.

Drilling holes for cross bonding—8½c. per hole.

Installing cable bonds (plug terminals)—16c. per bond.

Installing brazed bonds—14½c. per bond.

Grinding for bonds—8½c. per joint.

2. INTERSECTION RENEWALS.

On six jobs the unit cost ran as follows:—

Taking up paving—13c. per sq. yd.
Concrete excavation—$2.55 per cu. yd.
Macadam excavation—$1.13 per cu. yd.
Removing track—15½c. per ft. Laying track—43½c. per ft. These prices are high because the track laid was only 15 ft. on each end of the intersection, the quantity being small.

Ballasting—$2.09 per cu. yd. This item is high because ballast is only one inch thick under the tie, quantity small as compared to the labor.

Laying concrete slab and concrete for paving base—$1.75 per cu. yd.

Paving, scoria block—37½c. per sq. yd.

Removing excavated material, including transportation to dump—57c. per cu. yd. Unit cost dependent upon haul to dump.

Labor changing intersection averaged $405 per intersection. This item includes taking new and old material to and from the store yard.

BONDING INTERSECTION.

Stringing cable—3-5c. per lin. ft.
Drilling holes—8c. per hole.
Installing cable bonds—11 3-5c. per bond.
Installing brazed bonds—23c. per bond.
Grinding for bonds—17c. per joint.

These two latter costs change depending upon traffic conditions.

Our intersections are mostly constructed of solid manganese steel to the rail sections specified for all switches, mates, frogs, crosses, etc., and for city work we adopted as our standard this year Lorain Steel Co.'s section 116-434 girder rail, and 132-443 G.G. rail, which fishes together, thus doing away with compromise joints. We have given up the idea of having the outer rails of curves guarded, and all curves are made transition to gauge, namely, 4 ft. 8½ ins. We require the manufacturer when accepting an order to agree to the following guarantee:—

The manufacturer agrees to replace:—

(1) Material in which defects develop within one year, at his sole expense.

(2) To replace any part of a given intersection that fails within the second year, at 50% of its value.

(3) To replace any part of a given intersection that fails within the third year, at 66 2-3% of its value.

The most difficult part of our track work to construct and maintain is the intersection work, because we always have to carry on the work by keeping the traffic running, and the headway of the cars is often very close, and when the vehicular traffic is added to this, the wear and tear in the roadbed is found to be enormous. The most essential thing requisite in an intersection is a good foundation, not that the most rigid founda-

tion is the best, as we have explained elsewhere, but it should be placed on a well drained sub-base, with good stiff construction (concrete slab) over it to support the ties, rails and pavement. Various methods of designing the foundations for intersection work have been tried and our experience teaches us that with a more flexible foundation the life of the special work exceeds the life when placed on a rigid foundation, and with this in mind we have adopted the concrete slab 8 ins. thick on a well compacted sub-base with 1 in. sand cushion between it and the ties. The same general type of construction as is used in our straight track work per plan 171 I-B referred to in the beginning of this paper. As cited above we are constructing all intersections with traffic running, the only time cars are stopped is during the actual removal of a given intersection, and the placing of the new intersection which is usually between 8 p.m. and 5 a.m. Some of the smaller intersections are changed in five hours. We bring into use to a great advantage in changing the steel work of the intersections a five ton electric traction crane. When we have an intersection to renew we confer with the Superintendent of Transportation as to the most convenient time for him to give us full use of the particular location in order to divert the traffic by other routes. As soon as the date is arranged when the cars can be diverted, we start removing the paving blocks, and after this work is completed we arrive on the job on the appointed day at 8 p.m. with the electric traction crane and all material loaded on flat cars. As soon as the joints have been disconnected the crane car begins to remove the intersection and place the pieces on the side of the street. After they have all been removed the crane hoist begins to unload the new material and set it as close to final position as is practicable. The new work is painted in colors to correspond to the corners at which it is to be finally placed, as shown by erection plan.

Proposed Electrification of London and Port Stanley Railway.

The London and Port Stanley Ry., which connects London and Port Stanley, Ont., is owned by the city of London and is leased by the Pere Marquette Ry., as successor to the Lake Erie and Detroit River Ry., the lease being about to expire. The following report, based upon instructions by the engineers of the Ontario Hydro Electric Commission and S. B. Storer, consulting engineer, Syracuse, N.Y., has been submitted to the London city council by Hon. Adam Beck, M.P.P. for London and Chairman of the Ontario Hydro Electric Commission:—

The track is in very bad condition, and it will be necessary to entirely reconstruct it, as the rails and ties are of no value other than scrap. The buildings are in fair condition, and, with a moderate outlay for repairs, can be made to answer the purpose of the road after electrification.

The amount expended by the city of London on the road is $765,311.00. Physical statistics, revenue and operation of the present road under steam are as follows:—

Length of line	23.66 miles.
Length of track	33.69 miles.
Freight carried	572,000 tons.
Revenue from freight	$ 92,132.00
Passengers carried in 1910, 168,557.	
Revenue from passengers for 1910..	35,097.00
Total earnings for 1911	141,264.00
Total earning for 1910	127,859.00
Operating expenses for 1910	$138,131.00
Rent, taxes and percentage earnings paid the city	19,919.11
Total operation, including rentals, taxes, etc., but not including fixed charges	$158,050.11

Of the above operating expenses, over $50,000 was for fuel and repairs to locomotives and cars, and $22,000 for pay of conductors, enginemen, brakemen and switchmen.

The London and Lake Erie Ry. and Transportation Co. operates between London and Port Stanley, with a length of main track approximately 15% greater than that of the London and Port Stanley Ry. The equipment in use consists of 12 passenger cars, closed; 10 freight cars, and two work cars. It carried in 1910, 637,861 passengers and 5,811 tons of freight, from which were obtained a revenue of $103,835.50 for passengers, and $12,513.00 for freight, together with miscellaneous earnings, giving gross earnings of $122,988.92. The total operating expenses, including general expenses, rentals, insurance, etc., was $77,699.78. The above expenses do not include fixed charges on capital. The capital is $2,700,000, of which $2,000,000 is stock, and $700,000 bonds. This makes a capital expenditure of $93,103.44 a mile.

The system of electrification will be of the overhead trolley type, using catenary construction, 3 point suspension, with wood poles, steel brackets, and 4|0 copper trolley It is proposed to double track the line from London to St. Thomas, the remaining portion of the line being single track from St. Thomas to Port Stanley, the present road to be entirely reconstructed and replaced by new 80 lb. rails. The proposed overhead trolley system will be operated at 1,200 volts, d.c., with the substations located at London and at or near the Hydro Electric Power Commission's transformer station north of St. Thomas.

The proposed schedule of trains gives a high speed half hourly service between London and St. Thomas, and an hourly service between Port Stanley and St. Thomas, with freight locomotives running at the same time. Every other car is of the combination passenger, baggage and express type, making the run, with all stops between London and Port Stanley, in 54 minutes. A limited passenger car makes the run, without stops, between London and St. Thomas in 24 minutes. A summer schedule is also estimated upon, which gives a half hourly service between London and Port Stanley, with every car carrying a trailer, if necessary. It is also possible, with the equipment which has been provided, to give a 15 minute shuttle service between Port Stanley and St. Thomas, for especially heavy traffic.

The following car equipment has been estimated upon:—Six passenger cars, half of which is the combination passenger and baggage type, with each having four 100 h.p. motors and a multiple unit control for a maximum speed of 50 miles an hour. Four locomotives of 60 to 75 tons, equipped with four 125 to 150 h.p. motors, multiple unit control, and for ordinary speeds of 15 to 25 miles per hour while hauling a 750 ton train. Two snow plows and six trailers.

The above train schedule will handle the traffic under ordinary conditions for both freight and passengers. It comprises a local service combination passenger, baggage and express car leaving London on the hour, and stopping at all stations between London and Port Stanley, the complete run being made in 54 minutes. The trip from Port Stanley to London begins on the hour, and requires the same time for completion, giving a round trip every two hours. A limited passenger car leaves London on the half hour, and makes the run to St. Thomas in 24 minutes, no stops being made between these two cities. The return trip is made in the same time, leaving St. Thomas on the hour. In this way, three passenger cars, two of which also carry baggage and express, would give a half hourly service between London and St. Thomas, and an hourly service between St. Thomas and Port Stanley, which would probably meet the most exacting requirements for ordinary traffic.

As to the type of car, it is believed that one having a weight, loaded, of approximately 40 tons, would give the requisite characteristics for safety and easy riding qualities so much desired in interurban railway service. Such a car would call for an equipment of four 100 h.p. motors (nominal rating), with a full speed (45 to 50 miles an hour) requirement of about 150 e.h.p. The power, while starting or accelerating, would momentarily reach 300 k.w., or 400 h.p., but the duration of the starting load would be so short as to have no effect on the 10 minute peak under which power is purchased. The equipment with four 100 h.p. motors gives sufficient margin to allow for hauling a trailer, if the traffic is heavy enough to warrant it.

A 60 to 75 ton locomotive equipped with four 125 to 150 h.p. motors, would draw a train of from 700 to 800 tons, or from 8 to 10 loaded cars, at 15 to 25 miles an hour, with a power requirement of 175 to 250 k.w., the starting of such a train taking momentarily about 500 k.w. This freight locomotive would make the run from Port Stanley to London in from an hour and a half to an hour and 50 minutes, allowing for stops at such points as would be necessary in permitting passenger cars to go by it.

Ordinary conditions of traffic, represented by three passenger cars and one freight train, would require approximately 600 k.w., on a ten minute peak basis, with momentary peaks of twice that amount. Allowing for transmission and conversion losses, this would amount to approximately 1,000 h.p.

It is estimated that, for handling heavy passenger traffic in summer, each passenger car will be supplied with a trailer, and a half hourly service maintained from London through to Port Stanley; and, in addition to the above, a fifteen minute shuttle service could be maintained between St. Thomas and Port Stanley, at such periods of the day when the traffic warrants it.

With the equipment and service as indicated above, and with a proper charge for the service, it is believed that the passenger earnings alone should amount to over $100,000 a year. According to the records furnished for 1910, the London and Port Stanley Ry. carried a total of 168,577 passengers, with a mileage of 3,183,466, an average travel of 18.89 miles per passenger, with a corresponding average revenue of 20.82c., or practically 1.1c. per passenger mile. October shows a passenger mileage of 100,990, with an earning of $2,071.30, or over 2c. per mile. November shows a passenger mileage of 121,522, with an earning of $1,290.80 or practically 1c. per mile, the mileage being 20% greater, and the revenue 40% less, than the preceding month.

A comparison with the London and Lake Erie Ry. and Transportation Co., which earns $120,000 a year from passengers, mail, express and small freight, seems to indicate that the London and Port Stanley Ry., with its far superior service and schedule, as given below, can easily earn over $100,000 from the same class of service. It is estimated that, with the superior service and schedule proposed, the passengers carried over this road will not be less than 450,000 a year, and that the haul will be about 18 miles. The passenger traffic, at a rate of 1.5c. per mile, will give a revenue of $121,500 a year.

From reliable information received, it is estimated that the freight traffic of the London and Port Stanley Ry. for 1911 was as follows:—572,000 tons of general freight over the Pere Marquette Rd., and not less than 150 to 200,000 tons of general freight carried by the Michigan Central Rd. over this road, or a total freight traffic of from 720,000 to 772,000 tons. About 400,000 tons of coal and steel were handled through Port Stanley, and, in addition to this, 150,000 tons of coal came through St. Thomas to London to Rondeau. The general merchandise was probably in the neighborhood of 200,000 tons, as it was 160,000 tons in 1909. The total tonnage during 1911 appears to have been as much as 750,000 tons, although the detailed reports do not so indicate. The reports show that the gross revenue during 1911, for the 572,000 tons of freight carried, was $92,131.73. This is equivalent to 14.8c. per ton hauled, or a revenue of .9c. per ton mile for all classes of freight, on an average haul of 16.5 miles. It is estimated that an average minimum revenue of at least 40c. per ton will be obtained for first and second class freight, and 16c. per ton for coal and steel. The revenue from coal and steel, estimating on 400,000 tons hauled at 16c., is $64,000, and from 200,000 tons of general merchandise, $80,000, after allowing for car rentals, etc., or a total freight revenue of $144,000. The rate used for general merchandise is very low, and would be found to be higher under operation.

The following estimate covers reconstruction of the present road from London to Port Stanley, using 80 lb. rails, and double tracking from London to St. Thomas, including overhead catenary construction, three point suspension, no. 4|0 trolley, substation and substation equipment, and the necessary feeder system.

Reconstruction of track and new track, and repairs to buildings	$ 442,573
Overhead construction and bonding	129,000
Passenger car and locomotive equipment	235,000
Substation feeder equipment and new freight shed or warehouse for Port Stanley	84,000
Total capital expenditure for new construction and reconstruction track	$ 890,573

The car equipment estimated upon is as follows:—Three combination cars for the accommodation of baggage, express and passenger traffic, together with three cars for passengers alone, each one of these cars being equipped with 4 100 h.p. motors suitable for operation at 1,200 volts d.c. and with multiple unit control, so that two or more cars could be operated as a train if so desired. Four 60 to 75 ton locomotives equipped with 4 125 to 150 h.p. motors with multiple unit control. Six trailer cars for operation with motor cars. Two snow plows. Estimated at a total of $235,000 for equipment. All of the above cars and locomotives are provided with air brake equipments.

The following operating expenses have been estimated:—

Superintendence, administration, labor maintenance of track and equipment	$ 70,000
General expenses	30,000
Power	30,000
Interest and sinking fund, at 6.3% on $890,573	56,106
Interest, at 4½% on moneys expended on present road, $765,311	34,439
Or a total operating expenditure and fixed charge of	$220,545

In maintenance of expenses an allowance is now made for oiling right of way.

SUMMARY OF THE ESTIMATED REVENUES AND OPERATING EXPENSES:

Net revenue from freight	$140,000
Net revenue from passengers	121,500
Total gross revenue	$261,500
Estimated operating expenses	$130,000
Estimated interest and charges on capital expenditure	90,545
	220,545
Excess earnings over operation	$ 40,955

From the above it is estimated that the road, under ordinary traffic conditions, will have excess earnings over operating expenses of $40,955, which can be used for the redemption of bonds and depreciation.

The double tracking of the line from London to St. Thomas will answer the requirements of traffic for some time to come. In any event, should the conditions warrant it, the double tracking between St. Thomas and Port Stanley can be carried out at any time in the future without interfering with the operation of the road.

On the present right of way the grades and curves are small, giving an excellent road for a fast and safe passenger schedule between the cities. The cleanliness which is attendant upon electrical operation of the road will be an inducement to greater passenger traffic, and the more frequent service will add considerably to the business of the road.

I have slight hesitation in saying that with the freight traffic of the present road, and the increased passenger traffic, which I have no doubt will maintain, that the road can be made to pay a good profit after electrification.

The following are comparisons of operating expenses and estimated earnings under the assumed conditions, showing the results of operation:—

1. The estimated operating expenses and earnings when operated by an independent company or commission, this commission or company paying a rental to the city of $20,000 a year. The freight and passenger service, as shown above, have been used in this estimate.

Operation and maintenance of road	$ 130,000
Interest and sinking fund on $765,311.	56,106
Rental to city	20,000
	$206,106
Revenue from operation, as given above	261,500
Or excess earnings over operating expense	$ 55,394

2. This estimate covers the same equipment as used in estimate 1, but the earnings from the haulage of coal and steel have been omitted.

Operation and maintenance of road	$ 130,000
Interest and sinking fund on $890,573.	56,106
Rental to city	20,000
Total operating expenses	$ 206,106
Earnings from passengers and freight other than coal	201,500
Giving an excess operating expenditure over earnings of	$ 4,606

The operating expenses in this case can readily be reduced from $4,000 to $10,000, as the locomotives will not be required for the hauling of coal and steel from Port Stanley.

3. The equipment estimated under this comparison is the same as 1 and 2, with the exception that a single track only is constructed between London and St. Thomas. No earnings are estimated from the hauling of coal from Port Stanley. A single track line from London to St. Thomas would be satisfactory for the passenger service when the freight haulage is reduced to general merchandise between London and St. Thomas.

Operation and maintenance of road	$ 125,000
Interest and sinking fund on $615,000.	38,745
Rental to city	20,000
Total operating expenses	$ 183,745
Earnings from freight and passengers, as per no. 2	201,500
Excess earnings over operating expenses	$ 17,755

The report was discussed at a meeting of the London Board of Trade, Nov. 11, when a committee of citizens was appointed to enquire into the whole matter and obtain further information.

Following up the above action representatives of the Canadian Northern Ry., or Mackenzie, Mann and Co., appeared on the scene and asked for a conference with the L. & P.S. Ry. board, which is composed of representatives of the city of London. On Nov. 25 it was stated that such a conference would be held a few days thereafter, and that propositions to buy the line or to lease it would be submitted.

Hull Electric Railway Employes' Wages, Etc.

The conductors and motormen of the Hull Electric Co., which operates between Ottawa, Ont., and Aylmer, applied to the Minister of Labor a short time ago for a board of conciliation under the Industrial Disputes Investigation Act. The board appointed consisted of Peter McDonald, chairman; G. D. Kelly, representing the company, and G. C. Wright representing the men. The wages heretofore paid conductors and motormen were as follows: 1st year, 19c. an hour, 3rd year, 20c. an hour; 5th year, 21c. an hour.

The men asked that they be paid the same as the Ottawa Electric Ry. employes and submitted the following rates, viz.:—25 cents an hour for week days; 27 cents an hour for Sundays; time exceeding 10 hours, time and a half. The board of conciliation unanimously recommended that the following scale take effect Nov. 1:—First year men, 20 cents an hour; second year men, 21 cents an hour; third year men 22 cents an hour; men employed over three years 23 cents an hour. That motormen and conductors requiring an overcoat shall be supplied with one by the company every two years, the cost to be borne half by the company and half by the employe, this not to interfere with the present arrangement of supplying uniforms. That the company furnish each conductor with $25 worth of tickets and cash to make change each day, each conductor to give a bond therefor. The award to be in force for 2½ years. The board considers that in view of the different conditions of employment and the difference in cost of living the new scale is practically equal to that paid by the Ottawa Electric Ry.

The following important recommendation was also made: "The members of the Board are of the opinion that in view of the proposed increase of wages, and considering the financial condition of the company, as shown by its annual statement, and the evidence given before the board, the company would be justified in increasing its charge for fares."

Proposal for Municipal Electric Railways in Ontario.

At a meeting of the Ontario Municipal Electric Association, in Toronto, Nov. 15, G. R. Geary, city counsel of Toronto, who presided, said it had been called to consider if some plan similar to that by which the lighting and power plants of the province had been developed under the Hydro-Electric Power Commission could be devised with reference to the transportation problem.

Hon. Adam Beck, M.L.A., said the Hydro-Electric Commission would be only too pleased to help along the movement suggested. There were many difficulties in the way, for instance, the government had in the past only leased the right of way for its

transmission lines, in many places. It was intended in future to purchase these outright. There was no reason why electric railways, like other public utilities, should not be successfully operated by the people. He thought, however, that if it were the wish of the meeting that the commissioners should study and report upon the suggestions made for the establishment of lines of light railways for freight and passenger traffic it should only be asked to report upon the cost of construction, operation and probable revenue. The matter of financing should be left over to be dealt with separately.

The following resolution was adopted: "That it is desirable that a system of electric railways, including street railways, to be owned by the municipalities, be established and built, and further, that the Hydro-Electric Power Commission be requested to look into the advisability and practicability of building such a system and to furnish a report thereon to this association. In order that the request to the Commission be made definite, it is further suggested that the initial report should refer only to roads following the hydro high tension transmission lines of the Commission at present existing as contemplated in the Niagara power zone, extending throughout Western Ontario and the midland district. It is desired that the report shall cover cost of construction, cost of operation and probable revenue in each case."

Berlin and Waterloo Street Railway Dispute

The town of Waterloo, Ont., brought a suit recently against the neighboring city of Berlin to enforce accounting under an agreement dated Jan. 18, 1910, respecting the operation of the Berlin and Waterloo St. Ry. Chancellor Boyd gave the following judgment Nov. 8: "The agreement as a whole makes provisions for the operation of the street railway between the municipalities, the railway itself being owned and operated by defendants. Clause 20 provides that Berlin shall pay to Waterloo one quarter of the annual net profits earned by the railway, on Jan. 1 of each year. The complaint is that Berlin has wrongly assumed to make deductions from the total profits, 'under the guise of taxes,' and has so reduced the amount properly payable to plaintiff; and also, with like effect, the defendant has charged to maintenance several sums which should have been properly charged to capital, and otherwise has failed fully to account for other profits. A general accounting is asked, with special declarations of liability. The defendant pleads as a matter of law that the court has no jurisdiction. The objection is well taken, and the action should stand dismissed, with costs. This, of course, without prejudice to any further application being made to the Ontario Railway and Municipal Board."

London Street Railway Adheres to Steam Power.

The London (Ont.), Street Ry. has definitely decided not to use Hydro-Electric power, but to increase its present steam plant, and it has bought a 500 k.w. generator direct connected to an Allis cross compound condensing engine. As direct current turbines of such small capacity are still in somewhat of an experimental stage it was considered best to buy the unit above mentioned. The engine is of such a size that a low pressure turbine could be installed at any time to work satisfactorily with it.

Negotiations for the use of hydro-electric power by the London St. Ry. have been carried on for the past three years. The company installed at considerable expense a graphic recording watt meter showing the exact load conditions. The results obtained by these charts for a whole year were very carefully analyzed and comparisons made as between hydro-electric power and what could be done with steam machinery, the results showing a difference of from $6,000 to $8,000 a year in favor of the steam plant. The London St. Ry. condition is somewhat different from that of the Galt, Preston and Hespeler St. Ry., and the London and Lake Erie Ry. and Transportation Co., which have adopted hydro-electric power, inasmuch as the London St. Ry. would have to suffer the loss in conversion from alternating current to direct current. The other roads mentioned already suffered that loss in their own generation of power, and this may explain why they could use hydro power satisfactorily while the London St. Ry could not.

Order Respecting Winnipeg, Selkirk and Lake Winnipeg Railway.

There has been a long standing dispute between the city of Winnipeg and the Winnipeg, Selkirk and Lake Winnipeg Ry., a subsidiary of the Winnipeg Electric Ry., respecting the use of a portion of Main street north for freight purposes and the alleged blocking of traffic by the electric railway cars. In June the city applied to the Public Utilities Commissioner, H. A. Robson, in connection with the matter, who has recently issued an order disposing of it, the following being the principal points decided. The interurban company (the Winnipeg, Selkirk and Lake Winnipeg Ry.) is to build a double track line along Main street from the south boundary of Kildonan parish, lot 3, to the city's northerly limit, these tracks to be a continuation of the Winnipeg Electric Ry. After a reasonable time for the construction of these tracks has elapsed the interurban company's present single track is to be removed from the west side of Main street, together with all appurtenances, freight accommodation, etc. The Winnipeg Electric Ry. is always to have the use of the line to be built by the interurban company, on terms to be agreed on. The interurban company is authorized to establish a terminal station on lots 1 to 14, in block 1 and lots 1 to 34 in block 2, of Kildonan parish, lot 4, and to build tracks from its line into the station. The interurban company may use the Winnipeg electric railway tracks on Main and Athol streets, etc., for turning cars, and is to be provided with facilities for receiving and discharging passengers there. The double track to be built by the interurban company is to be used by the Winnipeg Electric Ry., and the same facilities for passengers on Main street in the present city limits shall be afforded north of the former city limits as south of it.

Levis County Railway Report, Etc.

The financial statement for the year ended June 30, presented at the annual meeting recently, showed receipts $71,523.86; expenses, $61,424.74; surplus on operation, $10,099.12. The interest on bonds and compound interest on loans, etc., was $12,907.13, leaving a profit and loss debit for the year of $2,808.01. The profit and loss debit at June 30, 1911, was $32,213.11, making the total debit at June 30, 1912, $35,021.12.

The officers and directors for the current year are:—President, S. H. Ewing; Vice President, Hon. R. Turner; other directors, J. A. Richardson, J. Forman, J. C. Blouin, C. E. A. Jones; Secretary-Treasurer, E. A. MacNutt.

Too Late For Classification.

Winnipeg Electric Ry.—Winnipeg press dispatches state that the company has refused the Reese syndicate's offer for the property.

Chatham, Wallaceburg and Lake Erie Ry.—Press reports state that Mackenzie, Mann and Co. interests have obtained an option on this line, which runs from Wallaceburg, Ont., to Erie beach, on Lake Erie, 32.85 miles, with a short branch to Paincourt.

Halifax Electric Tramway Co.—The deal whereby the control of this company passes to E. A. Robert, President, Montreal Tramway Co., and his associates, has been completed, the stock acquired by them having been taken over at 160. The city of Halifax now wants to obtain control, and it is suggested that 170 be offered for the stock, and that if he refused the legislature be asked to authorize expropriation.

London St. Ry.—Gross earnings for Sept., $29,541.07; expenses, $17,656.01; net earnings, $11,885.06; deductions, $2,371.25; net income, $9,513.81; for October, gross earnings, $25,668.78; expenses, $17,890.65; net earnings, $7,778.13; deductions, $2,450; net income, $5,328.13. Aggregate gross earnings for ten months ended Oct. 31, $252,775.14; expenses, $173,831.86; net earnings, $78,943.28; deductions, $24,089.75; net income, $54,853.53.

A Trackless Trolley System, which is said to be the first to be established in Scotland, has recently been placed in operation in Dundee. It is similar in general to other installations which have lately been made in several parts of Great Britain. The cars travel on the highway with a considerable lateral range of motion and obtain their power from overhead wires through two trolley poles, one of them and one wire acting as a return for the current. The cars weigh 3½ tons and accommodate 28 passengers. Two cars are in operation on the Dundee line. The cost of the installation per mile is said to be about one tenth that of an ordinary electric railway system. The principal use of the lines is contemplated to be as feeders to the regular city lines of public conveyance.

The Calgary Municipal Ry. has received three single end, double truck, p.a.y.e. cars from the Preston Car and Coach Co.

The Toronto and York Radial Ry. has received three double end, double truck, p.a.y.e. car bodies from the Preston Car and Coach Co.

The Cape Breton Electric Co. has granted its motormen and conductors the following increases in wages:—First year men from 18c. to 20c. an hour, second year men from 20c. to 21c., third year men from 21c. to 22c., over three years from 22c. to 24c.

The Quebec Ry. Light and Power Co. has granted its motormen and street car conductors an increase of 1½ cents an hour dating from Nov. 1, and an additional 1c. an hour dating from Jan. 1. The question of the recognition of the union and the taking back of discharged employes is being made the subject of an arbitration.

JAMES ANDERSON, General Manager, Sandwich, Windsor & Amherstburg Ry., expects to sail from New York on the s.s. Cedric, Jan. 21, for a trip to the Mediterranean.

The taxpayers of London, Ont., may be asked to vote, Jan. 1, on a bylaw to raise $890,000 for the electrification of the line to Port Stanley.

Electric Railway Projects, Construction, Betterments, Etc.

The Bowness Improvement Co. is making application to the Alberta Legislature for an act of incorporation empowering it among other things to build railways other than steam in the subdivision of Bowness, near Calgary. Jones, Pescod and Adams, Calgary, are solicitors for applicants.

Berlin and Northern Ry.—The ratepayers have defeated the bylaw, approved by the Berlin, Ont., town council, authorizing a contribution towards the building of a bridge at Bloomingdale in connection with the extension of the company's line. (Oct., pg. 520.)

Brandon Municipal Ry.—The city engineer, reporting to the Brandon, Man., city council, Nov. 1, stated that the track work, so far as projected, was practically finished. A good deal of the overhead work has been got in place, and the remainder would be gone on with during the winter. Nothing has been settled as to the power for operating the line, or the ordering of cars. It is stated that the lines will be put in operation May 1, 1913. (Nov., pg. 573.)

British Columbia Electric Ry.—Two additional extensions of the lines in the vicinity of Vancouver have been placed in operation. The first is in the Fairview section, and the second serves A.L. 472, South Vancouver, and the Sixteenth avenue district.

Plans are being prepared, according to press reports, for a line from Clayburn to Mission City. Arrangements have been made for the survey of a line from New Westminster to Port Moody, and G. R. G. Conway, Acting General Manager, informed the New Westminster city council, Oct. 31, that as soon as the reports were received the company would be in a position to give definite consideration to the question of the desirability of its construction.

A draft agreement for a consolidation of the company's franchises, embodying conditions that have been accepted by the company, has been prepared. The mayor claims that Vancouver is not ready for a consolidation of franchises, but he will not oppose the submission of the agreement to a vote of the ratepayers.

The second unit of the new Jordan river power plant on Vancouver island has been put in operation. The company is now supplying 12,000 h.p. to Victoria, and is completing a 6,000 h.p. plant at Tod inlet. The Jordan river plant is to be doubled immediately.

The new line from Willows to the Uplands section of Cadboro bay, Victoria, was expected to be put in operation Nov. 30. A right of way has been secured for a further extension of the line. (Nov., pg. 573.)

The Vancouver city council, Nov. 8, declined to take up for discussion the report of the special committee on the proposed consolidation of the company's franchise in Vancouver.

Calgary Municipal Ry.—The Calgary, Alta., city council is considering recommendations for the expenditure next year of $450,000 upon extensions of the municipally owned electric railway. (Nov., pg. 573.)

Chatham, Wallaceburg and Lake Erie Ry.—Press reports state that the directors have plans under consideration for the extension of the line to Sarnia, Ont., on the north and Blenheim on the south. (Jan., pg. 38.)

Eastern Ontario Electric Ry.—Application is being made to the Ontario Legislature to extend the time within which the company may build the lines authorized by chap. 184 of the statutes of 1909, and to change the provisional directors. (May, 1909, pg. 367.)

Edmonton Interurban Ry.—We are officially advised that the company is building the first section of its projected lines, viz., from Edmonton to St. Albert, Alta., about ten miles. The contractors are pushing the grading ahead as fast as possible so as to have it completed this year. An order for 1,000 tons of steel rails has been placed. In the event of the operation of the line being successful it is expected that arrangements will be made for the building of other branch lines radiating from Edmonton.

It is intended to operate gasoline electric cars on the line, but no orders have yet been placed for cars.

The officers and directors of the company are:—President. G. Barbey, President Franco-Canadian Corporation, Vancouver, B.C.; Vice-President, J. H. Picard, Edmonton; other directors:—M. Kimpe, Edmonton; L. Bureau, Paris, France. (Nov., pg. 573.)

Edmonton Radial Ry.—We are officially advised that the construction of the projected extension of the line to St. Albert, Alta., depends upon a satisfactory arrangement being made between the two corporations. Negotiations are in progress and, if they result satisfactorily, construction will be started in the spring, and the line should be completed and in operation by Jan., 1914. (Nov., pg. 573.)

Farmers Interurban Ry.—Application is being made to the Quebec Legislature for the incorporation of a company with this title to build a railway from Riviere des Prairies to Ste. Anne de Belleville, Que.; and from St. Laurent to St. Jerome, Que., with branch lines; to connect the same with any existing railway, and to operate them by steam, electricity or any other motive power. Loranger, Loranger and Prudhomme, Montreal, are solicitors for applicants.

Halifax Electric Tramway Co.—Press reports state that the new interests in control of the company will spend a considerable sum upon the betterment of the lines. (July, pg. 367.)

Hamilton Radial Ry.—According to press reports the project of building an electric railway round the north shore of the bay from Hamilton to Burlington, Ont., is again under consideration. It is said that the plan involves the utilization of the present line to Burlington as a branch of the Hamilton Street Ry. (June, pg. 308.)

Hamilton Street Ry.—E. P. Coleman, General Manager, is quoted as stating that the company proposed to extend its tracks along Barton street to Kenilworth and on to the Hamilton Radial Ry., near the site of the National Car Co.'s plant. The matter was discussed with the Hamilton city council's committee on street railways, Nov. 1, and it is said that the line will be built as soon as certain legal difficulties are straightened out. (Oct., pg. 520.)

Imperial Traction Co.—Application is being made to the Dominion Parliament for an act to authorize the building of the following additional lines:—From Smithville, in Lincoln county, to Bridgeburg, Welland county, and from Hamilton to Toronto. Harding and Owens, Stratford, Ont., are the solicitors. (June, 1911, pg. 555.)

Kingston, Portsmouth and Cataraqui Electric Ry.—While an understanding has been reached between the company and the Kingston, Ont., city council as to the laying of the new road bed, some further information is to be secured before the necessary bylaws are prepared for submission to the taxpayers. (Nov., pg. 573.)

London and Northwestern Ry. of Canada.—Press reports from London, Ont., state that this company's charter has been acquired from D. A. Stewart by Canadian Northern Ry. interests. The company has power to build a line from London to Sarnia, with a number of branch lines. (Oct., pg. 520.)

Medicine Hat, Alta.—The terms of the proposed agreement with Sir Max Aitken and associates for a street railway franchise in Medicine Hat have been put into writing, and are being given a final consideration. Representatives of a British financial firm are asking for an opportunity to submit an alternative proposition. (Nov., pg. 573.)

Moncton Tramways, Electricity and Gas Co.—Track is reported laid on the Mountain road extension of the line in Moncton, N.B., as far as the bridge, and the overhead work has been completed. It is expected that the extension will be opened for traffic early in December. (Oct., pg. 520.)

Montreal and Southern Counties Ry.—The Minister of Railways has approved of route map for extension of the line through Greenfield Park municipality, 2.25 miles.

The Montreal city council has granted the company permission to extend its lines in the city across McGill street and along Youville square. It has also granted permission to carry farm produce as freight.

W. B. Powell, Vice-President and General Manager, is reported to have recently stated that it was expected to have the company's line to Richelieu in operation by Nov. 30. The greater part of this 17 miles of line is over the right of way of a section of the Central Vermont Ry., which has been taken over, and this C.V.R. branch will be utilized as far as St. Cesaire for the Granby extension. A new right of way, for the greater distance along the old Montreal road, has been secured from St. Cesaire to Granby. The building of this extension will necessitate the erection of a new four span bridge over the Yamaska river near St. Cesaire. (Nov., pg. 573.)

Montreal Tramways Co.—The new line to Westmount boulevard is reported to have been completed. The Outremont town council has accepted the company's proposition to lay a single track line on Bernard and Outremont streets at once, and to lay a second track thereon at some future time. (Nov., pg. 573.)

Moose Jaw Electric Ry.—A. H. Dion, Superintendent, in an interview, Oct. 31, is reported to have said that two extensions have been completed during this year, the company having now 10 miles of track in operation. The extension to the park had to be abandoned for the present owing to inability to get steel and the scarcity of labor, and the completion of two other extensions under construction would also have to be left over until the spring. An addition is being built to the car barn. The foundations for the new section of the power plant have been completed, and the machinery is in course of delivery. The new unit will be a 500 k.w. one. (July, pg. 368.)

Application is being made by the company to the Saskatchewan Legislature for power to extend its lines outside the city of Moose Jaw, subject to agreements being made with the various municipalities, and to increase its capital from $500,000 to $1,000,000.

Niagara, St. Catharines and Toronto Ry.—The Board of Railway Commissioners

from Welland avenue to the Welland canal has approved of location plan of the line crossing in St. Catharines, Ont., 0.75 miles. This is the final section of the extension to Niagara-on-the-Lake. The right of way has been acquired for nearly the whole distance, and it is expected that construction will be started at an early date.

Application is being made to the Dominion Parliament for an act extending the time within which the company may build the lines authorized to be built by paragraphs b, c and d, sec. one, chap. 132 of the statutes of 1906, and by sec. eight, chap. 77 of the statutes of 1899. (Nov., pg. 574.)

We are officially advised that no statement can at present be made regarding the time when construction will be started on the new line from St. Catharines to Niagara-on-the-Lake, right of way matters not having been settled.

Nipissing Central Ry.—The final inspection of the extension of the line from Haileybury to Liskeard, Ont., was made by the Temiskaming and Northern Ontario Ry. Commissioners, Oct. 23, when a special car was run over the line. A regular car service was placed in operation Nov. 1. (Nov., pg. 574.)

Ottawa and St. Lawrence Electric Ry.—Press reports state that surveys are practically completed for the line between Ottawa and Morrisburg, Ont., and that the contractors are preparing to start work next spring. The contract is said to call for the completion of 50 miles by the spring of 1914. (Nov., pg. 574.)

Owen Sound, Ont.—Mayor Lemon is quoted as stating that negotiations are in progress for the construction of an electric railway in the town, and that a definite proposal will be submitted to the council at an early date. (Feb., pg. 91.)

St. John Ry.—Application has been made to the St. John, N.B., city council for authority to lay out turn-ins to the new car shed on Wentworth street.

Tenders are being received to Dec. 2 by the Provincial Government for the construction of a new bridge at the reversible falls. The bridge will have a total length of 730 ft., and will have two sets of tracks for the electric railway. (Nov., pg. 574.)

Saskatoon Municipal Ry.—We are officially advised that the building of this railway is being supervised for the Stone and Webster Engineering Corporation of Boston, Mass., which is financing the work for the city council, by J. B. Townsend, the city commissioners being in charge for the city.

The car barn is of brick, 163 by 94 ft. The foundation walls, column fittings, pits and floors are concrete. There are three intermediate lines of wooden posts, and the wooden roof is covered with tar and gravel. One of the longitudinal bays is given over to office room, employes rooms, shops, etc., while the remainder of car barn is devoted to tracks. There are three pits about 70 ft. long, and a paint shop 23 by 40 ft. The windows all around the walls, skylights and ventilators give plenty of light and air. An efficient heating layout is being installed to insure the inside temperature against the severe winter weather. The power station is to be equipped with two 300 k.w. generator sets, which have been ordered from the Canadian Westinghouse Co.

The city has under consideration the question of the appointment of a manager. (Nov., pg. 574.)

Stratford Ry.—A new bylaw for an electric railway franchise was practically agreed upon at a meeting of the Stratford, Ont., city council, Oct. 31. This bylaw, it is expected, will be finally completed for submission to the taxpayers at the election, Jan. 1, 1913. (Nov., pg. 574.)

Taber, Alta.—Preliminary surveys have been made for an electric railway to connect Taber, Alta., with the various coal mining camps in the vicinity, and it is reported that applications will shortly be made to the town for a franchise, and to the Legislature for a charter incorporating a company to build the line. Calgary men are reported to be interested.

Toronto Civic Car Lines.—The Toronto city council has authorized the purchase of the necessary rolling stock and equipment for the civic car line on Gerrard street east, and to inaugurate a service thereon at the earliest possible moment. This was decided upon after a suggestion by the General Manager of the Toronto Ry. for the operation of the lines had been mentioned. This suggestion came through a special committee which had been authorized to see him. The suggestion was a tentative one, and was to the effect that the city pay the company 20 cents a car mile for the operation of cars over the line, the line to be operated in conjunction with the company's line. (July, pg. 368.)

Toronto Eastern Ry.—The Minister of Railways has approved of route map for the line from Pickering, Ont., westerly for 12 miles. The route originally surveyed ran from Pickering to a junction with the Canadian Northern Ontario Ry., near Cherrywood. The new route runs southwesterly from Pickering, crossing the G.T.R., and going on to the crossing of the Kingston road west of West Hill. (Oct., pg. 521.)

Toronto Suburban Ry.—The right of way for the line is reported to have been secured from Meadowvale to Guelph, Ont., with but few small exceptions. Some grading is reported to have been done on this section. On the Maher subcontract, the grading is practically completed from west of Islington to Summerville, and is now in progress from Islington easterly to Lambton. (Nov., pg. 574.)

Winnipeg Electric Ry.—Work on the double tracking of the Main street line from the southern boundary of parish lot 3, Kildonan, to the present northern limits of Winnipeg is being rushed. At the end of the extension of double track, new terminals for the Winnipeg, Selkirk and Lake Winnipeg Ry. will be laid out on a site recently acquired. The extension on Mountain avenue has been completed. A franchise has been granted the company for the construction of an electric railway in St. Vibal. (Nov., pg. 575.)

Electric Railway Finance, Meetings, Etc.

British Columbia Electric Ry.—Gross earnings for Sept., $559,486; operating expenses, $345,366; net operating earnings, $214,120; renewal funds, $51,620; net earnings, $162,500; approximate income from investments, $35,000; net income, $197,500, against $453,391 gross earnings; $282,443 operating expenses; $170,948 net operating earnings; $37,935 renewal funds; $133,013 net earnings; $25,000 approximate income from investments; $158,013 net income for Sept., 1911. Aggregate gross earnings for three months ended Sept. 30, $1,651,474, net earnings, $579,342, against $1,299,241 aggregate gross earnings; $441,138 net earnings, for same period 1911.

Calgary Municipal Ry.—Revenue for September, $59,956.25 against $34,204.35 for Sept., 1911. Net earnings, $13,056.62 against $7,095.24 in 1911. Passengers carried, 1,433,067 against 818,969.

Cape Breton Electric Co.—Gross earnings for Sept., $34,363.62; operating expenses and taxes, $15,777.26; net earnings, $18,586.36; interest charges, $4,495.84; balance, $14,090.52; sinking and improvement funds, $1,206.66; balance for reserves, etc., $12,883.36, against $30,314.16 gross earnings; $14,976.26 operating expenses and taxes; $15,337.90 net earnings; $4,512.50 interest charges; $10,825.40 balance; $1,140 sinking and improvement funds; $9,685.40 balance for reserves, etc., for Sept., 1911. Construction charges for month, $6,087.39.

Hamilton Street Ry.—It was reported to the Hamilton, Ont., city council, Nov. 1, that the total receipts of the street railway for the three months ended Sept. 30 were $150,144.49, compared with $130,758.93 for the corresponding three months of 1911. The city's rental and percentage were $12,011.58.

Kingston, Portsmouth and Cataraqui Electric Ry.—At a meeting of the Kingston, Ont., city council, Nov. 14, it was decided to ask the company if it was willing to sell its line to the city.

Lethbridge Municipal Ry.—Receipts for Oct., $7,034.24; passengers carried, 159,140.

Port Arthur and Fort William Electric Ry.—Passenger earnings for Sept., $21,411.02; Arthur street line, $910.01; baggage and miscellaneous earnings, $948.45; total earnings, $23,269.48; operating expenses, $12,401.59; net earnings, $10,867.89. Car mileage, 101,515; gross earnings per car mile, 22.921 cents; operating expenses per car mile, 12.216 cents; net earnings per car mile, 10.704 cents.

Quebec Ry., Light, Heat and Power Co.—A recent cable from Paris, France, states that the French Association of Foreign Bondholders has formed a committee of defence for the bondholders of the company resident in France.

Toronto Ry., Toronto and York Radial Ry., Etc.—Gross earnings for Sept., $767,944; operating expenses, maintenance, etc., $404,171; net earnings, $363,773, against $705,961 gross earnings; $309,706 operating expenses, maintenance, etc.; $396,255 net earnings, for Sept., 1911. Aggregate gross earnings for nine months ended Sept. 30, $6,221,043; net earnings, $3,185,100, against $5,559,647 aggregate gross earnings, $2,886,405 net earnings, for same period, 1911.

Winnipeg Electric Ry.—Gross earnings for Sept., $309,722; operating expenses, $162,870; net earnings, $146,852, against $321,664 gross earnings; $146,140 operating expenses; $175,524 net earnings, for Sept., 1911. Aggregate gross earnings for nine months ended Sept. 30, $2,737,552, net earnings, $1,280,748, against $2,825,637 aggregate gross earnings; $7,433,507 net earnings, for same period 1911.

Electric Railway Notes.

The British Columbia Electric Ry. Co. has ordered five 50 ton electric locomotives from the Westinghouse Electric & Manufacturing Co., to be equipped with four 308B-3 motors and H.B. control.

The Sandwich, Windsor and Amherstburg Ry., which is about to increase its power house equipment, has ordered a 1,250 h.p. engine and 800 k.w. railway generator from Allis-Chalmers Co., Milwaukee, Wis., to be delivered in March, 1913.

The Guelph (Ont.) Radial Ry. received recently from the Preston Car & Coach Co. a single truck snow sweeper, double end operation, with 33 in. brooms, an illustration of which appears in this issue. It has standard steel underframe and steel tired wheels. The motor equipment consists of two Westinghouse 101B2 motors with K10

controllers, and one 101B motor with K10 controller to operate the brooms.

The St. John (N.B.) Ry. has received two additional pay-as-you-enter cars.

The Ottawa Electric Ry. is said to be preparing plans for a car house on Cobourg street, to cost about $25,000.

The Kingston, Ont., city council is negotiating for the purchase of the Kingston, Portsmouth and Cataraqui Electric Ry.

The British Columbia Electric Ry. has received ten of the 22 passenger cars recently ordered in the United States.

Four new cars were put in operation on the Hamilton (Ont.) St. Ry., Nov. 13. They are each 21 ft. long, and replace the old 16 ft. cars.

Double End, Single Truck Snow Sweeper, for Guelph Radial Railway.

The Toronto Railway's revenue for October was $480,942 37, against $419,004.75 in 1911. The city's percentage this year was $38,475.39.

A. Sturgeon, a Toronto Ry. motorman, was recently fined $50 and costs or 60 days' imprisonment, by the police magistrate, for driving a car while intoxicated.

The Montreal city council has put in force a new traffic bylaw under which the street railway bylaw 210 will be enforced by the policemen at street intersections.

The Moose Jaw Electric Ry. has in service 12 cars, and there are being built by the Ottawa Car Co., for 1913 delivery, four double truck cars and several single truck cars.

C. L. Case, A.M. Can. Soc. C.E., read a paper on the Sherbrooke Ry. and Power Co.'s hydro electric plant at Sherbrooke, Que., before the Canadian Society of Civil Engineers recently.

The Nipissing Central Ry. was bought about a year ago by the Timiskaming and Northern Ontario Ry. Commission for $250,000. The net earnings from Nov. 1, 1911, to June 30, 1912, were $13,488, or over.

The Halifax city council has been discussing the advisability of offering E. A. Robert, President, Montreal Tramways Co., and his associates $170 a share for the controlling interest in the Halifax Electric Tramway Co., which they bought at $160 a share recently.

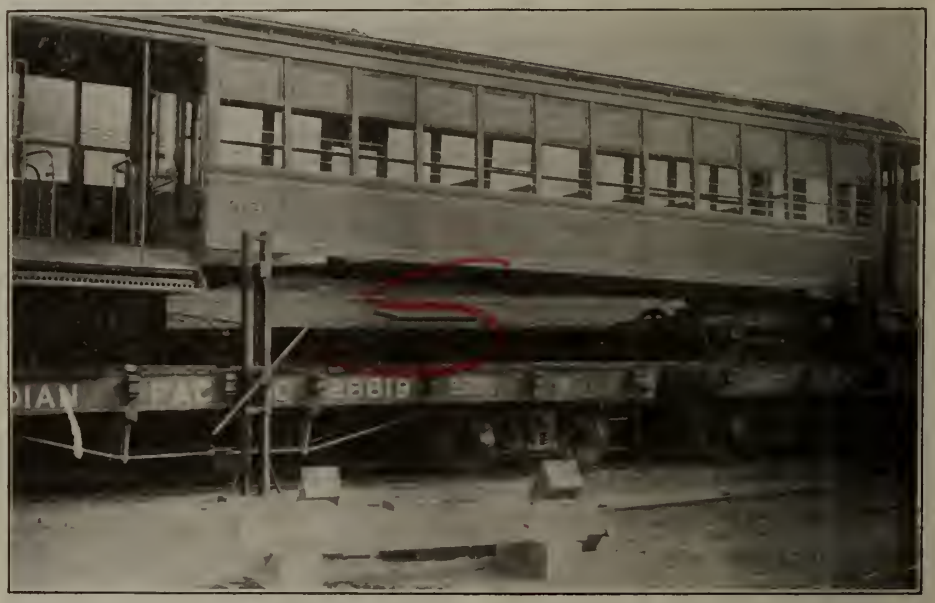
Arrangements are being made to have a vote taken in London, Ont., on the question of permitting the operation of a car service in the city on Sundays. Owing to the recent annexation of additional territory the city now has more than the 50,000 population required.

A club for the British Columbia Electric Ry.'s office staff was opened, Nov. 1, by G. R. G. Conway, Acting General Manager. The space devoted to the club is 80 by 60 ft., and is divided into three rooms, one for social gatherings, one for reading and games, and the other a billiard room.

Loading Electric Cars at Ottawa Car Company's Plant.

This plant is located in the centre of the city of Ottawa, away from the steam railway lines, and in consequence has no siding for the loading of the finished street cars on to flat cars for transhipment to their destination. The Ottawa Car Co. and the Ottawa Electric Ry. Co. are in close touch with each other, and have come to an agreement whereby the latter company's tracks, which pass the rear door of the car plant, are used for the moving of the cars to the siding where they can be transhipped.

The cars to be shipped are provided with temporary trucks, used specially for that purpose, saving the appearance of the regular trucks, which are taken to the shipping point by different means. The car bodies, mounted on the special tracks, are hauled to a siding where all shipments are made.



Method of Loading Electric Car Bodies for Shipment.

On the end of the siding track there is a ramp leading up from the street level, carrying tracks connecting with the street car line. This ramp rises to the level of the top of the flat car. On the top of the string of flat cars backed into the siding for the shipment there is laid a pair of light rails, spiked to the car top, connecting at the ramp end with the ramp rails. Up this ramp and along the car tops the car bodies on the temporary tracks are run into position over the car on which each body is to be placed.

The body is raised from the trucks and lowered on the car top by the means illustrated in the accompanying illustration. On each side of each end of the car body there are placed jacks of a peculiar design, carrying a cross bar between each end pair, which is run up under the car body sills. The jacks consist of a wooden base with two wooden uprights, between which there is carried a square threaded screw in a bearing about half way up the vertical supports. The top of the screw carries a crosshead, guided between the uprights. The screw supporting bearing carries an engaging nut, the outside of which is a bevel gear pinion. A horizontal shaft carries a mating bevel pinion. The outer end of the horizontal shaft carries a double lever by which the screw is raised or lowered. The very design speaks for a powerful lifting jack.

By these four jacks the car body is raised off the trucks, so that the latter clear. The trucks are then run from out under the car, and the temporary rail on the top of the car removed. Timbers of the form shown in the foreground in the illustration are then secured to the flat car, and the street car body lowered into the cradle thus formed. This jack arrangement is very convenient for loading car bodies.

The London St. Ry., at the end of October, voluntarily increased its motormen and conductors' wages as follows:—Spare men from 16c. to 18c. an hour; for remainder of 1st year's service from 18c. to 20c.; 2nd year's service, from 19c. to 21c.; 3rd year's service, from 19c. to 22c.; 4th year and thereafter, from 22c. to 23c.

The Toronto Railway's Employes Union is petitioning the city council to place restrictions upon the strength of lights used on automobiles, contending that the strong lights dazzle conductors, make it difficult to see pedestrians and vehicles, and cause accidents.

The British Columbia Electric Ry. Co. is reported to have commissioned Somerveil and Putnam, Vancouver, to prepare plans for a group of car houses to be built near False creek, Vancouver, to cost about $250,000.

A storage battery train of three cars has been built for the United Railways, of Havana, Cuba, for use on a seven mile suburban line where two or three car trains are needed during a certain few hours.

Marine Department.

Wireless Telegraphy on the Great Lakes.

The Dominion government has, during this year, had three wireless telegraph stations erected on the upper lakes, at Midland, Tobermory and Sault Ste. Marie, Ont., the Marconi Wireless Telegraph Co. of Canada, Ltd., being the contractors. These stations will work in conjunction with the one at Port Arthur, Ont., erected in Dec., 1910, by the Marconi Co., and now to be taken over by the government. A station at Sarnia is in course of construction, and other stations are to be built at Port Stanley, Port Colborne, Toronto and Kingston, Ont., which will also work in connection with the existing stations.

The erection of these stations on the great lakes is a continuation of the system of wireless telegraph stations in connection with the great waterways of Canada which was commenced in 1904 in the Straits of Belle Isle and at Cape Race, Newfoundland, and has been completed as far as Montreal. The great lakes branch, when completed, will also connect with Montreal.

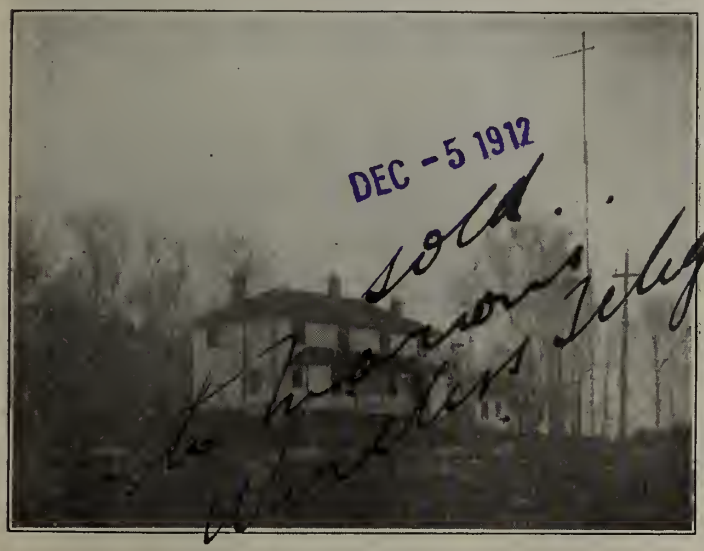
The main uses for which this system of stations is intended are:—(1) To aid navigation by enabling the masters of steamboats to communicate with the shore, their owners or agents and the ports which they have left or to which they are destined; (2) To provide similar facilities for passengers; (3) To provide direct communication between the points where shipping interests are centred without necessitating the use of the more circuitous routes of the land line telegraph for communication between these points.

The places that have been chosen on the great lakes will show at once how these interests have been considered. By the opening of navigation in 1913 all the main shipping points in the upper lakes, viz., Midland and Victoria Harbor, Sarnia, Sault Ste. Marie and Port Arthur, will be in direct communication with one another by wireless.

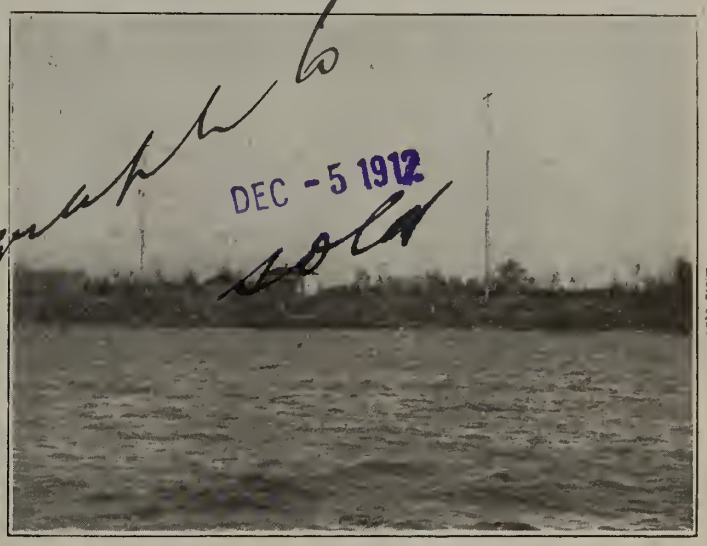
The necessity for stations on the great lakes, for their primary function, might be questioned by those unacquainted with the conditions. Steamboats probably find the greatest usefulness in wireless telegraphy when they are in close proximity to shore, leaving it, making a port, entering canals or narrow straits, and under other similar circumstances which occur very frequently with great lakes vessels. It must also be remembered that the larger of the great lakes are at certain seasons subject to exceedingly stormy weather, fogs, ice and cold, just as much as the oceans, and at such seasons constant communication with land or passing steamers is very acceptable.

EQUIPMENT OF STATIONS.—Each station requires a piece of land about 650 by 150 ft. There are erected two wooden masts, each 185 ft. high and 450 ft. apart. They are built in three sections, supported by a steel guy, and are 22 ins. in diameter at the bottom and 9 ins. at the top.

Each station is provided with two buildings, one double house containing two dwellings, and one station house separated from the dwelling house by about 50 ft. The dwelling houses provide accommodation for three men and have been made very comfortable. The station house is divided



Wireless Telegraph Station at Midland.



Wireless Telegraph Station at Tobermory.

Wireless Telegraph Station at Sault Ste. Marie.

Transmitting Machinery at Sault Ste. Marie.

into engine and transmitting room, operating room and office. All buildings are of wood with concrete foundations.

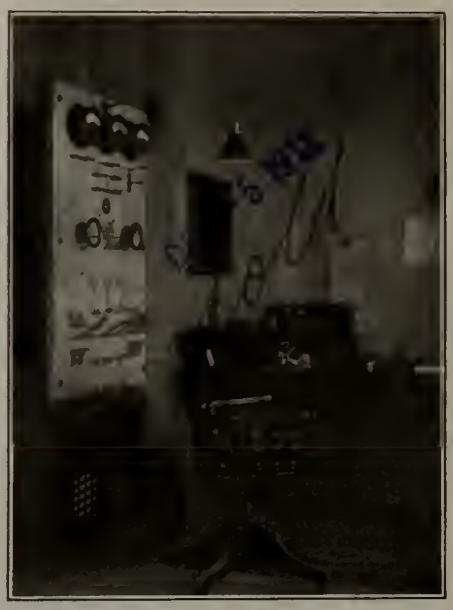
TRANSMITTING MACHINERY. — A standard type of transmitter is being installed at all the great lakes stations. It consists of a 10 h.p. 3 phase, 550 volt standard induction motor, worked by public power supply. The motor is directly connected through a flexible coupling to a special a.c. generator, generating a.c. at 440 volts and 240 cycles, and a spark discharger is attached to the a.c. generator and consists of an insulating disc attached to the generator shaft and rotating inside a muffler. It has 16 copper studs fixed radially in a copper rim (16 is the number of poles of the a.c. generator). Fixed in the muffler and insulated from it are two fixed electrodes adjustable radially and coming opposite to any two adjacent rotating disc studs; these fixed electrodes form the terminals of the spark gap and it is between their inner extremities and the points of the rotating studs that the spark occurs each time the latter come into a position exactly opposite the fixed electrodes. The fixed electrodes can also be adjusted in an angular direction. This adjustment allows their positon to be fixed so that the spark always occurs in a certain position relative to the a.c. generator pole pieces, and therefore relative to the curve of the impressed e.m.f. of the generator. It is arranged that this point shall be that point in each alternation at which the condenser, which forms an important part of the transmitter, has been charged to maximum voltage. All these complications in the design are necessary to enable the spark to be obtained absolutely free from arcing and giving a pure musical note. The vibration per second of the musical note is twice the a.c. generator frequency, in this case equal to 480 per second. The note is about equal to middle C on the piano. The remainder of the transmitter is of regular design consisting of a transformer for 240 cycle a.c. and specially constructed with regard to transformation ratio and magnetic leakage; various high and low tension adjusting and protective chokers and glass plate condenser capable of withstanding a voltage of 50,000 volts, and of a capacity of .06 m.f., high frequency primary and secondary inductances, and oscillation transformer. The transmitter is capable of emitting oscillations of any wave length between 600 and 1,700 metres, but is specially adjusted for wave lengths of 600 metres and 1,600 metres, the former being the standard wave length for ship communication and the latter being solely for communication with other great lakes stations.

The aerial wires are stretched between the two masts and are of phospher bronze wire 42|23 B. & S. gauge. They are supported by four strain insulators designed for a mechanical load of 1,500 lbs. and to withstand an electrical voltage of 100,000 volts, wet or dry.

The transmitting apparatus is completely duplicated at all stations. Where a public power supply is used one 8 h.p. Canadian Fairbanks-Morse special electric horizontal gasoline engine is installed to provide motive power in case of breakdown of the electric power supply. Where no public power supply is used and the engine is the main motive power, the engine is duplicated with the remainder of the transmitting gear. The only station of this latter type is at Tobermory.

Engine and Transmitter at Tobermory.

Transmitting Machinery at Tobermory.



Receiving Apparatus and Switchboard at Sault Ste. Marie.

The receiving apparatus is contained in a room entirely separate from the transmitters and consists of the Marconi type of valve receiver, with tuning apparatus capable of receiving similar wave lengths to those transmitted by each station, and the Marconi magnetic receiver is also installed as an emergency or duplicate. The accompanying illustration of the receiving room shows the operator's chair, with the receiving apparatus on the table, the switchboard completely controls the transmitting apparatus and can be manipulated by the operator without rising from his chair.

The Midland station is situated at the southeast corner of Georgian bay, half way between Midland and Victoria Harbor, both important transportation centres, and is in telephonic communication with both places. It is also connected direct with the land line telegraph system.

The Tobermory station is situated on Cape Hurd, at the junction of Georgian bay and Lake Huron and commands the whole of Lake Huron.

The Sault Ste. Marie, Ont., station is situated quite close to that town, and is in telephonic communication with the town and the Canadian canal offices, and is also to be connected to the C.P.R. telegraph system.

At Port Arthur preliminary preparation for converting it into a regular standard station have been commenced. This will entail considerable enlargement, and is necessary to enable the station to communicate with Sault Ste. Marie. The Port Arthur station has for two seasons maintained a service with steamboats; it is in telephonic communication with Port Arthur and Fort William, and is connected with the C.P.R. land line telegraph system.

As is well known, different climates offer conditions favorable or adverse to wireless telegraphy and these conditions influence the design of the station. Present experience shows the climate of the great lakes to be particularly favorable to wireless telegraphy in winter, but somewhat adverse to it during summer. During the latter season electrical disturbances are frequent, and these are always accompanied by disturbances to wireless telegraph receivers. In telephonic reception these disturbances evidence themselves by scratching and dull toned noises in the telephone, and it is when these electrical disturbances exist that the pure toned note of the transmitters installed on the great lakes is particularly advantageous. The same note is communicated to the telephone receiver and can be easily distinguished by the operator from the dull noise caused by the atmospheric disturbances.

EQUIPMENTS ON STEAMBOATS.— Now that the land facilities are being provided Canadian steamship owners on the great lakes have commenced to equip their vessels with wireless telegraphy. Up to the present 11 Canadian steamboats are operating it. These are:—

Canadian Pacific Ry.—Alberta, Keewatin,

Assiniboia, Athabasca, Manitoba.

Northern Navigation Co.—Huronic, Hamonic, Saronic.

Canadian Towing and Wrecking Co.—Barges Imperial, Empire, Provence.

It is expected that during this winter there will be considerable activity in the fitting of other Canadian great lakes steamboats with wireless telegraphy. A large number of these vessels trade with United States ports, and the legislation with which the U.S. followed up the Titanic disaster makes equipment with wireless telegraphy compulsory with all vessels trading in U.S. ports. This legislation for the great lakes comes into effect on April 1 next, and requires all vessels carrying over 50 people to have a correctly licensed and operated installation. Full particulars of it are contained in a circular, "Regulations for radio apparatus and operators on steamers," issued by the Commerce and Labor Department at Washington, D.C., Sept. 5.

Since the foregoing article was written it has been announced that the contract between the Dominion government and the Marconi Wireless Telegraph Co. of Canada provides for the operation of nine wireless stations on the great lakes, four of which are in operation, one under construction, and the remaining four to be commenced probably next year. As soon as all these stations have been completed the company will be in receipt of a subsidy of $31,500 a year from the government for the operation of all the stations. The agreement is said to be for 19 years.

An interim report has been submitted to the Dominion government by Professor Barnes, of McGill University, Montreal, on his investigations of methods whereby ships may be warned of the nearness of ice or land. It is said that a government vessel will be placed at his disposal next spring to enable him to continue his investigations and experiments.

Notwithstanding earlier reports that the Dominion Government steamship Minto had found ice conditions so unfavorable at Wolstenholme, in the Hudson straits, that she had returned to winter in Hudson bay, she arrived in Halifax Nov. 11. Capt. Anderson is reported to have stated that the conditions for navigating the straits could not have been better.

The Canadian Interlake Line's Vessel Fordonian

This vessel, which has been built recently at Port Glasgow, Scotland, has been referred to in several recent issues of Canadian Railway and Marine World. The following additional particulars have been received:—

The vessel is 2,368 gross tons. The leading dimensions are:—Length, 250 ft.; beam, 42½ ft.; depth, 26½ ft. She has been built to Lloyd's highest class for the grain carrying trade of the great lakes. The propelling machinery consists of a four cylinder set of the Diesel two stroke cycle engine. The engines are placed right aft, and the exhaust, after passing through a silencer, is led overboard under the counter. The cylinder dimensions are 18⅛ in. in diameter, with a 32¼ in. stroke. The main features are the standard marine frames for the cylinders, with the open and accessible crank case, marine connecting rods, cross heads, and built up crank shaft. The scavenging pumps are driven by links off the cross heads. The pumps are double acting, of 27½ in. diameter, and 23½ in. stroke. The main engines develop 750 brake horse power at a nomal speed of 120 revolutions a minute. Compressed air is supplied by compressor. One is driven off the forward end of the main engine crank shaft, while the auxiliary set is steam driven. The steam for this and for the steering gear, winches and capstans is generated in an oil fired donkey boiler on deck.

With Diesel engines it has become regular practice to test the engine against the brake for some time in the shop prior to installing it in the ship in order to make minor adjustments more readily, as brake horse power, fuel and water consumptions can be measured for guidance. With the engines of the Fordonian this was not possible, and yet, although the engines had only run for short periods, totalling 12 hours, on dock trials, the results of the trial trip on Sept. 21 were entirely satisfactory, demonstrating the state of efficiency for marine propulsion to which this type of prime mover has so quickly been brought.

A speed of 10 knots was exceeded, which is better than the rate achieved with single screw ships of the same type having steam engines of 950 i.h.p. The revolutions were 120 a minute, and the manoeuvring, stopping, starting, and reversing corresponded exactly to those which would be required in passing through a series of locks. Sixty-three reversals were accomplished in 42 minutes, and at the end of this trial more than half of the stored compressed air was still available. The steam driven air compressor was, of course, running. Complete reversal from full speed ahead to full speed astern occupied six seconds, and the engines were stopped dead from full speed in three revolutions. Although a fairly heavy fly wheel is fitted, the slowest speed at which the engine turned when all cylinders were firing was 46; but when final tuning up has been done, and all fuel valves are so adjusted that each cylinder is receiving exactly the same quantity of oil, 35 revolutions a minute will be the minimum working speed on fuel. The running of the engine was very silent; the engine room is 33% shorter than would be the case for steam machinery; the fuel consumption was 0.47 lb. per brake horse power per hour throughout the trial; the engine room was free from smoke and vapour, and was cool.

Press reports state that as a result of the investigation of the loss of the s.s. Keystorm, E. Adams, chairman of the Board of Inspectors of Steam Vessels, has resigned, and that the Minister of Marine is taking steps to put the matter of inspection, and of the enforcement of the navigation laws, upon a more rigorous basis.

The shipbuilding now in progress in the yards of Great Britain and Ireland exceeds all previous records. The total number of vessels in progress is 587, representing a total tonnage of 2,341,367 tons. This is an increase of 25% over the tonnage under construction a year ago. Ship yards are experiencing difficulty in getting workmen enough to keep pace with the demand, and many yards are working overtime and double shifts. Not only is the activity in shipbuilding unprecedented, but the prospects of future activity are promising. Orders for new vessels are being received faster than the completed vessels are turned out of the yards.

List of Steam Vessels Registered in Canada during September, 1912

Name.	No.	Where and When Built.	Engines, etc.	Length	Breadth	Depth	Gross Tons	Reg. Tons	Port of Registry	Owner or Managing Owner
Boonton	131211	Philadelphia, Pa., 1871	Screw 48 n.h.p.	75.0	18.5	8.9	115	53	Sydney	Rudderham, North Sydney, N.S.
Carillon	131124	Montreal, 1912	" 16½ "	57.3	14.5	6.7	41	24	Ottawa	Minister of Railways and Canals, Ottawa
Casarco 4	131192	Bear River, N.S., 1912	" 2 "	45.4	12.2	5.6	15	10	St. Andrews	Canadian Sardine Co., St. Andrews, N.S.
Casarco 5	131191	Bear River, N.S., 1912	" 3 "	45.4	12.2	5.6	14	10	St. Andrews	" " " " "
Ewayea	131004	St. John, N.B., 1912	" 3 "	39.5	8.7	4.6	15	10	St. John, N.B.	J. F. Williamson, St. John, N.B.
Fairfax	111966	Grand Haven, Mich., 1890	" 85 "	209.0	38.0	21.0	1424	984	Picton, Ont.	Ontario & Quebec Navigation Co., Picton, Ont.
Helen F.	130894	Seattle, Wash., 1910	" 1¼ "	32.0	9.3	3.5	8	4	Victoria	J. F. Norton, Sydney, B.C.
I Wonder Y.	130594	Sambro, N.S., 1912	" ½ "	48.6	12.8	6.0	17	16	Halifax	W. S. Henneberry, Sambro, N.S.
Invermere	130892	Golden, B.C., 1912	" 1½ "	75.0	13.0	3.7	66	45	Victoria	A. Blakley, Golden, B.C.
Lachine	131125	Montreal, 1912	" 16½ "	40.0	13.8	6.4	26	15	Ottawa	Minister of Railways and Canals, Ottawa
Mekinac	131012	Three Rivers, Que., 1912	" 9¼ "	70.8	27.2	5.3	65	23	Quebec	R. F. Grant, Three Rivers, Que.
Neophyte	130990	Amsterdam, Holland, 1903		107.0	20.7	6.2	150	97	Chatham, N.B.	Navigation Syndicate, Nordin, N.B.
Ondot	130893	Proctor, B.C., 1912	" 9½ "	59.0	12.0	5.5	30	20	Victoria	F. Cogle, Proctor, B.C.
Point Ellice	130897	N. Vancouver, B.C., 1911	" 47 "	79.6	20.0	11.6	163	69	Victoria	Minister of Public Works, Ottawa
Rockland	131126	Rockland, Ont., 1912	" 6½ "	76 8	16.8	6.8	75	38	Ottawa	Hawkesbury Lumber Co., Ottawa
San Felice	131158	Seattle, Wash., 1910	" 2 "	46.0	11.4	5.2	20	14	Vancouver	R. J. Cromie, Vancouver, B.C.
Speedy II	104920	Leith, G.B., 1896	" 88 "	115.0	20.6	10.6	252	145	Ottawa	Minister of Public Works, Ottawa
Wake (The)	131159	Vancouver, B.C., 1912	" 2 "	41.0	11.2	4.0	18	12	Vancouver	A. McEvoy, Vancouver, B.C.

List of Sailing Vessels and Barges Registered in Canada during September, 1912

Name.	No.	Where and When Built.	Rig.	Length	Breadth	Depth	Reg. Tons	Port of Registry.	Owner or Managing Owner
Dredge P.W.D. no. 301	130896	New Westminster, 1908	Dredge	108.3	38.2	10.4	538	Victoria	Minister of Public Works, Ottawa
Lyra	188265	Cambridge, N.B. 1883	Schr.	83.1	27.3	7.0	99	Parrsboro, N.S.	R. Newcombe, Parrsboro, N.S.
Marona	130595	Tancook, N.S., 1912	Schr.	49.2	13.0	6.9	25	Halifax	E. and A. Parker, Owls Head, N.S.
New Brunswick no. 1	131003	Upper Gagetown, N.B., 1912	Dredge	75.3	30.1	6.8	244	St. John, N.B.	New Brunswick Construction Co., Welsford, N.B.
Rock Cutter P.W.D. no. 1	130895	Victoria, B.C., 1911	Dredge	100.0	36.5	7.6	222	Victoria	Minister of Public Works, Ottawa
Saint John	131002	U.S.A., (Unk)	Dredge	115.1	48.4	14.0	941	St. John, N.B.	Beaver Dredging Co., St. John, N.B.

Harbor Improvements at Fort William.

A large amount of work has been done at Fort William harbor during this year, and it is claimed that this amounts to 27% of all the harbor work done in Canada this year. Unconfirmed reports say that the following work will be gone on with next year:—

A series of eight slips, 1,000 by 500 ft., on the south side of the Kaministiquia river between the Mission river and the Grand Trunk Pacific Ry. bridge. The slips will be on G.T.P.R. property, and are to be dredged out to permit of additional water frontage and constitute a part of a scheme of increased freight docks and other facilities which the G.T.P.R. has in hand.

Island One on C.P.R. property, according to government reports, is to be improved by the addition of seven new slips near the mouth of the Kaministiquia river.

Twenty-five acres are to be dredged and removed out of the Kaministiquia river almost immediately opposite the Canadian Car and Foundry Co.'s plant near the western limits of the city. By this means the river will be straightened and a turning basin over 1,000 ft. wide will be formed. The natural depth of the river at this point is 35 ft., and the dredging to be done will be uniform with this depth. It is also said that dredging is to be continued for some distance beyond the city limits.

Panama Canal Tolls.

The United States President has fixed the following tolls for vessels using the Panama canal:—

On merchant vessels carrying passengers or cargo, $1.20 per net vessel ton—each 100 cu. ft.—of actual earning capacity.

On vessels in ballast without passengers or cargo, 40% less than the rate of tolls for vessels with passengers or cargo.

Upon naval vessels, other than transports, colliers, hospital ships and supply ships, 50 cents per displacement ton.

Upon army and navy transports, colliers, hospital ships and supply ships, $1.20 per net ton, the vessels to be measured by the same rules as are employed in determining the net tonnage of merchant vessels.

Under the legislation enacted by Congress United States coastwise shipping will be exempted from tolls.

Extension of Lighting Period on Great Lakes.

The Marine Department has issue the following notice:—

All Canadian lights and fog alarms in Lake Superior will be kept in operation this autumn until Dec. 15, or later if the season of navigation will permit, with the exception of Caribou island, Otter island, Michipicoten island, Gargantua, Michipicoten harbor, and Corbeil point lights, from which stations the keepers may be removed at any time after Dec. 1. Mariners must not rely on finding any of these lights in operation later than the dates above specified for closing.

All Canadian lights and fog alarms in Lake Huron, Georgian bay, Lake St. Clair, Lake Erie, Lake Ontario, and connecting waters will be kept in operation until Dec. 15, except Southeast shoal lightship, Lake Erie, which may be removed from her station not earlier than Dec. 5; and also Lonely island light in Georgian bay, which may be closed and the keeper taken ashore on Dec. 5.

Vessels Removed From the Register.

The following vessels were removed from the register during September for the reasons assigned:—

STEAM.—Arlington, Toronto, 16 tons, burnt; Arthur Mack, Port Stanley, Ont., 46 tons, broken up; Chummy, Ottawa, 4 tons, broken up; Emma, Toronto, 94 tons, burnt; J. L. Beckwith, Sault Ste. Marie, Ont., 33 tons, wrecked; Scotia, Port Stanley, Ont., 9 tons, broken up; Shawanaga, Toronto, 65 tons, broken up; William Hackett, Quebec, 86 tons, lost; Wobun, Picton, N.S., 990 tons, sold to Dutch subjects.

SAILING.—Amanda, Yarmouth, N.S., 15 tons, broken up; Fannie W. Freeman, Shel-

List of Steam Vessels Registered in Canada During October, 1912

No.	Name	Port of Registry	When and Where Built	Length	Breadth	Depth	Gross Tons	Reg. Tons	Engines, etc.	Owner or Managing Owner.
*131053	Arikokan	Port Arthur	West Superior, Wisc., 1895	362 0	38.8	18.0	2004	1315	144 sc.	F. S. Wiley, Port Arthur, Ont.
130866	Birdswell	New Westminster	Ladner, B.C., 1912	106.6	24.0	9.0	217	129	20 sc.	I. Whitworth, Ladner, B.C.
131193	Casarco No. 2	St. Andrews	Pt. Hawkesbury, N.S., 1912.	69.7	16.6	6.7	35	25	4¼ sc.	Canadian Sardine Co., St. Andrews, N.B.
131194	Casarco No. 3	St. Andrews	Mahone Bay, N.S., 1912.	73.3	16.4	7.0	39	34	3¼ sc.	" " "
131198	Casarco No. 12	St. Andrews	Lunenburg, N.S., 1912	50.0	12.7	5.5	15	12	1¼ sc.	" " "
130865	Chorcboy	New Westminster	New Westminster, B.C., 1911	35.2	9.6	3.0	11	8	1½ sc.	J. W. Pike, New Westminster, B.C.
131127	Chummy	Ottawa	Rockland, Ont., 1912	49.4	9.8	4.4	22	12	2 sc.	W. E. Beaton, Ottawa, Ont.
131160	Daphrona	Vancouver	Hong Kong, 1912	57.3	13.0	8.0	41	28	3½ sc.	W. F. Brougham, Vancouver,
133701	Elizabeth	Vancouver	Seattle, Wash., 1908	53.6	16.0	5.6	37	25	3¾ sc.	G. A. Barrett, Vancouver, B.C.
130898	Errand Boy	Victoria	Bonners Ferry, Idaho, 1902	43.8	9.0	3.7	12	8	2 sc.	W. W. West, Nelson, B.C.
130238	Frank H. Stanley	Port Stanley	Port Stanley, Ont., 1912	66.0	15.0	7.5	43	29	10½ sc.	H. L. Moore and W. S. Stanton, P. Stanley, Ont.
133702	Iverernig	Vancouver	Vancouver, B.C., 1912	42.0	9.8	4.8	16	11	1½ sc.	J. C. Keith, Vancouver, B.C.
131111	Keybell	Montreal	Collingwood, Ont., 1912	258.0	42.6	17.2	1730	1254	95½ sc.	Keystone Transportation Co. of Can., Montreal.
†104263	Kwasind	Quebec	Sunderland, 1894	297.0	40.0	21.7	2211	1376	333 sc.	Arctic Steamship Co., Quebec.
126860	L. Robidoux	Sorel	Yamaska, Que., 1912	50.0	14.8	6.4	43	21	24 sc.	M. Robidoux, Yamaska, Que.
131013	La Jeannette	Quebec	Chicoutimi, Que., 1910	28.8	9.6	2.7	12	8	¾ sc.	A. Girard, St. Anne, Que.
133703	Lureda	Vancouver	Vancouver, B.C., 1912	34.2	8.0	4.1	10	7	½ sc.	T. F. Greenhow, Vancouver.
26599	Mary Blanche	Parrsboro'	Port Greville, N.S., 1912	61.2	16.0	6.0	44	25	2¼ sc.	J. W. Cochrane, Fox River, N.S.
107689	MissVandenburg	Prescott	Wilmington, Del., 1909	97.8	20.9	9.0	266	181	10 sc.	Prescott & Ogdensburg Ferry Co., Prescott, Ont
105040	Orontes	Vancouver	Beverley, G.B., 1895	111.5	21.0	11.5	178	76	60 sc.	Wallace Fisherics, Vancouver.
133704	Owasco	Vancouver	Unknown (U.S.A.)	40.0	11.0	5.5	18	16	¾ sc.	C. F. Perry, Vancouver, B.C.
131212	Susibell	Sydney, N.S.	Sydney, N.S., 1907	38.0	8.2	4.1	8	6	1½ sc.	W. A. Fitch, Sydney, N.S.
131131	Thelma C	Lunenburg	Little Tancook, N.S., 1912	40.6	10.5	6.4	14	13	⅔ sc.	F. Cleveland, South West Cove, N.S.
111965	Wiley M. Egan	Picton, Ont.	Cleveland, O., 1887	258.8	39.6	20.0	1733	1255	105 sc.	Ontario & Quebec Navigation Co., Picton, Ont.
130196	Yankee Boy	New Westminster	Tacoma, U.S.A., 1910	42.0	12.8	5.9	18	13	1¼ sc.	A. Radoslorich, Port Guichon, B.C.

*Foreign name—John B. Trevor. †Formerly Turret Bell.

List of Sailing Vessels Registered in Canada During October, 1912

No.	Name	Port of Registry	Rig	When and Where Built	Length	Breadth	Depth	Reg. Tons.	Owner or Managing Owner
130596	A. Hubley	Halifax	Schr.	Shelburne, N.S., 1912	91.3	20.5	9.1	69	A. Hubley et al., St. Margaret's Bay, N.S.
126600	Dannebrog	Parrsboro'	"	Port Greville, N.S., 1912.	105.4	25.3	9.6	100	J. E. Roberts, New York
*131110	Dominicoal No. 2	Montreal	Scow	Chicago, Ill., 1900	138.1	31.8	6.2	234	Dominion Coal Co., Sydney, N.S.
131112	Edouard D	Montreal	Sloop	Notre Dame de Pierreville, Que., 1903	96.5	21.4	5.4	93	G. Deschenaux, Notre Dame dePierreville, Que.
131213	Elizabeth Donovan	Sydney, N.S.	Schr.	Ingonish, N.S., 1912	41.0	12.6	8.0	11	W. T. Donovan, Ingonish, N.S.
130428	Fanny May	St. Andrews	Schr.	Campo Bello, N.B., 1911	51.1	15.3	7.0	25	W. McLellan, Campo Bello, N.B.
130250	Geraldine D	Liverpool	"	Liverpool, N.S., 1912	84.8	29.2	9.3	96	C. LeBlanc, Arichat, N.S.
131162	Ida M. Zinck	Lunenburg	"	Liverpool, N.S., 1912	177.2	27.4	10.6	113	E. Zinck, M.O., Lunenburg, N.S.
130862	J. W. P. No. 3	New Westminster	Barge	New W'minster, B.C. 1912	90.0	30.0	8.0	202	J. W. Pike, New Westminster, B.C.
131086	J. E. Russell's Drill Boat, No. 6	Toronto	Drill boat	Toronto, Ont., 1912	80.0	30.0	5.3	289	J. E. Russell, Toronto.
130626	Joseph Lester	Yarmouth	Schr.	Pubnico, N.S., 1912	41.0	12.4	5.0	15	J. R. Amiro, West Pubnico, N.S.
130863	P. D. C. 3	New Westminster	Dredge	New W'minster, B.C., 1908	66.0	17.5	5.3	119	J. Wm. Pike, New Westminster, B.C.
130864	P. D. C. 4	" "	"	" " 1909	85.0	32.5	6.5	338	" " "
133705	P.S.B. Co. No. 2.	Vancouver	Scow	N. Vancouver, B.C., 1910	81.5	29.8	7.7	180	Progressive Steamboat Co., Vancouver, B.C.
133706	P.S.B. Co. No. 5.	Vancouver	"	Vancouver, B.C., 1910	82.8	30.1	7.7	177	" " "
131128	P.W.D. No. 110	Ottawa	Dredge	Kingston, Ont., 1896	109.4	40.6	8.4	458	Minister of Public Works, Ottawa.
131129	P.W.D. No. 116	Ottawa	"	Sorel, Que., 1904	91.0	34.3	8.2	376	" " "
131214	Phœbe Jordon	Sydney, N.S.	Schr.	South Ingonish, N.S., 1911	40.6	11.8	7.8	15	J. C. Williams, South Ingonish, N.S.
130763	Sand Boy	Kingston	Scow	Kingston, Ont., 1912	82.8	22.8	6.0	92	G. Pike, Wolfe Island, Ont.
131041	W. Robidoux	Sorel	Dredge	Yamaska, Que., 1912	85.4	25.4	6.0	128	M. Robidoux, Yamaska, Que.

*Foreign name—Scow No. 2.

burne, N.S., 79 tons, transferred to St. Johns, Nfld.; Little Annie, Weymouth, N.S., 16 tons, broken up; Swallow, St. John, N.B., 90 tons, broken up.

The following vessels were removed from the register during October:—

STEAM:—Alert, Vancouver, 8 tons, broken up; Corinthia, St. John, N.B., 39 tons, sold to foreigners; Damara, Vancouver, 3,219 tons, sold to foreigners; Ella and Jennie, St. Andrews, N.B., 25 tons, sunk in collision; Hope, St. John, N.B., 162 tons, broken up.

SAILING:—Arizona, Yarmouth, N.S., 85 tons, stranded; Ethel, Yarmouth, 93 tons, abandoned at sea; H. C. Corson, Sydney, N.S., 38 tons, burnt; Monica A. Thomas, Halifax, N.S., 46 tons, burnt; Nina S., Halifax, 19 tons, burnt; Recruit, Toronto, 297 tons, broken up; Venture, Charlottetown, P.E.I., 43 tons, wrecked.

Sault Ste. Marie Canals Traffic.

The following commerce passed through the Sault Ste. Marie Canals during October, 1912:

Articles			Canadian Canal	U.S. Canal	Total
Copper	Easthound	Short tons	1,073	15,126	16,204
Grain	"	Bushels	3,053,569	5,421,684	8,475,253
Building stone	"	Short tons			
Flour	"	Barrels	299,480	1,260,383	1,559,863
Iron ore	"	Short tons	4,827,212	2,253,776	7,080,988
Pig iron	"		1 325	5,768	7,093
Lumber	"	M. ft. b.m.	3,059	86,883	89,942
Silver ore	"	Short tons			
Wheat	"	Bushels	20,226,471	13,236,924	33,463,395
General merchandise	"	Short tons	4,323	36,023	40,346
Passengers	"	Number	618	824	1,442
Coal, hard	Westhound	Short tons	84,945	275,958	360,903
Coal, soft	"		298,946	1,093,965	1,392,911
Flour	"	Barrels			
Grain	"	Bushels			
Manufactured iron	"	Short tons	38,460	37,151	75,611
Iron ore	"	"			
Salt	"	Barrels	8,155	71,613	79,768
General merchandise	"	Short tons	112,424	121,948	234,372
Passengers	"	Number	1,002	189	1,191
Vessel passages		Number	1,157	2,198	3,355
Registered tonnage		Net	3,834,194	4,742,266	8,576,460
Freight—Eastbound		Short tons	5,543,633	3,097,454	8,641,087
" —Westbound		"	535,940	1,539,764	2,075,704
Total freight		"	6,079,573	4,637,218	10,716,791

The Running Aground of the s.s. Royal George.

The s.s. Royal George, owned by the Canadian Northern Steamships, Ltd., while making her last trip to Quebec for the season, ran aground about a mile east of Point St. Lawrence, Isle of Orleans, on Nov. 5, at 5.10 p.m. It was high tide at the time, and although there was a thin fog, the vessel is said to have been running from 16 to 18 knots an hour, with the view of making port the same evening. The grounding took place on the north shore of the south channel, and the receding tide soon left the vessel in such a condition that the tugs and other steamboats which went to her aid were unable to get close enough to render any practical help. At low tide there was only 6 ft. of water over the rocks, and as the vessel is 60 ft. from keel to boat deck, her position was regarded as precarious. The Quebec and Levis Ferry Co.'s steamboat North took off about 400 of the passengers early on the morning of Nov. 6. A severe storm which came up, with a hurricane wind, prevented the remainder of the 901 passengers being taken off until the morning of Nov. 8. Lighters were requisitioned to take off baggage and cargo. With the passing of the spring tides the hopes of towing the vessel off had to be given up, and on Nov. 11 the company announced its intention of abandoning her to the underwriters, this being done as a precautionary measure. As this is being written (Nov. 15) it is not likely that any attempts will be made to haul the vessel off until the spring tides, commencing Nov. 24, which will be at the highest about Nov. 26. Divers have examined the hull in order to ascertain the damage, and all the cargo possible has been lightered.

D. B. Hanna, Second Vice President, is reported as stating that the vessel was insured for $1,275,000, while the cost of replacing her would be from $1,700,000 to $2,000,000. The floating dry dock at Montreal is ready to receive the vessel, and the Vickers Co. is prepared to make all the repairs necessary.

The Royal George was built by the Fairfield Shipbuilding Co., Glasgow, Scotland, in 1907, for the Mediterranean traffic, and was then known as the Heliopolis. With her sister ship as the Cairo she was bought by the Canadian Northern Steamships, Ltd., and partially rebuilt for the trans Atlantic trade, for which they are eminently adapted and have become exceedingly popular on account of their speed and excellence of accommodation. Her dimensions are:—Length, 545 ft.; beam, 60 ft. 3 ins.; depth, to shelter deck, 38 ft.; tonnage, 11,000. The machinery consists of three sets of compound steam turbines, one h.p. turbine in the centre, and a l.p. turbine on either side, having a collective power of 18,000 i.h.p., at 340 shaft revolutions. The vessels developed 21 knots an hour on their trial trips, and in actual service have maintained 19 knots an hour. A full description of the vessels as rebuilt was given in Canadian Railway and Marine World for April, 1910.

Capt. Saunders, New York, and Capt. Parry-Jones, Cleveland, Ohio, arrived in Quebec, Nov. 12, and took charge of the vessel on behalf of Lloyds, and are superintending the salvage operations. Capt. H. St. G. Lindsay, the Dominion Wreck Commissioner, arrived in Quebec, Nov 16, to conduct an investigation into the circumstances attending the wreck.

THE RELEASE OF THE VESSEL.

After the above had been put in type the vessel was released on Nov. 24 at 4 p.m., when the tide reached 21.2 ft. forward. The Quebec Salvage and Wrecking Co.'s steamship Strathcona pulled the Royal George into deep water, and the latter left for Quebec at 6 p.m. under her own steam, arriving there at 7 p.m., when she entered the Louise basin. An examination showed that she was damaged considerably less than expected, and it was hoped that temporary repairs would be completed so that she might start to recross the Atlantic a few days thereafter.

Atlantic and Pacific Ocean Marine.

Capt. Wylie, for many years a commander on the Allan Line, died in London, Eng., Oct. 31.

The Canada Line, press reports state, has under construction two 13,000 tons steamships for next year's traffic between Montreal and Liverpool.

Uncomfirmed press reports state that a steamship service is to be established in the fall of 1913 by the G.T.R. between a Canadian port and Antwerp.

The C.P.R. has arranged that its trans-Atlantic steamers will, during the current winter season, make 11 more sailings from St. John, N.B., than last season.

During this year's navigation to Oct. 31 there arrived at Montreal 655 vessels of 2,141,053 tons from the ocean, against 694 vessels of 2,116,275 tons during 1911.

Herr Ballin, director of the Hamburg-American Line, was in Montreal, Oct. 31, discussing arrangements for an extension of that company's sailings to Canadian ports.

The Shipping Federation of Canada proposes to ask the Dominion Government to appoint a commission to investigate the pilotage system between Father Point and Quebec.

It is reported that Capt. Beetham of the C.P.R. s.s. Empress of India will be appointed to the command of the new s.s. Empress of Russia, which will be put on the Vancouver-Japan-China route early in 1913.

The steamship Keshrel, which has been sold out of the Dominion Government service, is being fitted up at Victoria, B.C., to be put on a run from Fanning island, the midocean station of the Pacific cable, to Honolulu.

During October 53 ocean going steamships of 382,658 tons arrived in Montreal. Only one of these was a tramp, which was, however, consigned to the Elder-Dempster Co. The Allan Line, with 12 steamships of 111,919 tons, headed the list.

During the six months ended Sept. 30, the number of vessels arriving at and departing from Victoria, B.C., in the ocean trade was 1,957. During October 168 vessels of 198,256 tons arrived, and 199 vessels of 182,038 tons sailed from the port.

The Allan Line s.s. Poweraman has arrived in St. Johns, Nfld., after having undergone a thorough overhauling. The passenger accommodation has been increased and modernized, the vessel now providing for 70 saloon and 160 steerage passengers.

The Thomson Line s.s. Bellona ran aground in the Upper Traverse below Quebec, Oct. 31. Shortly after the grounding Capt. Cunningham had a paralytic seizure and was removed to the hospital at Quebec, Nov. 2. The stranded vessel was floated Nov. 5, and reached Quebec Nov. 6.

The New Zealand Shipping Co. has declared a dividend of 15s. a share on the operations of 1911-12, after placing £30,000 to the credit of the insurance fund, and carrying £21,555 forward to the current account. The company has acquired the Australian business of Houlder Bros. and Co.

News was received in Montreal Nov. 13 of the death in England of Capt. Jas. Wylie, who retired from the Allan Line service in 1888. When 21 years of age he was in command of the Allan Co.'s ship Albion, and commanded in succession the steamships added to the fleet until his retirement.

Capt. Morrisby was the recipient of several presents, Oct. 25, on relinquishing

the command of the Canadian-Australian steamship Marawa. He has been appointed to the Makura, succeeding Capt. Gibbs, who takes command of the company's new steamship Niagara. He is succeeded on the Marawa by Capt. J. T. Rolls.

The Admiralty Court in London, Eng., gave judgment, Oct. 31, in the action arising out of the loss of the s.s. Helvetia, after collision with the s.s. Empress of Britain, on the St. Lawrence in July. The court found that while blame was attachable to both vessels the principal fault lay with the Helvetia, the owners of which must pay seven-twelfths of the damage.

The Plant Steamship Co.'s new steamship Evangeline arrived in Halifax, N.S., from the builders' yard in Scotland, Oct. 30. She left Greenock, Oct. 17, and had rather a rough trip, but proved to be a good seaboat. H. L. Chipman, the company's representative in Halifax, who came over on her, states that a sister ship to the Evangeline is to be built the season of 1914.

E. C. Fry, Lloyd's agent at Quebec, considers that if the British marine underwriters are reluctant to assume risks on the St. Lawrence route after Nov. 25, the Dominion Government should subsidize trans-Atlantic vessels using the route after that date to the amount of the increased cost of insurance. He believes the navigation is quite safe until Dec. 15 at least. In the old days of wooden ships, he said, the date for the expiry of insurance was Oct. 1.

The Shipping Federation of Canada has complained to the St. John, N.B., city council and to the Government about tax of $7.50 levied on laborers taken into St. John for the winter navigation season. About 200 men are annually taken from Montreal to St. John by the steamship companies in order to provide the necessary skilled labor for loading and unloading trans-Atlantic vessels. The St. John council has informed the Federation that it cannot be expected to supply all the civic benefits gratis to those who are only half yearly residents.

The Head Line steamship Bengore Head, stranded northeast of the Flower Island light in the Straits of Belle Isle early in October, was floated and taken to Quebec, where it was found that she was but slightly damaged. After temporary repairs she sailed for Dublin, Ireland. The investigation by the Wreck Commissioners' Court at Quebec was concluded Oct. 30 and judgment was reserved. A special point for consideration is whether the court has jurisdiction, as the vessel is registered in Ireland and the grounding occurred in Newfoundland waters.

Maritime Provinces and Newfoundland.

The old sealing steamboat Diana, of St. John's, Nfld., is undergoing extensive repairs at Halifax, N.S.

Reports from Indiantown, N.B., state that a company is being formed there to operate a steamboat between St. John and Wickham.

The Halifax, N.S., city council has determined to reconsider its decision of having twin docks built at the Halifax terminal of the Dartmouth ferry.

The Dominion Coal Co.'s tug, Douglas H. Thomas, sank in Halifax harbor Nov. 13, after having been run into by the steamship City of Sidney.

The Dominion Public Works Department has let a contract for the dredging of the harbor at Seaforth, N.S., to the Halifax Dredging Co. at a cost of $17,300.

The Cape Breton Electric Co. is negotiating for the purchase of the steamboat Henry C. Eaton from the Frontier Navigation Co., Calais, Me., for ferry purposes at Sydney, N.S.

The contract for the building of the marine wharf at Carleton, in the harbor at St. John, N.B., is reported to have been let to F. L. Boone, St. Mary's Ferry, N.B. The estimated cost is $185,000.

The Dominion Coal Co.'s chartered steamships, running between Sydney, N.S., and Montreal, Que., carry Chinese crews. The navigating and engineering officers are British, but the entire working crews are Chinese.

The steamship Wilhelmina went on the dry dock at St. Johns, Nfld., for extensive repairs, Nov. 16. The contract price is said to be $30,000, and it is biggest piece of work undertaken by the Reid Newfoundland Co. at the docks.

The Dominion Coal Co.'s chartered collier, Glace Bay, arrived at Sydney, N.S., from the builders' yards, Newcastle-on-Tyne, Eng., recently, and was at once put on the trade carrying coal to Montreal. She has a deadweight capacity of 11,000 tons.

The Nova Scotia Construction Co. received Nov. 12 at Halifax from the builder's yard at Liverpool, N.S., a large scow for use on the new harbor works. It is filled with six steam engines for operating the pile driving machines. There are 1,000 concrete piles, of about 16 tons each, to be driven at the new terminal immigration pier under construction.

According to an Ottawa press despatch the Shipping Federation of Canada has protested to the Minister of Marine against the action of Wreck Commissioner Lindsay in investigating the grounding of the s.s. Bengore Head in the Straits of Belle Isle. The accident, it is claimed, took place in Newfoundland waters, and the jurisdiction of the Wreck Commissioner is questioned.

The Crystal Stream Steamship Co. has purchased a new steamboat to be placed on the St. John river between St. John and Fredericton, N.B., next season. The steamboat it now being operated in the vicinity of New York, and is to be delivered during the winter. J. Purvis, representing the company, is reported as stating that the new boat is of modern type steel construction, 160 ft. long, with 5 ft. draught. She is capable of making 18 miles an hour, and has accommodation for 600 passengers.

Province of Quebec Marine.

It is said that the Dominion Government has decided to build a dry dock at Quebec as a public work.

The Quebec Harbor Commissioners extended the time for receiving tenders for the building of a 1,000,000 bush. capacity elevator on the Prince Louise Embankment to Nov. 30.

The Nova Scotia Steel and Coal Co.'s s.s. Gladstone, from Sydney, N.S., to Montreal, with coal, grounded at St. Laurent, Isle of Orleans, Nov. 5, and received considerable damage.
The vessel was released from the rocks and towed into Quebec Nov. 13.

Hon. L. P. Pelletier, Postmaster General, in a speech at Quebec, Nov. 5, stated that it had been finally decided that the location of the dry dock for Quebec will be at Lauzon, near Levis, and that it will be built by the Dominion Government as a national work.

The Aurelie G., the new tug built in Glasgow, Scotland, for the Sincennes-McNaughton Co., Montreal, had reached a point 700 miles west of the Irish coast, when stress of weather compelled her to return. It has been decided that she will remain in Glasgow for the winter.

The Steamboat Cecilia L sank at Ile Perrot on Lake St. Louis, Montreal, with the loss of 12 lives, Nov. 2. She traded between Valleyfield and Montreal, was built of wood, and had a capacity of 175 tons. She was caught in a gale, and driven on the rocks, and broke up in a few minutes. Of the 17 persons on board, four only were saved.

The statistics of vessels passing through the Lachine canal for October showed that they carried 5,031,600 bush. of wheat; 495,613 bush. of oats; 38,805 barrels of flour; 595 cases of eggs; 36,425 boxes of cheese; 543 pkgs. of butter; 17,192 barrels of apples, and 51,997 tons of coal, while 64,429 tons of coal were landed at various points on the canal banks. From the opening of navigation to Oct. 31 5,399 vessels passed through the canal against 5,080 during the same period in 1911.

The new Quebec harbor commissioners have entered on their duties, but it will take some time before they can familiarize themselves with the works, wants, etc., of the harbor. The season being so advanced they will, for the present, study the position and call in engineers with a view of having plans prepared for the development of the harbor. The commissioners will endeavor to have the plans sufficiently advanced to be able to commence the most necessary works at latest by next spring.

A. R. Decarry, District Engineer Department of Public Works, Quebec, informed the city board of trade, Nov. 12, of the Government plans for the development of the St. Charles river. It is proposed to build four piers extending northeasterly from the north walls of the Louise docks, to run parallel with the present breakwater. These piers will each be 1,000 by 300 ft. A masonry extension of the Louise embankment will be built in the shape of a triangle to a point where it is proposed to build a dam across the river 2,217 ft. long. There will be two locks in the dam, one to be used for vessels seeking an entrance into the upper reaches of the river, and the other as an exit for shipping. A steel bridge will be built to carry steam and electric railway tracks, as well as for general traffic. The river will be dredged from its mouth to near the marine hospital, and a wall will be built along the north wall of the river.

Ontario and the Great Lakes.

During October 6,780,566 bush. of grain passed through the Welland canal, against 4,826,900 in Oct., 1911.

M. Henry, Deputy Superintendent, Welland Canal, Port Dalhousie, Ont., has been notified that his services will be dispensed with Dec. 31.

The dredge Little Lake has been taken to Lake Simcoe to clear out the berths for the new wharf at Orillia, Ont., which will be 200 by 22 ft.

A bylaw for the imposition and collection of tolls, etc., for the harbor at Meaford, Ont., has been approved by the Dominion Government.

The keel of a new steamboat for the Northern Navigation Co. has been laid by the Western Dry Dock and Shipbuilding Co., Port Arthur, Ont.

The new oil burning steamship Calgary, just out from Glasgow, Scotland, ran aground Nov. 3 in entering the harbor at Buffalo, N.Y., on her first trip.

Capt. A. McMaugh, a well known mariner on the Great Lakes, died at St. Catharines, Ont., Oct. 30, aged 74. He was father of Capt. Jas. McMaugh, Toronto.

It is reported that the Richelieu and Ontario Navigation Co. is arranging to establish a fruit market in Toronto, at the waterfront, east of Yonge street.

The Keystone Transportation Co.'s capital has been increased from $100,000 to $500,000 by supplemental letters patent under the Dominion Companies' Act.

The Northern Navigation Co. proposes to erect a storehouse and cold storage plant, a laundry, and to double the capacity of its warehouses at Point Edward, Ont.

During October there passed through the St. Lawrence canals vessels carrying 1,765,632 bushels of grain. Vessels carrying 8,228 tons of coal discharged at Kingston, Ont., during the same period.

An appropriation of $30,000 is reported to have been secured for the construction of a dry dock at Peterboro', Ont., on the Trent river canal. It is said that the dock will be built at once.

The Dominion Government steamboat Dollard was launched at Kingston, Ont., Oct. 24. She is to be used in the lighthouse and buoy service, and will be fitted with wireless telegraph.

The steamboat Rosedale, owned by the Inland Lines Co., Hamilton, Ont., went aground at Detour light, near Sault Ste. Marie, Ont., Nov. 11, during a gale, but was released with but slight damage.

The Keystone Transportation Co.'s new steamboat Keybell, built at Collingwood, Ont., is completing her first round trip. She is of the regular canal dimensions, with a dead weight capacity of 2,200 tons.

W. F. Herman, G.P.A., Cleveland and Buffalo Transit Co., is reported as stating that the company proposes to inaugurate a passenger service between Cleveland, Ohio, and Port Stanley, Ont., next season.

A contract has been arranged with the Great Lakes Dredging Co. for the operation of its icebreakers at Port Arthur and Fort William, Ont., in order to keep navigation there open as late as possible this season.

Nicholas Huff. Chief Marine Engineer, Detroit, Belle Isle and Windsor Ferry Co., who retired recently after 20 years' service with the company, was given a dinner by the President and presented with a travelling bag.

The Keystone Transportation Co.'s steamship Keystorm ran on the Scotch Island shoal, near Brockville, Ont., Oct. 26, and sank. She was valued at $125,000. Her cargo consisted of 2,400 tons of coal consigned to Montreal.

The Mayflower, a freight and passenger steamboat trading on the Madawaska river, between Barry's bay and Ottawa, ran on a rock and sank when three miles out from Barry's bay on the night of Nov. 12, with the loss of nine lives.

Representatives of the Toronto Harbor Commissioners laid before the Dominion Government, Nov. 6, plans for the development of the harbor. The details of the plans will be made public after their approval by the city council.

The Dominion Government steamship Estevan has successfully completed her trial trips at Collingwood, Ont., and has started for Victoria, B.C., via the Straits of Magellan. It is expected that she will reach her destination in January.

The International Waterways Commission is being asked by the United States Government for permission to carry out extensive improvements on the Livingstone channel on the Detroit river. The channel passes through both Canadian and U. S. waters.

The first Welland canal was opened for traffic Nov. 3, 1829. There were between Lake Erie and Lake Ontario 40 wooden locks, each 100 ft. long, 22 ft. wide, and 8 ft. deep. On the proposed new canal, the locks will be 900 ft. long, 32 ft. wide and 30 ft. deep.

The Toronto Ferry Co.'s annual meeting has been postponed for a month owing to the audit being incomplete. The Managing Director, L. Solman, is reported as stating that the earnings for the year will not be as great as last year, owing to the wet season.

The Hamilton Steamboat Co. has surrendered its charter to the Ontario Government, and has been dissolved. Its property was acquired some time ago by the Niagara Navigation Co., and afterwards transferred to the Richelieu and Ontario Navigation Co.

The Richelieu and Ontario Navigation Co. is reported to have acquired an extensive waterfront site at Fort William, Ont.

The Dominion Government has awarded the Windsor Dredging Co. a contract for dredging at Port Stanley, Ont., estimated to cost $17,000.

G. Charett, Windsor, Ont., had his license as a first class pilot suspended for 30 days from Nov. 5, for violation of certain navigation rules in connection with the collision between the steamboats Pine Lake and Fleetwood on Lake St. Clair, Oct. 21, in which the former was sunk.

The new Livingstone channel, which the U.S. government has completed through the Detroit river at a cost of $10,000,000, has been opened for traffic.
Beginning Nov. 10 all downbound steamboats started to use the new channel at night as well as by day. The old channel will be used exclusively by upbound vessels.

The Georgian Bay Elevator Co. has been incorporated under the Ontario Companies' Act with a capital of $100,000 and offices at Meaford, Ont., to build a transhipment elevator there. Following are the provisional directors:—G. W. Mason, F. C. Carter, C. G. French, W. A. McCarthy, W. H. Beatty, Toronto.

The steamboat S. and Y., owned by the Upper Ontario Steamboat Co., went ashore about four miles below Flat rapids on the Montreal river, Ont., Nov. 14, and sank.

The oil driven vessel Calgary left Kingston, Ont., on her first trip to the head of the lakes Nov. 12. She arrived at Kingston from the builder's yards in Great Britain Oct. 28.

The U.S. Lake Survey reports the levels of the great lakes in feet above tidewater for October as follows:—Superior, 602.59; Michigan and Huron, 580.50; Erie, 572.12; Ontario, 246.17. As compared with the average October levels for the past 10 years Superior was 0.19 ft. below; Michigan and Huron, 0.14 ft. below; Erie, 0.05 ft. below, and Ontario, 0.30 ft. above.

It was semi-officially announced at Detroit, Mich., Nov. 11, that the Wabash Rd. had purchased three of the car ferries formerly used by the Michigan Central Rd., between Detroit and Windsor, Ont., viz., the Transfer, Transport and Detroit. The price paid is said to be $200,000. Up to the present the Wabash trains have been carried across the river on the G.T.R. car ferries.

The Great Lakes Dredging Co. is having built by the Western Dry Dock and Ship Building Co., at Port Arthur, an ice breaking tug, of which the following are particulars:—Length over all, 125 ft.; length between perpendiculars. 114 ft.; beam. moulded, 28 ft.; depth, moulded, 16 ft.; one Scotch boiler 15 ft. 4½ ins. diameter by 11½ ft. long; triple expansion engine, diameter of cylinders 18, 30, 48 by 38 ins. stroke.

Ottawa reports state that the plans for the new Welland canal are practically completed. It will start from near Thorold, and will extend to Lake Ontario at McCollas cove, three miles from the present outlet at Port Dalhousie, a distance of eight miles. The present canal will be utilized from Port Colborne to Thorold, thus making the whole canal 28 miles long. It is hoped that construction will be started on the new canal in the summer of 1913.

W. N. Warburton, Manager of the London and Lake Erie Transportation, is reported as stating that the new steamboat service to be run in connection with the company's London-Port Stanley electric railway will be from Port Stanley, Ont., to Cleveland, Ohio; that a steamboat of the Cleveland and Buffalo line will make four round trips a week—that the service will be continued annually to Dec. 1, and that traffic arrangements will be made with other lines.

Press reports stated recently that the oil engines on the vessel Toiler, which is managed for a syndicate by James Richardson and Sons, Kingston, Ont., have proved so unsatisfactory that they are to be replaced by steam engines. We are advised that this report is without foundation, and that while the engines have not been operating satisfactorily, it is improbable that some remedy cannot be found for the troubles. The sister oil engined ship, the Calgary, has been most satisfactory in operation.

The steamboat Marshall, owned by the Central Canada Coal Co., Brockville, Ont., ran into the gates at lock 13 on the Welland canal, Nov. 1. Four of the gates were carried away, but the repairs were completed so as to permit traffic being resumed on the following day. The vessel was not damaged.

The steam barge Juneau, with barge in tow, from Point Anne to Toronto, got caught in the gale of Oct. 31. Cutting off the tow the Juneau ran into Cobourg, where she sank. The barge, Lock, got adrift, and springing a leak, sank near the Gull lighthouse. The crew reached Port Hope Nov. 1, after several hours' rough experience in an open boat.

Manitoba, Saskatchewan and Alberta.

The Dominion Government tug Sir Hector ran on a rock near the mouth of the Little Saskatchewan river, in Lake Winnipeg, Nov. 2, and sank in 18 ft. of water.

W. W. Fryer, who died at Selkirk, Man., Oct 31, had been engaged many years in navigating Lake Winnipeg. Starting with the Northwest Navigation Co. in 1882, he finally organized the Ewing-Fryer Fish Co.

It is reported from Grand Forks, N.D., that the Red River Transportation Co., which has passed under the control of W. A. Whitney, Superior, Wisc., will likely move its headquarters to Winnipeg, Man., for the opening of the navigation season of 1913.

Navigation is suspended for the season on the Red River and the steamboats of the various companies engaged in the trade have been tied up at their wharves. The managers report that the season has been a good one, despite the weather which affected the passenger traffic, and the accidents.

The St. Andrew's lock on the Red river, near Winnipeg, was closed for the season.

Oct. 25. The lock has been drained, and the Ball Construction Co. has restarted work building cement approaches. The approaches on the east side have been completed, and the foundation work on the west side is well advanced.

An Ottawa press dispatch says the Minister of Railways is planning to push construction in the harbor and on the terminals at Port Nelson, so that when the Hudson Bay Ry. is completed steamships will be able to take cargoes of grain. H. T. Hazen, M. Can. Soc. C.E., has been at Port Nelson all summer making surveys, taking soundings and making a complete investigation as to the feasibility of the port for terminals.

In connection with the press reports referred to in Canadian Railway and Marine World for November as to a projected ship canal from Portage la Prairie, Man., to Lake Winnipeg, it is further reported that a preliminary survey has been made by W. E. Hobbs, of Winnipeg. It is expected to have the surveys completed this year, so that everything will be ready to start construction in the spring. Nothing is said as to who is behind the project.

British Columbia and Pacific Coast Marine.

The C.P.R. s.s. Princess Patricia is undergoing a general overhaul at Victoria.

The last steamboats for the season on the Yukon river left Dawson, Oct. 22.

Capt. C. G. Stormgren, a well known Pacific coast shipmaster, died at Victoria, B.C., Nov. 9.

The C.P.R. steamship Princess Sophia is to have oil burning apparatus installed during the winter.

The Coquitlam Shipbuilding Co., Coquitlam, B.C., has laid the keel of its first vessel, a 175 ft. four masted schooner.

The traffic receipts of the North Vancouver Ferry Co. for October were $11,692, against $11,230 in Oct., 1911, and $6,974 in Oct., 1910.

The Victoria, B.C., tug Bute went ashore off Albert Head, near Victoria, Nov. 2, and sank. She was floated Nov. 5 and towed into port for repairs.

Tenders have been invited for the building on the Pacific coast of two 45 ft. gasoline launches for the Dominion fisheries protection service on the coast.

The steamboat Vidette left Dawson, Yukon, Nov. 3, but was stalled by the ice in the Indian river. The passengers returned to Dawson, 28 miles, by land.

The winter service from Victoria to the Lynn canal, B.C., provided by the C.P.R., started Nov. 2, and is a fortnightly one, the Princess May being on the run.

The beacons and buoys placed by the Dominion Government on Pacific coast waters, which are now painted red, are, it is said, to be painted white in future.

It was announced in Vancouver Nov. 11 that tenders would shortly be asked for the building of a dipper type dredge for use on the Pacific coast, at an estimated cost of $150,000.

Two additional steam trawlers are on their way from Grimsby, Eng., for the Canadian Fisheries and Cold Storage Co., at Prince Rupert, B.C. Two others have already reached Prince Rupert.

The Dominion Government has advanced Vancouver, B.C., from a port of entry to a first class port. Under the new regulations vessels will be able to secure clearance papers at any hour of the day or night.

The plans for the dock and harbor at Coquitlam, B.C., prepared by A. O. Powell provide for the laying out of district lots 343, 168 and 169 for railway and industrial purposes, with docks, wharves, etc., on the Coquitlam river.

The British Columbia Express Co.'s steamboat B-X ran aground on a bar on the Upper Fraser river between Fort George and Quesnel, B.C., recently. This is the second time she has been damaged on the same bar during this year.

The Vancouver-Tacoma Steamship Co. has been sold to Frank Waterhouse & Co., Seattle, Wash. The company owned one steamboat, the Morning Star, which although having some passenger accommodation, only carries freight.

During the six months ended Sept. 30, the number of vessels arriving at and departing from Victoria, coastwise, was 3,790. During October 316 vessels of 221,094 tons arrived in, and 334 vessels of 190,329 tons departed from the port.

The old paddle steamboat George E. Starr, built in 1879, and operated for years between Olympia, Seattle, Wash., and Victoria, B.C., has been sold to Frank Waterhouse Co., Seattle, Wash. She is to be dismantled and converted into a barge.

The Boscowitz Steamship Co.'s steamboat Vadso, ran aground at the entrance of Bayne sound, Oct. 15. She was floated Oct. 26, and beached in Deep bay, where temporary repairs were made, and she was then towed to Vancouver for repairs.

The owners of the Vancouver tug Nouaine are suing the Inland Navigation Co., of Seattle, Wash., to recover $37,000 damages for the sinking of the tug after a collision with that company's steamboat Iroquois off the Fraser river mouth, Oct. 22, 1911.

It is reported that the owners of Victoria sealing schooners propose to place them under the German flag in consequence of the signing of the convention between Great Britain and the United States prohibiting pelagic sealing in the Pacific ocean for 15 years.

The contract for the building of the breakwater at Ogden point, Victoria, B.C., has been let to the London, Eng., firm headed by Sir John Jackson, at an estimated cost of $1,800,000. The structure will be 2,500 ft. long, and will extend into a depth of 80 ft.

The Terminal Steamship Co., controlled by Capt. Cotes, has added to its fleet the twin screw oil burner Rowena. This is the old Rowena, remodelled and refitted at a cost of $35,000. She will be put on the Vancouver-Howe sound run, in place of the present steamboats Bramba and Britannia.

Canadian Notices to Mariners.

The Department of Marine has issued the following:—

48. Nov. 9. 281. Nova Scotia, Cape Breton island, Washabaek river, buoy established. 282. Quebec, River St. Lawrence, ship channel between Quebec and Montreal, change in characteristic of lights shown from gas buoys on starboard side.

49. Nov. 14. 287. Nova Scotia, south coast, westward of Halibut islands, Salamander rock, buoy established. 288. Prince Edward Island, north coast, North Rustico, change in position of outer range lights. 289. Quebec, River St. Lawrence, port of Quebec, Maheux road, limits of examination anchorage.

92. Oct. 22. 257. Nova Scotia, south coast, off entrance to Lockport harbor, Gull rock, change in characteristic of light. 258. Newfoundland, east coast, St. Johns harbor entrance, existence of a rock; amended position of White rock. 259. Newfoundland, east coast, Bonavista bay, Shoepoint, lighthouse established. 260. Newfoundland, east coast, Bonavista bay, Puffin island, change in character of light.

93. Oct. 24. 261. Ontario, Georgian bay, approach to Victoria harbor, Midland point range lights established. 262. Ontario, Lake Superior, Thunder bay, Port Arthur, light on Thunder bay elevator wharf, additional information.

94. Oct. 24. 263. British Columbia, Vancouver island, west coast, shelter sheds established. 264. British Columbia, Burrard inlet, Vancouver harbor, Burnaby shoal, characteristic of fog bell. 265. British Columbia, Chatham sound, Prince Rupert harbor, Charles point, characteristic of fog bell. 266. United States of America, Washington, Juan de Fuca strait, Cape Flattery light station, intended change in fog signal.

95. Oct. 29. 266. Ontario, great lakes and River St. Lawrence, dates to which lights will be kept in operation.

96. Oct. 29. 267. Nova Scotia, south coast, entrance to Halifax harbor, Sambro outer bank, gas and whistling buoy to be replaced during winter by lightship. 268. Nova Scotia, North Atlantic ocean, Sable island, west end, change in character of light.

97. Oct. 31. 269. Ontario, Lake Ontario, Welland canal entrance, Port Dalhousie, operation of fog alarm temporarily discontinued.

98. Oct. 31. 270. Nova Scotia, southwest coast, Clarke harbor, buoy established. 271. Nova Scotia, Cape Breton island, east coast, Eastern harbor, Chetieamp, shoal in entrance, caution. 272. Quebec, River St. Lawrence, Cock point, can buoy replaced by gas buoy. 273. Labrador, uncharted shoal reported in the vicinity of Quaker reef and Tinker island. 274. England, south coast, Plymouth approaches, Draystone, light buoy established.

99. Nov. 5. 275. St. Lawrence river from Quebec to Lake Ontario, first edition of the St. Lawrence Pilot (above Quebec). 276. United States Lake Superior, Superior entry, north pierhead, light established, temporary light discontinued. 277. United States Lake Superior, Superior entry, north breakwater, light established, temporary light discontinued.

100. Nov. 7. British Columbia. 278. Vancouver island, west coast, Clayoquot sound, Templar channel, change in character of buoys. 279. Change in color of lighted beacons. 280. Queen Charlotte islands, Houston Stewart channel, beacon to be moved from Flat rock to Separation point, Tolmie channel.

102. Nov. 13. 283. Quebec, Ottawa river, Rigaud river entrance, range lights now shown from lanterns on poles. 284. Ontario, Ottawa river, Ile Rosalie, lighthouse established. 285. Ontario, Lake Huron, north channel, approach to Blind river, uncharted rock reported. 286. Ontario, Michigan, Detroit river, Livingstone channel, lighted buoy established, buoys provided with lights.

104. Nov. 15. 290. British Columbia, strait of Georgia, sandheads of Fraser river, diaphone fog alarm established on lightship, fog bell discontinued. 291. Alaska, Sumner strait, Vichnefski rock, light established.

105. Nov. 18. 292. New Brunswick, Bay of Fundy, Machias seal island, change in character of light. 293. New Brunswick, south coast, Bay of Fundy, Passamaquoddy bay, Chamcook head, buoy established, Chamcook harbor, buoys established.

106. Nov. 19. 294. Ottawa river, Lake of Two Mountains, St. Placide upper range, new back range lighthouse. 295. Ontario, Georgian bay, Colpoy bay, Wiarton, change

in position of light. 296. Ontario, Georgian bay, east side, southeastward of Roberts island, Honey harbor, beacon erected. 297. Ontario, Georgian bay, east side, approach to Parry Sound, red rock characteristic of fog alarm.

Comprehensive Scheme for Toronto Harbor Improvements.

The Toronto Harbor Commissioners have approved of a comprehensive scheme for the improvement of Toronto harbor, which was prepared by the commissioners' engineer, E. L. Cousins. The plans call for an expenditure of $19,142,088.91 within the next 10 years, it being apportioned as follows:

Commissioners' work, raised by debentures on property	$11,215,920.85
City's work (essential only)	146,500.00
Government work	6,123,284.66
Total	$17,485,705.51
Further city payment if council accepts park and boulevard scheme	1,656,383.40
Grand total	$19,142,088.91

The plans have been submitted to the Dominion government, and it is expected that some provision will be made in the estimates at the current session, so that work may be started next spring.

The commissioners have submitted the following summary of the scheme:

A modern harbor, with a uniform depth of water capable of accommodating any vessel with a draught of 24 ft.

Modern, permanent docks on the central waterfront served by 24 ft. of water, and equipped with the best of freight sheds, warehouses, and appliances.

A dock and industrial district at the foot of Cherry street, equipped with freight sheds, warehouses, and the first of a series of factory buildings to serve the needs of the east end.

A similar area at the foot of Bathurst street, to take care of west end business.

Proper co-ordination of rail and water traffic at all three of the above points, in order to properly develop the port.

An industrial area containing 644 acres of available land in the Ashbridge bay district, which will be known as the Toronto harbor industrial district, capable of accommodating factory buildings with a value of $30,000,000, and producing a ground rent revenue of $500,000 a year.

A ship channel, 6,800 ft. long, 400 ft. wide, and 24 ft. deep, with turning basin 1,000 ft. square at its east end, serving the industrial district and the eastern portion of the city generally, and equipped with three miles of dockage.

A dock area on the west face of the industrial district capable of development, so as to provide an additional dock frontage of 2½ miles.

A new lakefront park and waterway, extending from the eastern channel to the foot of Woodbine avenue, and containing 352 acres protected by a breakwater three miles long. Inside the breakwater will be ample accommodation for east end aquatic clubs.

A protected waterway, with an average width of 600 ft., behind a breakwater from Woodbine avenue to the east city limits.

Additional park areas on the Island totaling 352 acres. New park areas in the district from Bathurst street to the Humber river containing 190 acres, and fronting on a protected waterway 500 ft. wide, which is separated from the lake by a breakwater.

A total area of new park lands of 894 acres.

A bathing beach 1 1-3 miles long, from Sunnyside to the Humber. A similar beach 4¼ miles long, from the eastern channel to Victoria park.

A lakefront boulevard system of driveways, bridle-paths, and walks across the waterfront for 11 miles.

A protected waterway 12 miles long, from east to west along the city front.

A terrace promenade 6,880 ft. long and 55 ft. wide, from Sunnyside to the Humber.

A double-deck combined traffic and recreation pier 300 by 20 ft. in front of the exhibition grounds.

A location for aquatic clubs 1,000 by 300 ft. north of the new western channel, with an anchorage basin of absolutely protected water covering 42 acres. A similar location at the foot of Roncesvalles avenue, 800 by 250 ft., fronting on the protected waterway formed by the western breakwater.

A public playground covering 3½ acres east of the foot of Roncesvalles avenue. A public square 600 by 500 ft. west of Roncesvalles avenue.

A reservation 80 ft. wide, from the Humber river to Sunnyside crossing as a right of way for radial lines.

A new Lake Shore road 66 ft. wide, to the south of the radial railway reservation.

Large Lake Passenger Steamboats.

The Detroit and Cleveland Navigation Co.'s steamboat City of Detroit III., which was put in service between Detroit, Mich., and Buffalo, N.Y., during the past summer, was claimed to be the largest vessel of its type on the great lakes, if not in the world. She is 470 ft. long overall, 455 ft. on the keel, 55 ft. beam of hull and 22 ft. deep. But she will be outclassed by a vessel which is being built for the Cleveland and Buffalo Transit Co. to run between Cleveland, Ohio, and Buffalo, and which will be 500 ft. long overall, 58 ft. beam, 96½ ft. wide over the guards, and have a displacement of 7,000 tons.

The hull of the C. & B. vessel is of steel, divided into 12 compartments by watertight bulkheads, and having a double bottom extending over the entire length. The doors in the bulkheads will be operated by hydraulic power, controlled from the engine room. There will be automatic sprinklers and an automatic fire alarm system, and the kitchen will be in a separate fireproof compartment. The vessel will have 500 staterooms, accommodating 1,500 passengers, and will have a total capacity for 6,000 passengers and 1,500 tons of freight. All rooms will be equipped with running filtered water, electric light and telephones; ventilation will be provided by fans delivering cooled air. The main saloon will be 400 ft. long, and the dining room will have a series of alcoves with bay windows so as to afford a good view from the tables.

As to the use of side wheels instead of screws for propulsion, the company states that the former system has been adopted as affording maximum comfort to passengers, although it is thought to cost more for construction and operation. The engine is of the three cylinder compound inclined type, having a high pressure cylinder 66 x 108 ins. and two low pressure cylinders 96 x 108 ins. It will drive feathering wheels 30 ft. diameter over the buckets. At 30 r.p.m. the engine will develop about 9,500 h.p. and give a speed of about 22 m.p.h. the boiler equipment will include six single end and three double end marine boilers, each 14 ft. diameter, and these will have 24 furnaces 56 in. diameter. They will be arranged in four batteries, each with its own smokestack, the height from grates to top of stack being about 80 ft. The bunkers will have capacity for 600 tons of coal. There will be three turbo generators, supplying current for fans, motors and over 5,000 lamps.

For convenience and safety in the handling of so large a vessel in the harbors, she will be provided with double rudders, one at each end.

The Port of New Westminster, B.C.

The following information has been sent by the New Westminster Progressive Association. The city is on the Fraser river, 18 miles from salt water:—

The harbor extends from the head of Douglas island, about 28 miles from Sandheads lightship, down the north arm to salt water, south to the international boundary and up the south arm to Douglas island again. The main deep-water channel, or south arm, is 28 miles long, and the north arm, for log towing and small vessels, 14 miles. There is a depth of 14 ft. at low water and 26 ft. high water at Sandheads. When the Dominion government's work at the Sandheads is finished the depths will be 25 ft. at low water and 37 ft. at high water. There is an average depth of 40 ft. along 1.7 miles of municipal waterfront. The tides are 12 ft. at the Sandheads and 5 ft. at New Westminster. The water is fresh and good for boilers. Marine growth dies and falls off in the river in 10 days or so.

The pilotage is $1 per foot of vessel's draught and 1c. per registered ton each way. Half charges if no pilot is employed. The harbor dues run from 50c. for vessels of 50 tons and under to $5 for vessels over 700 tons. There are no dock dues. The wharfage is 5c. a ton. Railways make no charge on freight delivered from or to their own trains. The berthage is $1 a day, where any charge at all is made. Towage is unnecessary except for sailing vessels, when the charge is a matter of bargain.

The wharves are as follows:—C.P. Railway, 340 ft. long; C.P. Navigation, 700 ft. long; B.C. Transport, 600 ft. long; B.C. Electric Ry., Great Northern Ry., Canadian Northern Ry. at Port Mann, 1,000 ft. long, and many other privately leased wharves.

The C.P.R., the Great Northern Ry., and the B.C. Electric Ry. parallel the waterfront and run right on to the wharves.

A Dominion government dredge is at work at Sandheads, and another on the north arm. The Dominion government contract for the first 6,900 ft. of three mile jetty will be completed by April 1, 1913, and will form part of the LeBaron scheme, which will give 25 ft. at low water from the Pitt river to the Gulf of Georgia. A municipal dredge will soon be at work improving the city water front by filling Front street and carrying the harbor line farther out to an unbroken quay over a mile long.

The Floating Dry Dock for Montreal.—The Duke of Connaught, the dry dock for Montreal, a description of which was given in Canadian Railway and Marine World for October, arrived in Montreal, Nov. 1. The dock was 60 days in making the trip from Barrow-in-Furness, Eng., being towed across the Atlantic by two tugs. The voyage was a very tempestuous one, the dock breaking away from the tugs five times. The average rate of progress during the trip to Sydney, N.S., was four miles an hour. After lying a week at Sydney, stormbound, the towing was resumed. Traffic was suspended in the river at Montreal, Oct. 31, to the afternoon of Nov. 1, in order to give the dock a free passage. The dock was formally opened Nov. 18 by the Duke of Connaught, after whom it was named.

The Richelieu and Ontario Navigation Co. has declared a quarterly dividend of 2%, payable Dec. 2, to shareholders of record of Nov. 30.

The Minister of Marine on the St. Lawrence Insurance Rates.

Following are extracts from a verbatim report of the speech of Hon. J. D. Hazen, Minister of Marine, at the Canadian Manufacturers Association's annual dinner in Ottawa recently:—

I see that you had before you for consideration a subject of very great importance to the people of Canada as a whole, of special importance to the shipping interests and to those bringing from across the seas goods and raw material for the purpose of selling them in Canada or manufacturing them into goods that will be sold in Canada. I notice that a resolution was brought before you and after some amendment was passed with regard to the rates of insurance that are being paid upon the St. Lawrence route. I don't think I am overstating the case when I say it is the conviction of all who have studied trade conditions so far as they relate to the shipping interests of this country, that Canada is discriminated against by the underwriters so far as the rates of marine insurance upon the St. Lawrence, and in fact in the whole of British North America are concerned. Lloyd's insurance rates on single screw vessels plying to United States ports are from 10 to 11 cents on $100, and for the same type of steamer using the St. Lawrence route it is 15 cents. On double screw steamboats plying to U.S. ports the rate is 15 cents, and for the same type of vessel on the St. Lawrence route 22½ to 25 cents. It will be admitted, I think, on all sides that that is a very serious handicap to Canadian shipping and to the importers of goods from the British Isles; but there is worse than that, for commencing on Sept. 1 Lloyd's raised the rate on tramp steamers using the St. Lawrence 1% on the cost of the vessel, and for the month of October 2% on the cost of the vessel, the result is a rate is imposed upon tramp steamers coming to the St. Lawrence that is practically prohibitive, and that vessels of that class are kept away from the St. Lawrence, and in the fall an impossible state of affairs occurs, and it is impossible to move from the St. Lawrence the amount of grain that is coming there for shipment or that would come there for shipment if steamers of the tramp class could be got to come to Montreal for the purpose of carrying that grain away. That constitutes a tremendous handicap upon the Canadian trade, it gives that enormous advantage to U.S. ports, and the result of that is that thousands upon thousands of tons of grain that in the natural course of events ought to be shipped out of the St. Lawrence in ships sailing to Montreal or Quebec, are carried down to U.S. ports and shipped on vessels sailing to U.S. ports and the business given to those U.S. ports, and the advantage of that trade is lost to the Dominion. That is a state of affairs that cannot be regarded complaisantly by people endeavoring to build up on this northern part of the continent a great commercial country, that ought to be able to handle through its own ports the produets of its own fields and prairies.

The resolution finally adopted at the meeting of the Manufacturers' Association to-day asks the government to cause representations to be made to those who are engaged in underwriting risks upon vessels sailing between Great Britain and Canada, and if those representations are not availing, then asking the government to assist in the carrying out of some plan of insurance that will enable vessels engaged in the Canadian trade to get insurance rates on terms that were more equitable and fair, and that were more in proportion to the rates imposed upon vessels sailing to U.S. ports. Representation of the character asked have already been made to the underwriters and to Lloyd's in Great Britain. Representations have been made in the past, representations were made during the past summer when a number of the Canadian ministers were in London. Facts and figures have been laid before the underwriters; it has been pointed out that during late years great improvements have been made in the St. Lawrence route; that not many years ago the depth of water in the channel from Montreal down in places did not exceed 10 ft.; to-day from Montreal to the sea we have a channel 30 ft. deep, a channel that is being widened, straightened out and improved every year, and which is now being deepened to 35 ft.; it was pointed out that of late years aids to navigation of the most modern character it is possible to obtain, have been placed along the St. Lawrence; that there is a lighthouse practically on every headland, that on every promontory and point there is something to guide the mariner, and that the channel is well buoyed, and in addition to that submarine bells have been established, and that the most modern and up to date aids to navigation have been established along the St. Lawrence route, and that the government is willing to go on spending money, putting better aids on as the inventive genius of man produces aids that are better than those we have to-day; and there has been an improvement of a very great character indeed in the aids to navigation upon the St. Lawrence, and to-day there is no waterway in the world that is better guarded better protected, better buoyed or lighted than is the St. Lawrence from Montreal to the sea. It has been pointed out to the underwriters that the reductions in insurance rates have not been at all commensurate with the improved conditions that have been brought to pass on the St. Lawrence river, and that today the rates being charged to Canadian ports are out of all reason and all proportion to the rates that are being charged to the U.S. Although all these facts have been laid before the underwriters I regret very much to have to say that I cannot give any reason to hope that the underwriters are prepared to make any reduction in the rates at present time so far as the St. Lawrence route or the ports of Halifax and St John are concerned. Therefore, I think there is little to be gained or to be hoped for from any further representations that will be made to the underwriters.

The second part of the resolution asks the government to assist in a scheme that may be evolved for the purpose of causing a reduction of those rates, or, as I understand it, of having some scheme of insurance evolved under which owners of vessels coming to Montreal and the St. Lawrence and St. John and Halifax may get their ships insured at a rate that is fairly in reason compared with the rates to vessels going to the U.S. Up to the present no proposition of a feasible character seems to have been made to any government in Canada with regard to the establishment of a Canadian Lloyd's or a marine insurance to be assisted by the government. I read the resolution passed this forenoon not to mean that they expect the government of Canada to undertake the work of insuring ships coming to the St. Lawrence, hut as a request on their part that they would be willing to co-operate with vessel owners and others interested in this trade for the purpose of bringing to pass a better condition of affairs than exists today. I have no right to state, without consulting with my colleagues, what the policy of the government may be in that respect, but I think the practical course to take would be for the shipping interests on the St. Lawrence and for those who are interested in the importation of goods, to formulate some scheme of bringing about a better condition as regards insurance rates, with government aid, and to submit that proposition for the consideration of the government of Canada, and I don't think that the Premier would haul me over the coals at all for making the statement that I believe if they do so their appeal will not fall on unsympathetic ears, and that the government, having regard to the great industrial and commercial interests of this country, will be prepared to assist in a generous manner anything that may be suggested that will bring about what is so much desired by the shipping interests, and which will do so much to build up trade in Montreal and in the ports of the lower provinces as well.—Industrial Canada.

Port Colborne-Dundurn Collision.

The investigation into the collision between the s.s. Port Colborne and the s.s. Dundurn, while going through the draw of St. Dominique bridge in the Soulanges canal, on Sep. 9, whereby damage was done to a bridge and to the Dundurn, was held by Commander H. St. G. Lindsay, Dominion Wreck Commissioner, assisted by Captains F. Nash and J. McGrath, as assessors. Following is the decision:—

The Port Colborne is a vessel whose size is almost the limit which can navigate the canal. She therefore requires the deepest water, viz., the centre of the canal to navigate in. She was proceeding up the canal and, when within a short distance of the bridge, sighted the Dundurn, which was coming down, and almost at the same time answered the signal made by the Dundurn, of one blast on the whistle, meaning that he was going to pass to port in the usual manner. The Port Colborne was proceeding at about three knots when this signal was made, and expected to pass the draw of the bridge before the other vessel (the Port Colborne having the right of way). As the Port Colborne entered the draw of the bridge her master noticed that the Dundurn was steering in an erratic manner, and coming with considerable speed she struck the Port Colborne with her bow, and the impact of this threw the Dundurn's head towards the bridge, which was open and lying parallel with the south side of the canal, causing her to run into the bridge, damaging both the bridge and herself. The evidence of the Dundurn's master and crew showed that when the Port Colborne's lights were sighted, and the one blast signal was given, the master was unaware of the close proximity of the bridge, owing to the regular bridge lights not being exhibited, and he having allowed his vessel to get too close to the bank increased her speed so as to enable her to answer her helm quickly, and after getting his vessel straightened up and headed for the Port Colborne he noticed that that vessel was sheering slightly towards the south bank, thereby giving him a very small space to pass, and with the idea of avoiding a collision he gave the order for full speed ahead, hoping that he would be able to clear the Port Colborne and avoid running into the bank. At this time he first noticed the bridge, but the speed of his vessel was such that he could not then with safety have reversed his engines and stopped his ship, and the two vessels came together. Just before the impact the captain of the Dundurn reversed his engines and put his helm hard aport, the fact of the engines going astern and the helm hard aport increased

the swing to such an extent that his vessel struck the swing span of the bridge, knocking it off its pivot.

Had the Port Colborne, on sighting the Dundurn and answering her one blast signal, made the signal of three blasts which the court is informed is customary in such cases in the canal, and to be a request to the other vessel to check her speed, the accident might possibly have been prevented. The court is also of opinion that if the regular bridge signal lights had been exhibited, the Dundurn would never have attempted to pass the other ship in the draw. The captain of the Dundurn committed an error of judgment in still reversing his engines after the collision with the Port Colborne, as that order when carried out tending to increase the swing of the ship's head towards the bridge. The ordinary lights at St. Dominique bridge are a red and green light on the bridge itself and a white arc light on a pole at the south approach. On the night in question these lights were out of repair and in place of them the bridge tender had placed one ordinary oil lantern, showing a white light on the east side of the bridge and another similar lantern on the bank at the south approach to the bridge. The court therefore finds that the Dundurn was to blame for the accident and censures her master, and is of opinion that the lights used on the bridge to replace the regular lights which were out of order also contributed to the accident, and suggests that this matter be drawn to the attention of the Department of Railways and Canals.

C.P.R. Transfer Barge for Pacific Coast Service.

The C.P.R. has let a contract for building a car ferry barge, to be known as Transfer Barge no. 4. to handle traffic between Vancouver and Ladysmith, the company's point of connection with the Esquimalt and Nanaimo Ry., on Vancouver Island. She has been designed to carry 15 loaded 40 ft. freight cars.

The length overall will be 260 ft.; beam. 42 ft.; depth, 12 ft. She will be built similar in design to other barges already in the Pacific coast service, that is to say, she will have a moulded shipshape bow with a scow stern. The cars will be loaded and unloaded over the stern. The forward end will be divided off for the accommodation of the crew. She will be fitted with a steam boiler and windlass for the handling of anchors and the necessary pumps, etc. She is to be built by the British Columbia Marine Ry. Co., at Esquimalt, B.C., will be of steel throughout, and will be delivered in about eight months.

A araverse web frame will be placed in the way of longitudinal floors. There will be transverse watertight bulkheads, dividing the hull into six compartments. There will be two watertight bulkheads, to form fresh water tanks. The forepeak and two wing spaces in the after compartments will be fitted for water ballast. Instead of the usual bulwarks there will be trusses extending from aft to break of house. There will be three railway tracks. There will be heavy bumpers placed aft of break of house. There will be all deck fittings for securing apron, cars and barge, and all the necessary machinery for handling—such as boiler, windlass, capstan and pumps. There will be a short forecastle deck, arranged for housing machinery, coal bunkers, galley and crew's quarters, etc. The housework and pilot house will be constructed on the forecastle deck.

Investigation Into the Loss of the s.s. Keystorm.

Following is the finding of Commander H. St. G. Lindsay, Dominion Wreck Commissioner, who was assisted by Captains F. Nash, F. J. Thomson and J. McGrath, acting as assessors:—

The Keystorm, a vessel of 1,037 tons register, belonging to the Keystorm Transportation Co., of Montreal, engaged regularly in the coal trade between various coal ports in the United States and Montreal, left Charlotte, N.Y., on Oct. 25, about 3 p.m., for Montreal with a cargo of 2,273 tons of coal, and arrived off Tibbett point in the St. Lawrence about midnight. At 12.15 a.m., on Oct. 26, the master gave over the charge of the navigation to his first mate, with orders of a very indefinite nature as to what he should do, but, for some reason or other did not go below to his quarters, but remained on the forward deck, evidently not being quite satisfied of the first mate's ability to run the vessel in the intricate channel in that locality, and also being doubtful as to the state of the weather, which was at that time unsettled. At 3 a.m., the ship being off Alexandria bay, the master retired to his bed, the weather conditions, according to his evidence, being the same, but he did not take off his clothes, evidently expecting a call. From that point the vessel proceeded safely up to Sister's island light, which was a perfectly straight course from Sunken Rock light. When passing the Sister's she ran into a bank of fog, which obscured all lights and land marks. The first mate then showed a total disregard of prudence, or common sense, and not knowing what course the vessel should steer by compass, never having, as he said, paid any attention to such a method of navigation, he tried to take the customary course by using what he supposed was the glimmer of the light on Sister's island over the stern, but without being able to see the gas buoy on Chippewa point shoal, which under ordinary circumstances would have shown on the starboard bow, and then being doubtful of the ship's position, and without any reduction of speed, sent down to call the master, but before this could be done the ship struck on the Outer Scow shoal and became a total loss.

The court finds that the master, Louis Daigneault, showed a lack of judgment in allowing the mate to take charge of the navigation of this valuable vessel in this particular locality, where the greatest amount of care is necessary for navigation even during the day time, knowing as he did the limited experience the mate had in this work, and his going below at 3 a.m. was an act of culpable negligence, as there were still dangers to avoid, and in less than two hours' time it would have been daylight. The court therefore suspends his certificate from Nov. 1, 1912, to Nov. 1, 1913. With respect to the conduct of John Leboeuf, the mate, the court is of opinion that his neglect to call the master when the weather became thick, his lack of initiative in not stopping the engines when he lost his bearing, and his utter disregard of the compass course to be steered was gross and culpable negligence, and suspends his certificate from Nov. 1, 1912, to Nov. 1, 1914.

The court severely reprobates the very loose method of navigation which seems to be customary on vessels of this class, and particularly the want of compass courses, and suggests a printed card of all courses and distances on the various runs, the card to be hung up in the pilot house, ready for instant reference in case the leading lights or marks become obscured, as happened in this case.

The court is of opinion that everything was done in the engine room with regard to the pumping arrangements, but in spite of this the water gradually gained and ultimately caused the vessel to slip off the shoal into deep water and founder about five hours after stranding. No attempt seems to have been made to try and get the vessel off the shoal, and it is the court's opinion that under the circumstances it was just as well that such was the case.

Running Down of Fishing Boat by s.s. Canada.

Commander H. St. G. Lindsay, Dominion Wreck Commissioner, assisted by Capt. F. Nash, of Montreal, and Capt. C. Powell, of Campbellton, N.B., held an investigation at Campbellton recently into the collision between the s.s. Canada, belonging to the Campbellton and Gaspe Steamship Co., and a fishing boat of Grand River, Que., on Aug. 9, whereby the fishing boat sank and one man was drowned.

The court on considering the evidence of the master and crew of the Canada (that of F. Thibaudeau, the other member of the crew of the fishing boat who was saved not being obtained owing to his refusal to attend the court at Campbellton) finds that the Canada was navigated with proper and seamanlike care after leaving Grand River, and that the cause of the accident was due to the fact that no lights, fog signal or lookout were in evidence on the fishing boat at the time, although the weather was dark and hazy; therefore, the court does not consider that any blame for the accident should be attributed to A. Belanger, master of the Canada. The court is of opinion that for the greater safety of both coasting steamboats and fishing boats on the coast, that more attention should be given by fishermen to article 9 of the International Rules of the Road regarding lights and fog horn signals for fishing boats, and that a proper lookout should be kept while lying at anchor, or at their nets, for had such been the case on the morning of Aug. 9 this un-

Dominion Expenditures on Canals, Harbors Etc.

The public accounts for the year ended Mar. 31 show that in addition to the consolidated fund expenditures there was expended on Canadian canal systems on capital account $2,560,938.11, of which $1,746,095.48 was on account of the Trent valley canal. There was also expended on capital account the following sums on harbor and river works:—

Port Arthur and Fort William harbors	$996,120.02
Quebec harbor	510,818.45
River St. Lawrence ship channel	1,167,462.56
Red river improvements, Man.	50,939.49
St. John, N.B., harbor improvements	579,059.21
Tiffin, Ont., harbor	105,525.65
Victoria, Ont., harbor	149,983.76
Bare Point breakwater	19,335.70
Total	$3,579,244.84

Advances of $3,050,000 have been made to the Montreal Harbor Commissioners under statutory powers.

The total revenues from the canal systems were $263,716.75 against $221,-138.49 in 1910-11.

W. P. ANDERSON, Chief Engineer of the Marine Department, Ottawa, has been appointed to represent Canada at the River and Harbor Congress to be held in Washington, D.C., in December.

Telegraph, Telephone and Cable Matters.

The Canadian Northern Telegraph Co. has opened offices at Conquest and McGee, Sask.

The Canadian Northern Telegraph Co. has opened offices at Norquay, Steven, Delmas and Harwell, Sask., and Drumeller, Alta.

In the general balance sheet of the Dominion for the year ended Mar. 31, the government land and cable telegraph lines are valued at $348,320.77.

The G.N.W. Telegraph Co. has reopened its office at Richmond, Que., and has closed its officers at Anson and Beamsville, Ont., and Abenakis Springs hotel, Que.

J. B. Rogers, for many years wire chief in the Great Northwestern Telegraph Co.'s Toronto office, has been appointed chief operator, vice C. E. McManus, resigned on account of ill-health.

The new wireless telegraph station at Alert Bay, B.C., the tenth of the stations being erected on the British Columbia coast, is expected to be ready for operation early in December.

The Western Union Telegraph Co. commenced on Nov. 1 to operate all former Great Northwestern offices in New York state except Bombay, and Fort Covington, which will still stand as G.N.W. offices.

B. Oldham, wireless operator on the Northern Navigation Co.'s steamboat Huronic, was recently ordered to pay the costs in a case in which he was charged with deserting his ship at Sarnia, Ont., Oct. 21.

The Western Union Telegraph Co. has removed its office in Victoria, B.C., from the corner of Government and Bastion streets to 614 View street, where every provision has been made for its increasing business.

The cable ships Mackay-Bennett and Colonia are at their wharves in Halifax, N.S., transferring cable preparatory to starting out on further repair work. The Commercial Cable Co. has completed the erection of a new wharf for the use of these repair steamers.

The Canadian Northern Steamship Co.'s s.s. Royal Edward, on a recent inward trip signalled her position to the wireless station at Cape Race, Nfld., when 430 miles eastward of that place, which is said to be the longest distance over which communication has been established without a relay in the records of the Canadian signal service.

What is said to be the largest wireless station in the world is being completed and tested out at Arlington, Va. It is one of proposed system of government stations connecting all the strategic naval and military centres of the country. The Arlington plant, including towers, equipment and power station is estimated to have cost about $1,000,000.

The G.T.R. is gradually extending the telephone system of train despatching. As soon as the line can be completed it will be put in force from Montreal to Chicago on the main line. It is said that this system will be in use on the 15th district between Toronto and Sarnia tunnel about Jan. 1. During the course of the next few months the various despatchers will visit Allandale, Ont., and familiarize themselves with its operation.

Two new wireless telegraph stations have been completed on the upper lakes, viz.:—Midland and Tobermory, Ont., and a third is being completed at Sault Ste Marie, Ont. It is proposed to remodel the station at Port Arthur, Ont. These stations have a range of 300 miles each. Work has been started on a station at Point Edward, near Sarnia, Ont., and it is proposed to erect a series of stations through to Montreal. When the stations are fully equipped regulations will probably be put in force to compel all vessels to have wireless equipment.

The Dominion Government telegraph line from Ashcroft, B.C., to the Yukon territory is over 2,500 miles long. During the last operating year about 100,000 messages were despatched in each direction, the financial report showing a loss of $80,000. This is due to the excessive cost of maintenance owing to the severe weather, and the fact that repairmen are constantly patrolling the line. During the last operating year a branch line was built to Port Stewart, 175 miles, and a branch is being built from 150 Mile House on the Cariboo road to Bella Coola.

The Intercolonial Ry.'s Ocean Limited trains will be left on the route between Halifax and Montreal and Montreal and Halifax as daily trains, instead of being discontinued for the winter as heretofore, this being rendered necessary by increased traffic. The Maritime Express trains will also be continued, giving two through trains per day each way.

Among the Express Companies.

The Canadian Northern Ex. Co. has opened offices at Conquest and McGee, Sask.

The Canadian Northern Ex. Co. has opened offices at Norquay, Steven, Delmas and Harwell, Sask., and Drumeller, Alta.

The Canadian Northern Ex. Co.'s agency at Antar, Sask., has been transferred to South Moose Jaw, at end of steel on Moose Jaw subdivision. As there is at present no direct means of connection between that point and the city of Moose Jaw, all traffic for the latter point will, until further notice, continue to be routed via Regina for transfer to Dominion Ex. Co.

The Board of Railway Commissioners has defined the express delivery limits for Halifax, N.S., as follows:—the water front at northwesterly boundary from east end of Miller street, from south end of I.R.C. fence in Campbell road, to Duffus street, Longard road, Livingston street, Intercolonial cotton factory, Young, Oxford and North streets, Tobin's road (to Swain street), Beech street, Quinpool road, Oxford street, Cobourg road to northwest arm, including Oakland road, Wellington and Inglis streets, Tower and Bowery roads and Franklyn and Miller streets, to the harbor.

Canadian Express Company, Electric Truck.
(For description see Canadian Railway and Marine World, November, pg. 568.)

Internal Combustion Locomotives are, it is said, to be used on the construction of the Australian Transcontinental Ry. on account of the waterless desert country traversed by this new line to the west coast. These will be mainly small contractors' engines, such as have been used elsewhere, but it is suggested that the experience with them may assist in the development of larger ones of the same type to handle the traffic when the railway is in operation.

Railway Trespassers are responsible for a number of accidents and are a source of much trouble and expense to the companies, according to a survey of this matter just made by the Pennsylvania Rd. Last year 527 trespassers lost their lives on the Pennsylvania lines, where they were present in violation of the law. Their acts endangering the lives of the public and employes and giving difficulty to the railway were of such nature as breaking signal and switch lamps and placing obstructions on the tracks. Over $100,000 was spent by the company's police department during the year in efforts to overcome these troubles.

The United States Ex. Co. has issued the following statement:—"The directors have decided not to declare the semi-annual dividend usually paid in November. For the year ended June 30, gross revenue from operation increased $709,181. The increase of expense was $1,149,484, and net earnings for the year from all sources applicable to dividends was $233,228. In view of these results and the establishment of the parcels post and other problems now confronting the company and the uncertainty arising therefrom as to future earnings, the directors do not feel justified in declaring the dividend at this time." The company has paid dividends continuously since 1896. The annual rate of 6% was established in 1910.

The Wabash Rd. is said to have decided to proceed at an early date with the construction of new locomotive repair shops at Decatur, Ill.

Trade and Supply Notes.

The matter which appears under this head ng is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time we wish our readers to distinctly understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

W. B. SNOW, publicity engineer, Boston, Mass., has increased his staff by the addition of F. R. Lufkin, formerly of the instructing staff in electrical engineering of the Massachusetts Institute of Technology, and late Assistant Superintendent of Lighting and Wires of Brookline, Mass.

THE TITANIUM ALLOY MANUFACturing Co., owing to the rapidly increasing demand for its product, and the necessity for greater efficiency in consequence, has removed its general sales department to the works at Niagara Falls, N.Y., and has created a district office at Pittsburgh, Pa., where the usual effective work with the iron and steel trade will be continued. C. V. Slocum is General Sales Agent.

THE PRATT AND LETCHWORTH CO., Ltd., manufacturers of malleable iron castings, Brantford, Ont., has sold it plant, etc., to the Canadian Car and Foundry Co., Ltd., Montreal. The Brantford business, which has heretofore been owned by the Pratt and Letchworth Co., of Buffalo, N.Y., will, it is said, be carried on under its present local management and without change of name. The plant is to be enlarged.

THE COMMERCIAL ACETYLENE Railway Light and Signal Co., 80 Broadway, New York city, has been licensed by the Commercial Acetylene Co. under the letters patent covering dissolved acetylene, and has secured other important inventions in connection with railway and signal lighting. It has also purchased from the Commercial Acetylene Co. all the latter's charging and manufacturing plants.

M. BEATTY AND SONS, LTD., Welland, Ont., has issued a booklet, "Beatty Hoists," which contains full particulars of their steam and electric hoists, dredges, steel scows, drill boats, centrifugal pumps, clam shell buckets, derricks, derrick fittings, etc. Among the illustrations are views showing Beatty hoists in use at the erection of the C.P.R. Skugog river bridge, the C.P.R. Lethbridge viaduct, and the Algoma Central & Hudson Bay Ry. Montreal river bridge. A copy will be sent to anyone interested on application.

Transportation Conventions in 1912-1913

Dec. 11.—Association of Passenger Steamboat Lines, Washington, D.C.

Dec. 12-13.—Association of Transportation and Car Accounting Officers, Louisville, Ky.

Jan., 1913.—American Wood Preservers' Association, Chicago, Ill.

Mar. 18-20.—American Railway Engineering Association, Chicago, Ill.

May 6-9.—Air Brake Association, St. Louis, Mo.

May 20.—Association of Railway Telegraph Superintendents' Association, St. Louis, Mo.

May 26-29.—Master Boiler Makers' Association, Chicago, Ill.

The Michigan Central Rd. is building a 40 stall engine house at Bay City, Mich., and the new machine shops will be largely increased.

Railway and Allied Associations, Clubs, Etc.

The names of persons given below are those of the secretaries.

Canadian Car Service Bureau, J. E. Duval, 401 St. Nicholas Building, Montreal.

Canadian Freight Association (Eastern Lines), G. C. Ransom, Canadian Express Bldg., Montreal.

Canadian Freight Association (Western Lines), W. E. Campbell, 502 Canada Building, Winnipeg.

Canadian Railway Club, J. Powell, St. Lambert, Que. Meetings at Montreal 2nd Tuesday each month, 8.30 p.m., except June, July and August.

Canadian Society of Civil Engineers, C. H. McLeod, 413 Dorchester St. West, Montreal.

Canadian Street Railway Association, Acton Burrows, 70 Bond Street, Toronto.

Canadian Ticket Agents' Association, E. de la Hooke, London, Ont.

Central Railway and Engineering Club of Canada, C. L. Worth, 409 Union Station, Toronto. Meetings at Toronto 3rd Tuesday each month, except June, July and August.

Eastern Canadian Passenger Association, G. H. Webster, 54 Beaver Hall Hill, Montreal.

Engineers' Club of Montreal, R. W. H. Smith, 9 Beaver Hall Square, Montreal.

Engineers' Club of Toronto, R. B. Wolsey, 94 King St. West, Toronto.

Nova Scotia Society of Engineers, A. R. McCleave, Halifax, N.S.

Quebec Transportation Club, J. S. Blanchet, Quebec.

Western Canada Railway Club, W. H. Rosevear, 25½ Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.

The French state railway authorities have been conducting electrification experiments on a stretch of the Western Ry., and it is stated that results have been so satisfactory that it has been decided to go into the matter on a larger scale. Contracts for 100 electric locomotives have been placed with French and Belgian builders.

The Master Car and Locomotive Painters' Association of the United States and Canada held its annual convention at Denver, Col., recently. Reports on the maintenance of steel cars, vestibule end finish, car interior renovators, treatment and finish of passenger car concrete floors, care of steel passenger car roofs, etc., were discussed at length. T. J. Hutchinson, of the G.T.R., London, Ont., was elected Second Vice President for the current year. The place for the next convention, which has not yet been settled, will be either Ottawa, Detroit or Chattanooga.

WANTED

Car Estimator, familiar with both freight and passenger work of steel and wood construction. Apply, stating experience, age, and salary expected, to box 4484, Canadian Railway and Marine World.

WANTED

Bill of Material man, familiar with both freight and passenger work of steel and wood construction. Apply, stating experience, age, and salary expected, to box 4484, Canadian Railway and Marine World.

Briquetted Coal on Intercolonial Ry.—A press report from Amherst, N.S., stated recently that a new patent coal fuel had been put on the market and that a test had been made on the I.R.C. We are officially advised that some briquetted coal, made up egg shaped, about 4 ins. long, was used on the I.R.C. recently on a few trips. There is nothing new in this description of fuel, except its manufacture in Canada. It generally gives satisfactory results.

CANADIAN PACIFIC RAILWAY COMPANY

Issue of New Ordinary Capital Stock

Notice is hereby given that pursuant to Resolution passed at the Special General Meeting of Shareholders on 2nd October, 1912, an issue of $60,000,000, additional Ordinary Capital Stock of the Company, or 600,000 shares of $100 each, has been ordered by the Board of Directors.

The said Stock will be offered to the Ordinary Shareholders of record at 3 p.m. on Thursday the 2nd day of January, 1913, at the price of one hundred and seventy-five dollars per share, being at a premium of seventy-five per cent. over and above the par value thereof, on the basis of thirty per cent. or three shares in ten of their respective holdings.

The right to subscribe will expire at 3 p.m. on Thursday, 13th February, 1913.

Payments will be received at the Bank of Montreal, London, New York or Montreal, as follows:—

20% or $35 per share on subscription on or before 13th February, 1913.

20% or $35 per share on 14th April, 1913.

20% or $35 per share on 16th June, 1913.

20% or $35 per share on 18th August, 1913.

20% or $35 per share on 20th October, 1913.

Interest at the rate of 7% per annum will be paid in October, 1913, from the due date of each instalment to September 30th, 1913, on instalments up to and including that of the 18th August, 1913, which have been paid on or before due dates.

All shares of the issue on which instalments have been paid in full on the due dates will rank with the existing stock for the full dividend accruing for the quarter ending 31st December, 1913.

A circular containing the terms of subscription and payment and enclosing warrants of subscription will be mailed to the Shareholders on or about the 15th day of January, 1913.

By order of the Board.

W. R. BAKER,
Secretary.

Dated at Montreal, 18th November, 1912.

WANTED

1,000,000 RAILWAY TIES

The Central Railway Company of Canada invites tenders for supplying railway ties in lots of five to one hundred thousand, for delivery at Ste. Agathe, La Chute, Montreal and Grenville, in the Province of Quebec, and Hawkesbury, McAlpine, Ottawa, South Indian, Carleton Place, Bannockburn, Fenelon Falls, Orillia and Midland, in the Province of Ontario.

Tenders will be received until noon on Dec. 20, 1912.

For specifications and other particulars apply to

F. STUART WILLIAMSON,
Chief Engineer,
44 Beaver Hall Hill,
Montreal.

Canadian Northern Ontario Railway Company.

NOTICE is hereby given that the Canadian Northern Ontario Railway Company will apply to the Parliament of Canada, at its next session, for an Act extending the time wherein the company may construct:

(a) The lines of railway authorized by the Statutes of Canada for 1911, chapter 57, section 2, paragraph (a), items (i) to (iv), (vi), (ix) and (x), shortly described as follows:—

(i) Washago to Kincardine.

(ii) Arnprior to Gananoque.

(iii) Pembroke to Cobourg or Port Hope.

(iv) Frenchman's Bay, northwesterly to Owen Sound.

(vi) Niagara River to Goderich.

(ix) Hawkesbury to a point in the County of Leeds or Lanark.

(x) Parry Sound to North Bay.

(b) Also the line specified in paragraph (c) of the same section and chapter, namely:—

Berlin, through Guelph, Acton and Brampton to Toronto.

(c) Also the line of railway authorized by the Statutes of Canada for 1908, chapter 93, section 2, shortly described as follows:—

From between Udney and Rathburn to the Georgian Bay.

(d) Also to authorize the construction of the following lines of railway:—

(I) An extension of the line mentioned in paragraph (b) of this notice, southwesterly to Stratford and St. Mary's with a branch to Woodstock.

(II) Sarnia to Chatham.

(III) Orillia to Goderich via Owen Sound, or with a branch to Owen Sound.

GERARD RUEL,
Chief Solicitor.

Toronto, 30th October, 1912.

Canadian Northern Railway Company.

NOTICE is hereby given that the Canadian Railway Company will apply to the Parliament of Canada, at its next session, for an Act extending the time wherein the Company may construct the lines of railway authorized by the Statutes of Canada for 1908, chapter 92, section 2, paragraphs (a), (b), (c) and (h), shortly described as follows:—

(a) Humboldt to Calgary.

(b) Maryfield to Lethbridge.

(c) North Battleford to Athabasca Landing, with a branch to Green Lake.

(h) Neepawa, northwesterly to the South Saskatchewan River.

Also the line of railway which the Saskatchewan Midland Railway Company (amalgamated with the Company) was authorized to build by chapter 41 of the Statutes of Saskatchewan for the year 1909, section 7, paragraph (v), namely:—

Humboldt to Melfort.

Also to authorize the construction of the following line of railway:—

From a point at or near Swift Current, westerly to a point at or near the junction of the Company's authorized lines to MacLeod and Lethbridge.

Also to confirm and ratify an agreement between the Company and the Canadian Pacific Railway Company respecting the terminals at Regina.

Also to increase the bonding powers of the Company.

GERARD RUEL,
Chief Solicitor.

Toronto, 30th October, 1912.

Niagara, St. Catharines and Toronto Railway Company.

NOTICE is hereby given that the Niagara, St. Catharines and Toronto Railway Company will apply to the Parliament of Canada at its next session for an Act extending the time wherein the Company may construct the lines of railway authorized by the Statutes of Canada for 1906, chapter 132, section 1, paragraphs (b), (c) and (d), shortly described as follows:—

(b) Port Colborne to Fort Erie and Fort Erie to the City of Niagara Falls.

(c) From the City of Niagara Falls to the Town of Niagara, and from the Town of Niagara to the City of St. Catharines.

(d) From the Town of Welland to the City of Brantford.

Also the line of railway authorized by the Statutes of Canada for 1899, chapter 77, section 8, shortly described as follows:—

An extension of the line of the St. Catharines and Niagara Central Railway Company to a point on the Niagara River at or near Fort Erie, and an extension to the City of Toronto by way of the City of Hamilton or thereabouts.

GERARD RUEL,
Chief Solicitor.

Toronto, 30th October, 1912.

Canadian Northern Quebec Railway Company.

NOTICE is hereby given that the Canadian Northern Quebec Railway Company will apply to the Parliament of Canada at its next session for an Act:—

(a) Extending the time wherein the Company may construct the lines of railway authorized by the Statutes of Canada for 1911, chapter 58, section 2, namely:—

(a) Rawdon northerly to the National Transcontinental Railway, with a branch to Joliette.

(b) St. Jerome to St. Eustache.

(b) Also authorizing the construction of the following lines of railway:—

(i) From a point in the City of Montreal, crossing the St. Lawrence River opposite the City, and from thence to Levis.

(ii) From a point on the last mentioned line east of the St. Lawrence River to a point at or near St. Rosalie Junction, thence to a point at or near Sherbrooke or Lennoxville.

(c) Also defining and increasing the bonding powers of the Company.

GERARD RUEL,
Chief Solicitor.

Toronto, 30th October, 1912.

THE CANADIAN PACIFIC RAILWAY COMPANY.

DIVIDEND NOTICE

At a meeting of the Board of Directors held to-day, a dividend of two and one-half per cent. on the Common Stock for the quarter ended 30th September last, being at the rate of seven per cent. per annum from revenue and three per cent. per annum from interest on the proceeds of land sales and from other extraneous assets, was declared payable on 2nd January next to Shareholders of record at 3.00 p.m. on 2nd December next.

By order of the Board,
W. R. BAKER,
Secretary.

Montreal, November 11th, 1912.

Kootenay and Arrowhead Railway.

NOTICE—The Kootenay and Arrowhead Railway Company will apply to the Parliament of Canada at its next session for an Act extending the time within which it may construct the railway from Gerrard to Arrowhead, and authorizing an increase of its bonding powers, and for other purposes.

Dated at Montreal, this 23rd October, 1912.

H. C. OSWALD,
Secretary.

Pringle, Thompson & Burgess,
Ottawa agents.

Collingwood Southern Railway Company.

NOTICE—The Collingwood Southern Railway Company will apply to the Parliament of Canada, at its next session, for an Act extending the time within which it may construct the line of railway which it has been authorized to construct by section 8 of chapter 77 of the Statutes of Canada, 1907, and authorizing an increase of its bonding powers, and for other purposes.

Dated at Ottawa, this 23rd October, 1912.

ANDREW T. THOMPSON,
Solicitor for Applicants.

Attawa Northern and Western Railway.

NOTICE—The Ottawa Northern and Western Railway Company will apply to the Parliament of Canada, at its next session, for an Act extending the time within which it may construct the extension of its main line from Maniwaki to a point at or near James Bay and the extension to Lake Temiscamingue, authorizing an increase of its bonding power, and for other purposes.

Dated at Montreal, this 23rd October, 1912.

H. C. OSWALD,
Secretary.

Pringle, Thompson & Burgess,
Ottawa agents.

Shuswap and Okanagan Railway.

NOTICE—The Shuswap and Okanagan Railway Company will apply to the Parliament of Canada, at its next session, for an Act authorizing it to enter into an agreement with the Canadian Pacific Railway Company for any of the purposes specified in section 361 of "The Railway Act," and to lease its railway to the said company, and authorizing an increase of its bonding power, and for other purposes.

Dated at Montreal, this 23rd October, 1912.

A. R. CREELMAN,
Solicitor for applicant.

Pringle, Thompson & Burgess,
Ottawa agents.

NOTICE!

The Canadian Pacific Railway Company will apply to the Parliament of Canada at its next Session for an Act authorizing it to lay out, construct and operate a railway from a point on the company's Kleinburg-Sudbury Branch, between Bolton Junction and Palgrave, thence in a westerly direction through the Counties of Peel and Halton to a point on the Ontario and Quebec at or near Campbellville.

Dated at Montreal this First day of November, 1912.

W. R. BAKER,
Secretary.

Pringle, Thompson & Burgess,
Ottawa Agents.

British Columbia Southern Railway.

NOTICE—The British Columbia Southern Railway Company will apply to the Parliament of Canada, at its next session for an Act extending the time within which it may construct its railways to the 49th parallel and the Tobacco Plains, and from the main line at a point about 36 miles west of the Eastern Boundary of British Columbia, authorized by chapter 55 of the Statutes of 1899; the western section of its railway and the branches to Nelson and Martin Creek as described in section 1 of chapter 52 of the Statutes of 1900, and the branch from Michel to Kananaskis as described in section 1 of chapter 54 of the Statutes of 1909, and authorizing an increase of its bonding powers and for other purposes.

Dated at Montreal, this 23rd day of October, 1912.

H. C. OSWALD,
Secretary.

Pringle, Thompson & Burgess,
Ottawa agents.

Manitoba and Northwestern Railway.

NOTICE—The Manitoba and Northwestern Railway Company will apply to the Parliament of Canada at its next session for an Act extending the time within which it may construct the lines of railway from Yorkton to Prince Albert, from Russell to the Northern or Western boundary of Manitoba, from a point between Portage la Prairie and Arden to the boundary of Manitoba, from some point between Westbourne and Beautiful Plains northwesterly in the direction of Lake Dauphin or Duck Mountains, from a point between Theodore and Insinger to a point in Township 32, Range 18 or 19, west of the 2nd Meridian, and from Bradenbury to Kamsack, and authorizing an increase of its bonding powers, and for other purposes.

Dated at Montreal this 23rd October, 1912.

H. C. OSWALD,
Secretary.

Pringle, Thompson & Burgess,
Ottawa agents.

The Guelph and Goderich Railway Company.

THE Guelph and Goderich Railway Company will apply to the Parliament of Canada, at its next session, for an Act extending the time within which it may construct the branches which it has been authorized to construct by section 7 of chapter 81 of the Statutes of Canada, 1904, and authorizing an increase of its bonding powers, and for other purposes.

Dated at Montreal, this 23rd October, 1912.

H. C. OSWALD,
Secretary.

Pringle, Thompson & Burgess,
Ottawa agents.

Campbellford, Lake Ontario and Western Railway.

NOTICE—The Campbellford, Lake Ontario and Western Railway Company will apply to the Parliament of Canada, at its next session, for an Act authorizing an increase of its bonding powers, and for other purposes.

Dated at Montreal, this 23rd October, 1912.

H. C. OSWALD,
Secretary.

Pringle, Thompson & Burgess,
Ottawa agents.

Alberta Central Railway.

NOTICE—The Alberta Central Railway Company will apply to the Parliament of Canada, at its next session, for an Act extending the time within which it may construct the railway from a point in township 38, range 23, west 4th Meridian westerly to a point in or near Red Deer authorized by chapter 44 of the Statutes of 1901; the extension from a point in township 38, range 23, west 4th Meridian easterly to a point in township 39, range 11, west of the 4th Meridian authorized by chapter 75 of the Statutes of 1903; branches from westerly terminus near Rocky Mountain House to a point in or near the Yellowhead Pass, from easterly terminus near the elbow of the Battle River to a point at or near Saskatoon or Warman and from a point on main line east of Red Deer to a point at, in or near Moose Jaw authorized by chapter 39 of the Statutes of 1909; and the extension from Saskatoon to a point at or near Fort Churchill with a branch from some point on such extension at or near the Pas to a point at or near Port Nelson; extension from Moose Jaw to a point on International Boundary in township 1, range 16, west 2nd Meridian; railway from a point between Red River and Cygnet Lake to a point at or near Blackfalds thence to Lacombe; three branch lines, 30 miles each, from authorized line into Big Horn Range between North Saskatchewan and Brazeau Rivers; two branches, 25 miles each, through ranges 20, 21 and 22, townships 43, 44, 45 and 46, west of the 5th Meridian, and northeasterly from north end of Big Horn Range along Brazeau River thence to Pembina River authorized by chapter 30 of the Statutes of 1911, and authorizing an increase of its bonding powers, and for other purposes.

Dated at Montreal, this 23rd October, 1912.

H. C. OSWALD,
Secretary.

Pringle, Thompson & Burgess,
Ottawa agents.

Alberta Railway and Irrigation Company.

NOTICE—The Alberta Railway and Irrigation Company will apply to the Parliament of Canada, at its next session, for an Act extending the time within which it may construct the railways which it has been authorized to construct by chapter 79 of the Statutes of 1900, and by chapter 187 of the Statutes of 1903, namely from a point between Lethbridge and Stirling to a point on the International Boundary between ranges 24 and 30, west 4th Meridian; from Cardston to a point in range 1, west 5th Meridian; from a point at or near Cardston to a point at or near Pincher Creek, thence to a point between range 2, west 5th Meridian and range 27, west 4th Meridian; and from Stirling to a point in range 4, west 4th Meridian between the line of the Canadian Pacific Railway and the International Boundary, and authorizing an increase in its bonding powers, and for other purposes.

Dated at Montreal this 23rd day of October, 1912.

H. C. OSWALD,
Secretary.

Pringle, Thompson & Burgess,
Ottawa agents.

Canadian Pacific Railway.

NOTICE—The Canadian Pacific Railway Company will apply to the Parliament of Canada, at its next session, for an Act,

1. Authorizing the company to lay out, construct and operate the following lines of railway:—

(a) From a point at or near Snowflake on the Windygates subdivision and running in a westerly direction to a point in or near Section 14, Township 1, Range 11, west of the Principal Meridian, all in Manitoba, a distance of about 9 miles;

(b) From the present terminus of the Gimli branch at or near Gimli, in a northerly direction for about 60 miles through Range 3 or 4, to some point on or near the west shore of Lake Winnipeg, thence in a northwesterly direction to a point on the Little Saskatchewan River, all in the Province of Manitoba;

(c) From some point on the line of railway described in Sub-section "C" of Section 4 of "The Canadian Pacific Railway Act, 1911," situate not more than 50 miles east of Stirling to a point on the Alberta Railway and Irrigation Company's Railway at or near Stirling, all in the Province of Alberta;

(d) From a point at or near Cayley on the Macleod branch in a southerly and southwesterly direction to a point at or near Burmis on the Crow's Nest subdivision;

(e) From a point on the company's Kleinburg-Sudbury branch between Bolton Junction and Palgrave, thence in a westerly direction through the counties of Peel and Halton to a point on the Ontario and Quebec Railway at or near Campbellville;

(f) From a point on the company's railway south of Forsythe street in Hochelaga ward, Montreal, thence in a northerly direction through the counties of Hochelaga and L'Assomption to a connection with the company's railway at or near L'Epiphanie;

2. Extending the time within which the company may construct the following lines of railway:—

(a) From a point on the company's Crow's Nest branch in Section 12, Township 9, Range 26, west of the Fourth Meridian, thence westerly along the north side of the Old Man River to a point in Section 36, Townsbip 7, Range 4, west of tbe Fifth Meridian, all in the Province of Alberta;

(b) From a point at or near Tantallon, on its Pheasant Hills branch, to a point at or near Craven on its branch northerly from Regina, all in the Province of Saskatchewan;

(c) From a point at or near Dysart or Lipton in a southerly and southeasterly direction to a junction with the line described in paragraph 2 (b);

(d) From a point in Townships 32 to 34, Ranges 21 to 23, west of the Second Meridian in a northerly direction into the Town of Prince Albert, a distance of about 130 miles;

(e) From Stonewall or Teulon or a point between those two places or north of Teulon, thence in a direction generally northwest to a point on the east shore of Lake Manitoba between Marsh Point and the north boundary of Township 25.

And for other purposes.

Dated at Montreal, this First day of November, 1912.

W. R. BAKER,
Secretary.

Pringle, Thompson & Burgess,
Ottawa agents.

"The Bowser"

Has the Right-of-way

For twenty-eight years the Bowser has had the right-of-way in building oil storage systems. During that time they have devoted their entire attention to this problem, and as a result they are in position to assist you in this troublesome department

You systematically and accurately check out the coal you use, and night and day your track is watched by a thousand trained eyes. Yet, seven cases out of ten you pay little or no attention to what keeps your rolling stock in good condition—your oil.

We solicit your correspondence. Get our new book No. 18. It's free.

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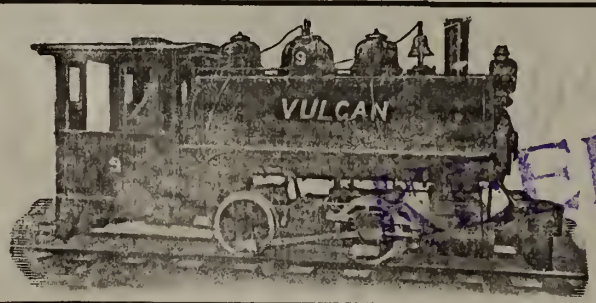

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Any person who is the sole head of a family, or any male over 18 years old, may homestead a quarter section of available Dominion land in Manitoba, Saskatchewan or Alberta. The applicant must appear in person at the Dominion Lands Agency or Sub-agency for the district. Entry by proxy may be made at any agency, on certain conditions by father, mother, son, daughter, brother or sister of intending homesteader.

Duties.—Six months' residence upon and cultivation of the land in each of three years. A homesteader may live within nine miles of his homestead on a farm of at least 80 acres solely owned and occupied by him or by his father, mother, son, daughter, brother or sister.

In certain districts a homesteader in good standing may pre-empt a quarter-section alongside his homestead. Price, $3.00 per acre.

Duties.—Must reside upon the homestead or pre-emption six months in each of six years from date of homestead entry (including the time required to earn homestead patent) and cultivate fifty acres extra.

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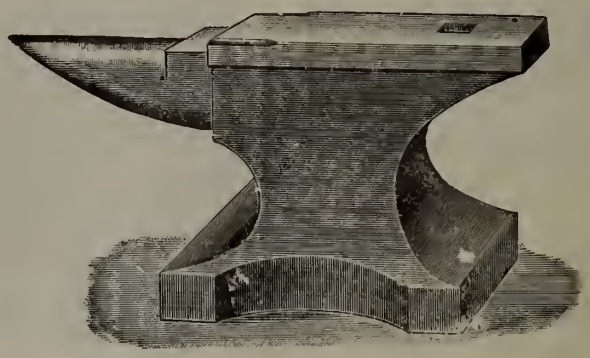

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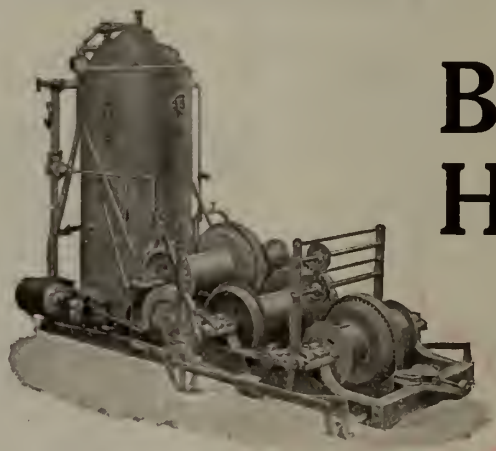

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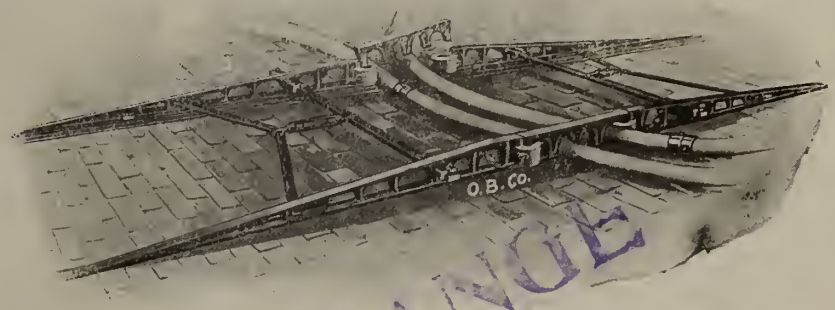

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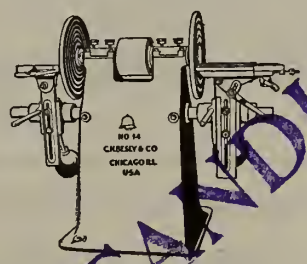

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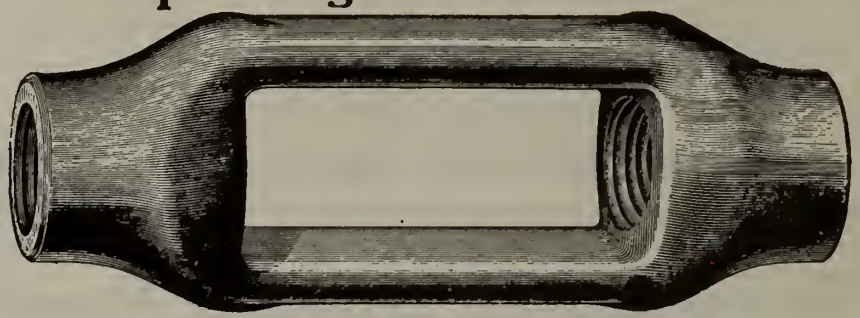

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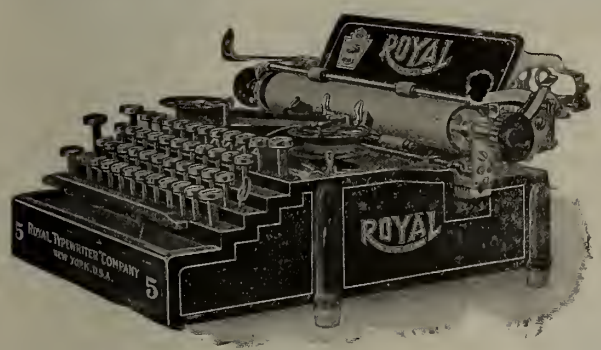

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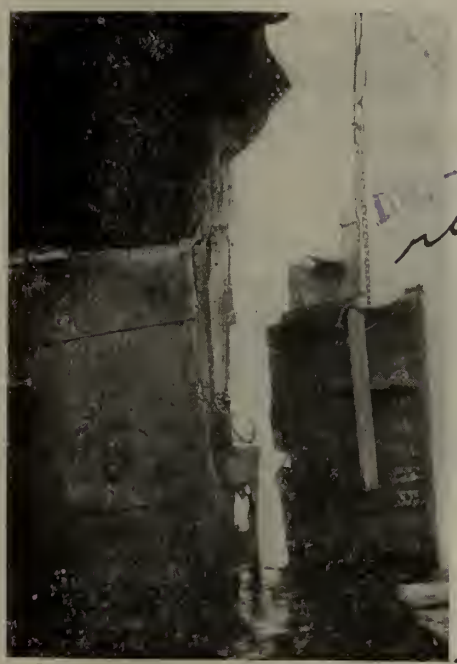

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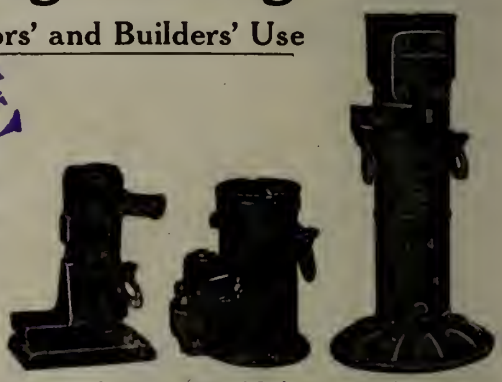

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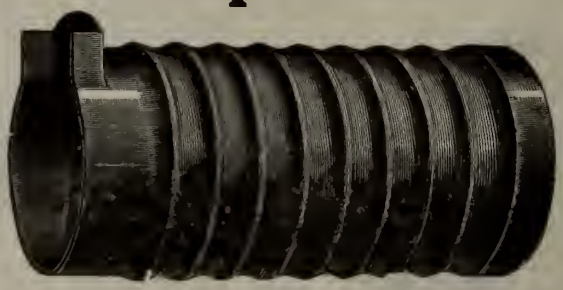

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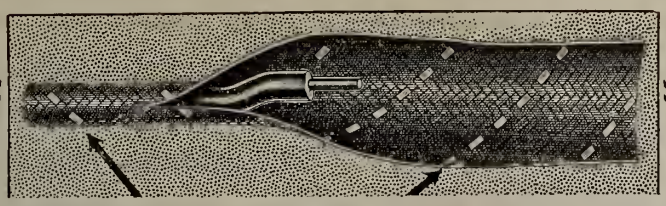

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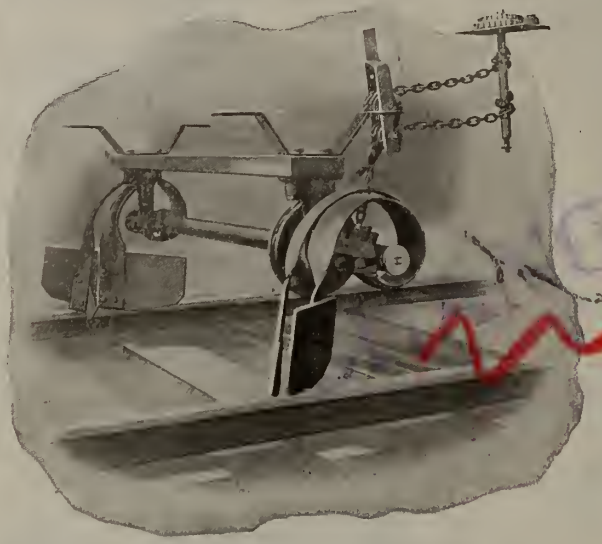

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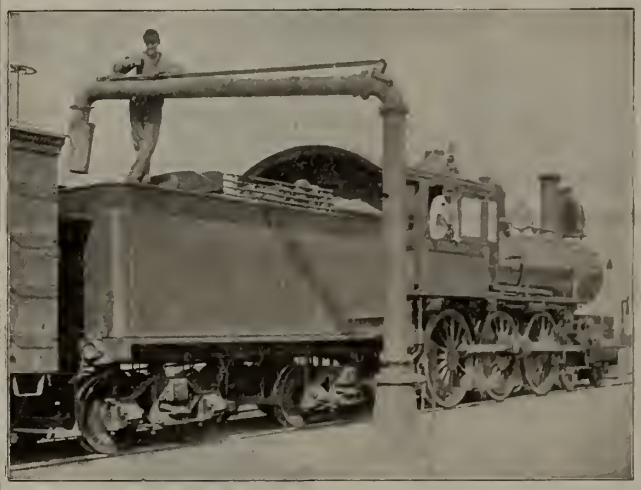

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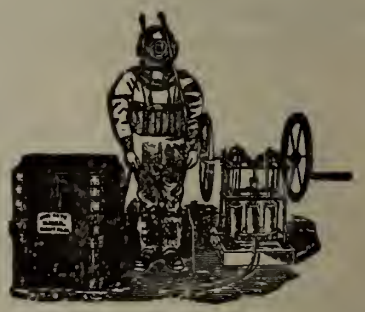

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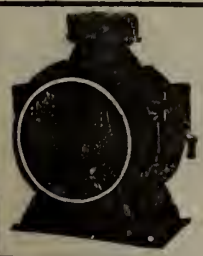

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MAIL CONTRACT

SEALED TENDERS addressed to the Postmaster General will be received at Ottawa until Noon, on Friday, the 13th December, 1912, for the conveyance of His Majesty's Mails on a proposed Contract for four years, six round trips per week, over Aurora Rural Mail Route from the Postmaster General's pleasure.

Printed notices, containing further information as to conditions of proposed Contract, may be seen and blank forms of Tender may be obtained at the Post Office of Aurora, Vandorf, Newmarket, White Rose, Gormley, Pleasantville, Bethesda, and at the Office of the Post Office Inspector at Toronto.

G. C. ANDERSON,
Superintendent.

POST OFFICE DEPARTMENT,
Mail Service Branch,
Ottawa, 30th October, 1912.

MAIL CONTRACT

SEALED TENDERS addressed to the Postmaster General, will be received at Ottawa until Noon, on

Friday, the 6th December, 1912,

for the conveyance of His Majesty's Mails on a proposed Contract for four years, six times per week, over Rural Mail Route from KING, ONTARIO, to commence at the pleasure of the Postmaster General.

Printed notices, containing further information as to conditions of proposed Contract, may be seen and blank forms of Tender may be obtained at the Post Office of King and at the office of the Post Office Inspector at Toronto.

G. C. ANDERSON,
Superintendent.

Post Office Department,
Mail Service Branch,
Ottawa, 21st October, 1912.

NAVAL SERVICE OF CANADA

Notice concerning Tenders for Metal Stores.

SEALED TENDERS addressed to the undersigned, endorsed "Tenders for ...." will be received up to noon December 3rd for the undermentioned descriptions of Metal Naval Stores.

Brass and Copper Sheets, bars and tubes. Zinc and Lead Sheets. Steel Plates, Sheets, Angles and Bars. Steel Wire rope. Solder Spelter and Tin. Babbit Metal, Copper and Steel nails, Steel Files.

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Forms of tender may be had by application to the undersigned, or to the Naval Store Officer at either Dockyard. Applicants for tender forms are requested to state clearly for which article or articles they wish to tender.

Unauthorized publication of this notice will not be paid for.

G. J. DESBARATS,
Deputy Minister of the Naval Service.
Department of the Naval Service,
—30564. Ottawa, November 1st, 1912.

NOTICE

The General Railway Signal Company, the owner of the exclusive rights in Canada in patents No. 92338, No. 81271, No. 96210, and No. 97758, issued to Axel Wenner-Gren, and covering methods of signalling electrified railways, wishes to call the attention of all possible users of the devices and systems covered by such patents, to the fact that it is prepared to sell and furnish, at short notice, all such devices and to install such systems upon any railway in the Dominion of Canada.

All inquiries regarding the above should be addressed to the office of the company, Room 506, Eastern Townships Bank, 263 St. James St., Montreal, Que.

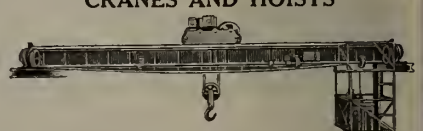
Canadian Northern Branch Lines Company.

NOTICE is hereby given that the Canadian Northern Branch Lines Company will apply to the Parliament of Canada at its next session for an Act extending the time wherein the Company may construct all the lines of railway authorized by the Statutes of Canada for 1911, chapter 56, section 8, excepting the first line.

GERARD RUEL.

Toronto, 30th October, 1912.

CRANES AND HOISTS



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Hangers, Cable
Standard Underground Cable Co....Hamilton
Hardware
The Hudson's Bay Co. .....
Rice Lewis & Son .....Toronto
Headlights
Commercial Acetylene Co. .....Toronto
Pyle-National Electric Headlight Co...Chicago
Safety Car Heating & Lighting Co...New York
Headlinings
Croaaen Car Co. .....Cobourg, Ont.
Heaters, Feedwater
Robb Engineering Co., Ltd.....Amherst, N.S.
Heating, Car
Canadian Gold Car Htg. & Ltg. Co...Montreal
Consolidated Car Htg. Co. ....Albany, N.Y.
Safety Car Heating & Lighting Co...New York
United States Light & Heat Co...New York
Heating Plants, Steam
F. H. Hopkins & Co. .....Montreal
National Boiler Washing Co. ..... Montreal
Heating, Roundhouse and Power House
F. H. Hopkins & Co. .....Montreal
National Boiler Washing Co. ..... Montreal
Hoists, Pneumatic
Taylor & Arnold .....Montreal
Hooks
Steel Co. of Canada, Ltd.....Hamilton, Ont.
Hoppers, Car, Wet or Dry
Duner Co. .....Chicago, Ill.
Hose, Air Brake and Steam
Safety Car Heating & Lighting Co...New York
Guilford S. Wood .....Chicago, Ill.
Hydrants
Canada Foundry Co., Ltd. .....Toronto
Canadian Fairbanks-Morse Co. ....Montreal
Kerr Engine Co. .....Walkerville, Ont.
Hydraulic Equipment
R. D. Wood & Co. .....Philadelphia, Pa.
Illustrations
Acton Burrows, Ltd. .....Toronto
Injectors
T. McAvity & Sons .....St. John, N.B.
Inspections
R. W. Hunt & Co. .....Montreal
Insulators, Porcelain
Canadian General Electric Co., Ltd...Toronto
Ohio Brass Co. .....Mansfield, Ohio
Insurance, Accident
Canadian Railway Accident Ins. Co...Ottawa
Imperial Guarantee & Acc. Ins. Co...Toronto
Interlocking Plant and Signals
Canadian Steel Foundries, Ltd. ....Montreal
Railway Signal Co. of Canada, Ltd...Montreal
Saxby & Farmer, Ltd. .....Montreal
Iron and Steel Bars
Steel Co. of Canada, Ltd.....Hamilton, Ont.
Iron, Pig
Nova Scotia Steel and Coal Co...New Glasgow
Steel Co. of Canada, Ltd.....Hamilton, Ont.
Iron Signs
Acton Burrows, Ltd. .....Toronto
Jacks
Canada Lifting Jack Co....Sherbrooke, Que.
Canadian Fairbanks Morse Co. .....Montreal
Canadian Steel Foundries, Ltd. ....Montreal
Dominion Equipment & Supply Co...Winnipeg
F. H. Hopkins & Co. .....Montreal
Mussens, Ltd. .....Montreal
A. O. Norton .....Coaticook, Que.
James Smart Mfg. Co., Ltd...Brockville, Ont.
Japans
The Dougall Varnish Co., Ltd. .....Montreal
Journal Bearings
Canadian Bronze Co. .....Montreal
Crossen Car Co. .....Cobourg, Ont.
Kerr Engine Co. .....Walkerville, Ont.
Jas. W. Pyke & Co. .....Montreal
Journal Boxes
The Holden Co., Ltd. .....Montreal
McCord & Co. .....Chicago, Ill.
Lager Beer, Etc.
E. L. Drewry .....Winnipeg
Lagging and Covering, Locomotive
Canadian H. W. Johns-Manville Co...Toronto
Taylor & Arnold .....Montreal
Lamps and Lanterns
F. H. Hopkins & Co. .....Montreal
The Hudson's Bay Co. .....
The Hiram L. Piper Co. .....Montreal
Lamps, Aro
Canadian General Electric Co. Ltd...Toronto
Northern Electric & Mfg. Co. ....Montreal
Lamps, Gas
Commercial Acetylene Co. .....Toronto
Safety Car Heating & Lighting Co...New York
Lamps, Incandescent
Canadian General Electric Co., Ltd...Toronto
Canadian Westinghouse Co....Hamilton, Ont.
Lathes
John Bertram & Sons Co. ....Dundas, Ont.
Canada Machinery Corporation ....Galt, Ont.
Mussens, Ltd. .....Montreal
Laths
J. Harrison and Sons Co...Owen Sound, Ont.
Lighting, Buoy
Safety Car Heating & Lighting Co...New York
Lighting, Car
Canadian Gold Car Htg. & Ltg. Co...Montreal
Commercial Acetylene Co. .....Toronto
Safety Car Heating & Lighting Co...New York
United States Light & Heat Co...New York
Lighting, Signal
Commercial Acetylene Co. .....Toronto
Lights, Contractors' and Wrecking
Dominion Equipment & Supply Co...Winnipeg
F. H. Hopkins & Co. .....Montreal
Mussens, Ltd. .....Montreal
Line Material
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L'Air Liquide Societe ..... Montreal
Locomotives, Compressed Air
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Montreal Locomotive Works .....Montreal
Locomotives, Contractors'
Dominion Equipment & Supply Co...Winnipeg
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Canadian General Electric Co., Ltd...Toronto
Montreal Locomotive Works .....Montreal
Locomotives, Logging
Canadian Locomotive Co. ....Kingston, Ont.
F. H. Hopkins & Co. .....Montreal
Locomotives, Rack
Canadian Locomotive Co. ....Kingston, Ont.
Montreal Locomotive Works .....Montreal
Locomotives, Steam
Canada Foundry Co., Ltd. .....Toronto
Canadian Fairbanks-Morse Co. .....Montreal
Canadian Locomotive Co. ....Kingston, Ont.
J. T. Gardner .....Chicago, Ill.
F. H. Hopkins & Co. .....Montreal
Montreal Locomotive Works .....Montreal
Vulcan Iron Works .....Wilkesbarre, Pa.
Lorries, Tracklaying
Cressen Car Co. .....Cobourg, Ont.
F. H. Hopkins & Co. .....Montreal
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Railway Asbestos Pkg. Co. ..Sherbrooke, Que.
Lubricators
Canadian Detroit Lubricator Co.....Windsor
McCord & Co. .....Chicago, Ill.
Taylor & Arnold .....Montreal
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J. Harrison and Sons Co...Owen Sound, Ont.
Parry Sound Lumber Co. .....Toronto
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M. Beatty & Sons .....Welland, Ont.
Canadian Fairbanks-Morse Co. ....Montreal
Dominion Equipment & Supply Co...Winnipeg
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F. H. Hopkins & Co. .....Montreal
Mussens, Ltd. .....Montreal
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Machines, Car Shop
John Bertram & Sons Co. ....Dundas, Ont.
Canada Machinery Corporation....Galt, Ont.
F. H. Hopkins & Co. .....Montreal
Machines, Cement
Jas. W. Pyke & Co. .....Montreal
Machines, Drilling
John Bertram & Sons Co. ....Dundas, Ont.
Canada Machinery Corporation....Galt, Ont.
Machines, Hoisting
Brown Hoisting Machinery Co.....Cleveland
Machines, Milling
John Bertram & Sons Co. ....Dundas, Ont.
Canada Machinery Corporation....Galt, Ont.
Machines, Planing and Shaping
John Bertram & Sons Co. ....Dundas, Ont.
Canada Machinery Corporation....Galt, Ont.
Machines, Radial Drilling
John Bertram & Sons Co. ....Dundas, Ont.
Canada Machinery Corporation....Galt, Ont.
Machines, Rail Drilling
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Machines, Slotting
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Tallman Brass & Metal Co...Hamilton, Ont.
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Canadian Bridge Co. .....Walkerville, Ont.
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xWhite Star [illegible] Steamer.

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Minnetonka	Dec. 14	Minnehaha	Jan. 4

Red Star
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Kroonland	Dec. 4	Finland	Dec. 18
Zeeland	Dec. 11	Vaderland	Dec. 25

White Star
New York—Queenstown—Liverpool

Celtic	Dec. 5	Baltic	Dec. 19
Cedric	Dec. 12	Megantic	Dec. 24

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By order of the Board.

G. C. CHISHOLM, Secretary.

Toronto, Nov. 20th, 1912.

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Positive Lock Washer Co. ....Newark, N.J.
Oakum
The Hudson's Bay Co. .....
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Can. Office & School Furniture Co.....Preston
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Dominion Equipment & Supply Co...Winnipeg
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Dominion Equipment & Supply Co...Winnipeg
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The Rail Joint Co. of Canada ....Montreal
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Dominion Iron & Steel Co. ....Sydney, N.S.
Drummond, McCall & Co. .....Montreal
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J. J. Gartshore .....Toronto
F. H. Hopkins & Co. .....Montreal
Rails for Relaying
J. J. Gartshore .....Toronto
F. H. Hopkins & Co. .....Montreal
Mussens, Ltd. .....Montreal
Jas. W. Pyke & Co. .....Montreal
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Franklin Railway Supply Co. ....New York
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Butterfield & Co. .....Rock Island, Que.
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Alexander Car Replacer Co...Scranton, Pa.
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Rope
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Chicago Railway Equipment Co.....Chicago
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Flannery Bolt Co. .....Pittsburgh, Pa.
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James Hutton & Co. .....Montreal
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Steel Shafting
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Steel, Nickel, for Nickel
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Canadian General Electric Co., Ltd...Toronto
Geo. C. Royce .....West Toronto, Ont.
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Switch Targets
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Goldschmidt Thermit Co. .....Toronto
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Ties
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F. H. Hopkins & Co. .....Montreal
Mussens, Ltd. .....Montreal
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The Holden Co., Ltd. .....Montreal
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Gentlemen: 1. Replying to your letter of August 26th, 1912, you are informed that the welded stern post of the steamer "Gen. Nathaniel Greene," which you repaired for this Department at New London, Conn., in 1907, is still in service on that vessel and giving satisfactory results.
2. It is general policy of this Department to not permit the publishing of any official reports upon commercial products or processes, but in this particular case there would appear to be no objection to your use of the foregoing statement of fact regarding the continued use during the past five years of the stern frame welded by you.
By direction. Respectfully,
(Signed) WILLIAM E. HORTON,
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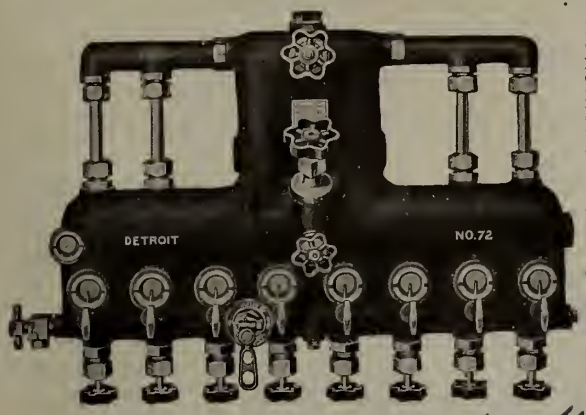

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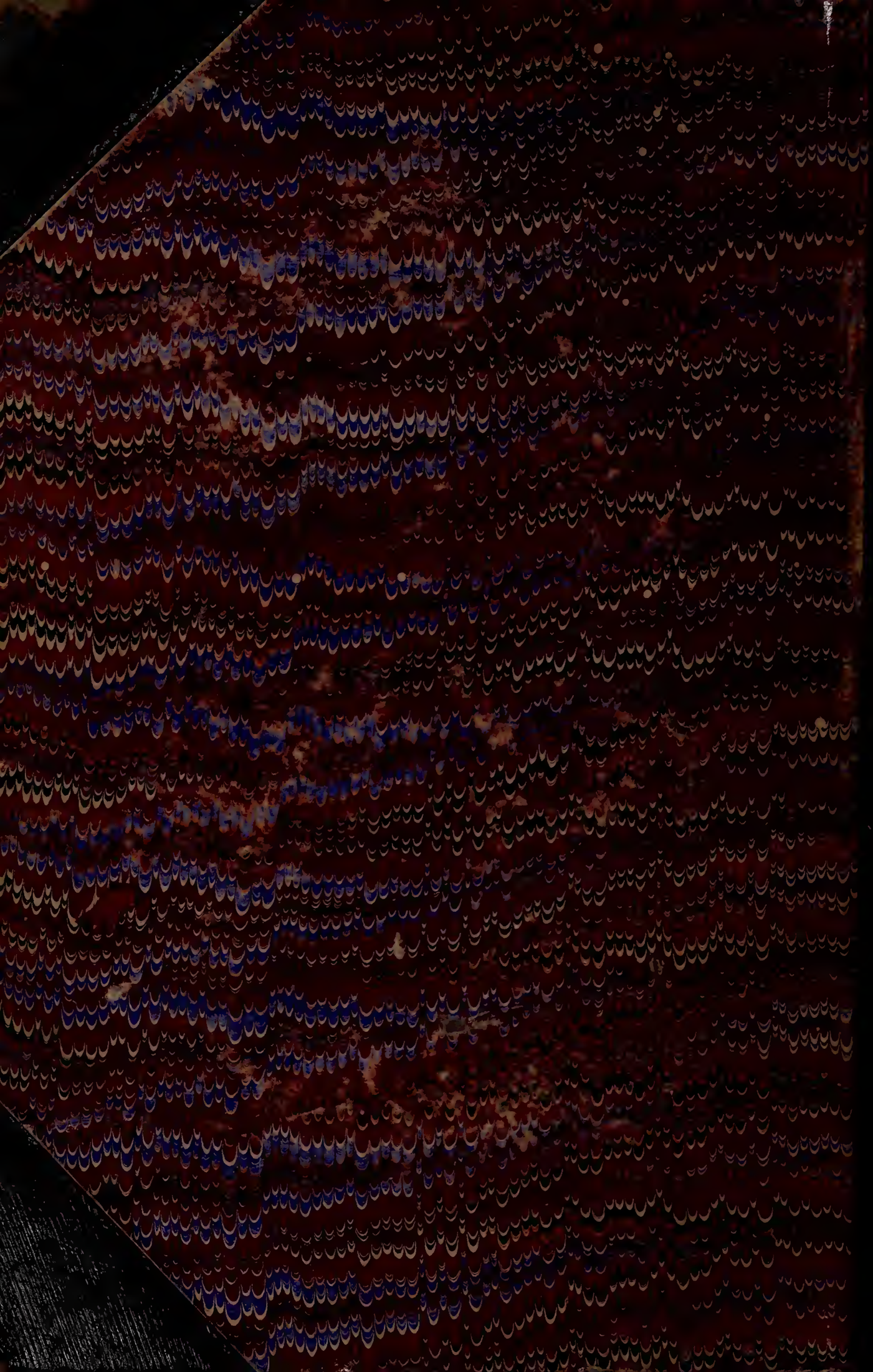
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